# INVESTIGATING THE INFLUENCE OF CANNABINOIDS ON MYOBLAST GROWTH AND DIFFERENTIATION

# THE EFFECTS OF CANNABIDIOL AND CANNABINOL ON C2C12 MYOBLAST PROLIFERATION AND DIFFERENTIATION

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#### LAY ABSTRACT

Nutrition impacts the regulation of skeletal muscle mass, with many individuals turning to supplements as a means to improve overall health. Cannabidiol – a constituent of the cannabis plant – has been used over the past several decades for its anti-inflammatory, neuroprotective, and anxiolytic properties; however, recent evidence has revealed its potential effectiveness in promoting muscle growth. If true, there is a possibility that it can be used to target the age-related loss of muscle mass, sarcopenia, or even improve athletic performance. Other derivatives, such as cannabinol, have seldom been studied but also demonstrate anti-inflammatory effects. Therefore, this thesis further elucidates the effects of cannabidiol and cannabinol on the myogenic signaling pathway. As a model, we used the murine C2C12 cell line that recapitulates the behaviour of human myoblasts. Interestingly, the data presented herein supports the notion that cannabidiol and cannabinol only promote cell growth and have no effect on myoblast maturation and myotube formation. These findings provide a better understanding of the potential for cannabidiol and cannabinol as a nutritional supplement targeting skeletal muscle.

#### ABSTRACT

Increasing interest has emerged in the field of nutrition and its role in promoting skeletal muscle growth. Recently, studies using both in vitro and in vivo models have suggested that cannabidiol - a constituent of Cannabis Sativa - can increase the growth and regenerative capacity of skeletal muscle stem cells. Other isolated compounds, such as cannabinol, have demonstrated anti-inflammatory effects in vivo. Due to the potential benefits of both compounds, our primary objective was to further elucidate the effects of cannabidiol and cannabinol on murine C2C12 myoblast proliferation and differentiation. We hypothesized that supplementation of cannabidiol and cannabinol would augment gene expression of myogenin, leading to enhanced myotube formation; as well as, induce greater gene expression of Myf5 and MyoD, accompanied by increased cell proliferation. In relation to skeletal muscle growth, myostatin and follistatin can substantially impact the regulation of hypertrophy; with down-regulation of myostatin being a potent stimulus for muscle growth, and follistatin being the antagonist to myostatin, we therefore examined if cannabidiol or cannabinol influenced these two proteins, as a possible rationale for increased myogenesis. In this study, cells were treated with either: (1) cannabidiol, (2) cannabinol, (3) or vehicle control (methanol). Cells were grown for 48 hrs in their respective media, the MTT assay was used to assess proliferation. Muscle differentiation experiments required cells to grow for seven days with media supplemented with the respective compound. The media was changed every 48 hrs. The extent of muscle differentiation was assessed via immunocytochemical and qPCR analysis. In preliminary experiments, cell proliferation was influenced by the duration of

which cells were exposed to the compound and concentration of the compound within the media. It was noted that changing growth media and compound every 24 hrs augmented the proliferative response compared to leaving it on for 48 hrs for both cannabidiol and cannabinol (p<0.05). Furthermore, supplementing cells with cannabidiol at a 1 or 5 uM concentration resulted in considerable cell growth compared to vehicle control (p<0.001). Cannabinol at 5 uM showed the same effect (p<0.0001). We also quantified the mRNA expression of genes involved in the myogenic regulatory pathway in proliferating and differentiating cells. Herein we report that using a 5 uM concentration of cannabidiol or cannabinol did not increase the expression of any of these genes in proliferating or differentiating cells. These findings help further characterize the effects of cannabidiol and cannabinol on the myogenic response.

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# LIST OF ABBREVIATIONS

SC	Satellite cells
CSA	Cross sectional area
MRF	Myogenic regulatory factors
n16	Cyclin-dependent kinase inhibitor
MSTN	Myostatin
GDF8	Growth and differentiation factor 8
TGF-R	Transforming growth factor beta
та	Tibialis anterior
DI3K	Phosphoinositide 3-kinases
	Protein Kingse B
mTOP	Mammalian target of ranamycin
TSC2	Tubarous Salarosis Complex 2
1502	Pibesomal Drotain S6
	Eukomotic translation initiation factor <i>I</i> E binding protain 1
4E-DF1	Eukaryouc translation initiation factor 4E-binding protein 1 Musele protein sumthesis
IVIT S ESTNI	Fallistatin
	Follistaun
ACI KIIB	Activity receptor type IIB
GDF-II	Growin differentiation factor 11
THU	
CBD	
CBN	
MS	Multiple sclerosis
IFN-y	Interferon Gamma
IL-17	Interleukin 17
PPARy	Peroxisome proliferator-activated receptor gamma
DMD	Duchenne muscular dystrophy
GCPR	G protein coupled receptors
CB1	Cannabinoid receptor 1
GPCR	G protein coupled receptors
cDNA	Complementary deoxyribonucleic acid
ADMETox	Absorption, distribution, metabolism, excretion, transport
Caco-2	Human colon carcinoma cell
TRPV1	transient receptor potential cation channel
RSV	Resveratrol
ERK	Extracellular signal regulated kinase
AMPK	AMP-activated protein kinase

#### DECLARATION OF ACADEMIC ACHIEVEMENT

For the contents of this thesis, it is prepared in the format outlined by the school of graduate studies, which includes an introduction, detailed methods, results and discussion section. During the project, Sean W. Lau was the principal contributor to completing experiments, data collection, data analysis and interpretation. Dr. Gianni Parise formed the vision of this project, and assisted with interpreting results. Finally, Dr. Sophie Joanisse and Dr. Jeff Baker helped with designing experimental methods and assay validation.

#### **INTRODUCTION**

#### *i. The Importance of Skeletal Muscle*

In adults, skeletal muscle accounts for ~40% of total body mass and is essential for physical movement, posture, and breathing<sup>1, 2</sup>. Its other roles, though less obvious, include regulating energy and protein metabolism throughout the body<sup>2</sup>. Undoubtedly, muscle has a critical influence on our self-preservation, yet a growing concern has been the age-related decline in muscle mass, otherwise known as sarcopenia<sup>1, 2</sup>. The consequences of sarcopenia can be severe, with many older adults facing a higher risk of physical disability, poor quality of life, and even death. Although the importance of muscle function is understood, the rate at which muscle quality declines with aging can be severely underestimated. It has been shown that by the seventh and eighth-decade of life lean muscle mass can decrease to 25% of total bodyweight<sup>119</sup>, with further evidence revealing that in the lower body, such as the vastus lateralis, muscle mass can decrease by 40% between the ages of 20 and 80 years<sup>120</sup>. Even with the benefit of 'healthy aging', individuals still suffer from declining muscle quality due to deterioration of fibre structure, mechanics, and function<sup>16</sup>. When comparing muscle biopsies from healthy active men between 15-83 years of age, it was apparent that there was a greater reduction in overall number of muscle fibres and cross-sectional area (CSA) of older men, type II fibers were particularly affected and were accompanied with more fat and connective tissue<sup>3</sup>. Multiple groups have examined the impact of age on muscle strength. There is a decline in isometric and isokinetic contractions of 20-40% in the knee extensors for those in the seventh and eighth decade of life, while those in the ninth decade experienced an

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even greater loss of 50% or more<sup>4, 5</sup>. The impact of declining muscle mass in the elderly should not be underestimated. In Canada alone, the economic cost from complications of seniors falling due to a lack of muscle function is two billion dollars annually<sup>6</sup>. Therefore, it is crucial that interventions are identified for ameliorating muscle wasting with advancing age. An area of growing interest is the effectiveness of supplements on improving the myogenic pathway, which can be applied to the progressive onset of age-related muscle loss.

#### ii. Role of Satellite Cells

Since their discovery in 1961, satellite cells (SC) have been shown to be indispensable for muscle regeneration and remodelling, especially after exercise, trauma, or disease. SC function is dependent on the expression of Pax 7, Myf5, MyoD, Mrf4, and Myogenin, collectively known as the myogenic regulatory factors (MRFs)<sup>22, 23, 24</sup>. Typically, within postnatal muscle, SCs reside in a 'quiescent' state in which they are dormant and express the genetic marker Pax7+<sup>25</sup>. In the event of exercise or traumatic injury, it has been shown that an up-regulation of transcription factors Myf5 and MyoD initiates the progression of SC through the myogenic program. Subsequently, SCs divide and proliferate, either to self-renew or fuse onto existing myofibers or each other to form nascent myotubes. Differentiation requires the expressions of Myogenin and Mrf4<sup>26, 27</sup>. With differentiation, myoblasts fuse to existing myofibers and contribute to the repair and regeneration of muscle. Collectively, the up- and down-regulation of the MRFs are essential for the proper function of SCs. Therefore, myogenic regulators should be investigated when exploring pathways for improving muscle growth and regeneration.

It has been hypothesized that the decreased activity of SCs observed with aging contributes to the onset and progression of sarcopenia<sup>17</sup>. Other identified factors include a reduction in the rate of protein synthesis<sup>7, 8</sup>, decreased innervation of muscle fibers<sup>9, 10</sup>, loss of mitochondrial function<sup>11, 12, 13</sup>, and nuclear apoptosis<sup>14, 15</sup>. The reality is that sarcopenia occurs due to a multitude of factors including a failure of the SC population. SCs present an interesting case in that they are the precursors to muscle fibers and considered to be the primary (or only) contributor of new myonuclei to skeletal muscle fibres<sup>16</sup>, making them an ideal target for therapeutic solutions to mitigate muscle loss. Mounting evidence suggests that SC content decreases in skeletal muscle with advancing age. In a study by Verdijk and colleagues (2014), it was reported that with advancing age, not only were type II muscle fibers substantially smaller but aging was also accompanied by a reduction in type II SC content<sup>17</sup>. In addition, it should be noted that from birth to adulthood, there are no considerable changes to the muscle fibre type and SC content<sup>17</sup> suggesting the decline occurs with advancing age. Others have also found a link between SCs and muscle wasting. Brack and colleagues (2005) revealed that a decrease in SC content led to muscle fibre atrophy<sup>18</sup>. This was determined by the initial understanding that muscle fibres are composed of myonuclei, which govern a predetermined area of cytoplasm, referred to as the myonuclear domain<sup>150</sup>. Based on this theory, they noticed that the nuclei/unit length in aging muscles decreases in larger fibers. In parallel, SC content also declines with age, causing a decrease in fibre size to

compensate for the standard myonuclear domain range<sup>18</sup>. In relation to SC content and strength, Verdijk and colleagues (2010) examined muscle biopsies, as well as leg strength from older men (<65 yrs), and demonstrated a strong correlation between muscle mass and strength with overall SC content and fibre CSA<sup>19</sup>.

Besides overall SC number, deficiencies in SC function are also believed to strongly impact the onset of sarcopenia. It is well established that older adults have an impaired recovery of muscle mass and strength after an acute bout of immobilisation compared to young adults<sup>121, 140</sup>. However, the underlying cellular mechanisms that lead to impaired recovery with aging remain unknown. Suetta and colleagues (2013) were able to further elucidate the dysfunction by analysing the expression of MRFs in healthy young and old males following leg immobilization for two weeks and retraining for four weeks. It was reported that even with re-training, older males had no detectable gains in myofiber area (MFA) or SCs, whereas younger males increased their MFA and had more SC per type II fibre. The impaired muscular recovery in seniors noted by Suettta and colleagues may be attributed to an impaired response in SC proliferation<sup>20</sup>. A study done by Sousa-Victor and colleagues (2014) compared SC function of young, old and geriatric mice. It was apparent that SCs from geriatric mice lost the ability to transition out of quiescence and entered an irreversible senescent state, caused by the de-repression of p16INK4a, ultimately reducing regenerative and self-renewal capacities. Remarkably, even with injury, these cells were unable to activate and expand, while further accelerating towards full senescence<sup>21</sup>. Overall, these studies provide evidence that either

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SC content or function can have an impact on the age-related decline in muscle mass and strength.

#### iii. Myostatin and Muscle Growth

Myostatin (MSTN) – also known as growth/differentiation factor 8 – is a protein found within the transforming growth factor beta (TGF- $\beta$ ) superfamily that has the ability to highly regulate muscle mass in animals and humans. For this reason, it has garnered considerable interest as a target for pharmacological interventions. A wealth of literature has shown that the decreased expression of MSTN can promote significant muscle growth, while overexpression can lead to muscle atrophy<sup>28, 29</sup>. To determine the regulatory effects of MSTN on cellular pathways, the application of cell culture techniques have been commonly used in studies as physiologically accurate and reliable models. In 2000, Thomas and colleagues presented early evidence that MSTN functions by controlling the proliferation of muscle precursor cells<sup>141</sup>. In their findings, incubation of MSTN led to decreased proliferation of murine myoblast cells, which stemmed from cell cycle arrest in the G1 phase<sup>141</sup>. Further analysis indicated that MSTN specifically upregulated p21 – a cyclin-dependent kinase inhibitor – and decreased the level and activity of Cdk2 protein in myoblasts<sup>141</sup>. A few years later, the same cell model was used to further examine MSTNs influence on the regulation of MRFs<sup>142</sup>. It was discovered that increasing concentrations of recombinant MSTN repressed protein levels of MyoD, Myf5, myogenin, and p21, which was mediated by the protein Smad-3, leading to the inhibition of myogenic differentiation<sup>142</sup>. On the other hand, the inhibition of MSTN in cultured SCs results in an in increase myotube formation, indicating its vast influence on

myogenesis<sup>143</sup>. Indeed, MSTN has a powerful impact on regulating skeletal muscle mass, which is apparent in gene knockout models of numerous animals. Specifically, Welle and colleagues (2007) demonstrated that reducing MSTN mRNA expression by less than 1% in mice resulted in ~25% increased skeletal muscle mass within 3 months<sup>30</sup>. Remarkably, this genetic mutation can also occur naturally and has produced hyper-muscular phenotypes in mice, sheep, dogs, humans, and some cattle breed<sup>32, 33, 34, 35, 36</sup>.

It has been suggested that endogenous levels of MSTN may influence the prevalence of sarcopenia<sup>37, 38</sup>, however, the method of measuring MSTN concentration is complex, and there are various studies showing mixed results on the topic<sup>39, 40, 41</sup>. Research in support of this theory demonstrates that older adults exhibiting a decline in muscle mass have an up-regulation of MSTN protein in blood when compared to younger subjects<sup>42, 43, 44</sup>. Indeed, further examination was merited on the pathways linked to this negative-regulator of muscle mass. McKay and colleagues (2012) reported a link between MSTN and SCs after a bout of resistance exercise. Specifically, at baseline the number of SCs colocalized with MSTN was not different between old and young men, however, 24 hrs after a single bout of unilateral loading the proportion of type II fibre-associated SC colocalized with MSTN was 67% higher in older men. This was accompanied by a severely blunted progression of SCs through the myogenic program, suggesting that the increased colocalization of MSTN in SCs induced impairment in myogenic capacity of aged muscle<sup>44</sup>. It has also been suggested that the inhibition of MSTN may have protective qualities in aging animals experiencing muscle wasting. In 2006, Siriett and colleagues were able to show that old MSTN-null mice had reduced age-related muscle

loss than their wild-type counterparts. These mice expressed little to no fibre type shifting and minimal atrophy, whereas old wild-type mice showed a greater transition to oxidative fibre types, as well as more atrophy<sup>45</sup>. Taken together, the above findings illustrate MSTN as a critical regulator of the myogenic process and can be a beneficial target for increasing muscle mass.

#### iv. Follistatin and Muscle Growth

Follistatin (FSTN) is a protein that has emerged as an active antagonist to the upregulation of MSTN. Its expression can be found in nearly all tissues within the body where it binds and neutralizes numerous members of the TGF- $\beta$  superfamily<sup>47, 48</sup>. Likewise, FSTN has a strong affinity for MSTN and is capable of binding and preventing downstream MSTN signalling<sup>121</sup>. The functional significance of this protein was determined using transgenic mice that expressed high levels of MSTN, compared to ones injected with FSTN cDNA<sup>49</sup>. After analysing protein regulation, it was concluded that FSTN binds onto the C-terminal dimer of MSTN and inhibits its ability to bind to receptors, resulting in a dramatic increase of muscle mass even compared to MSTN-null mice<sup>49</sup>. Furthermore, when FSTN over-expressers were crossed with MSTN knock out animals there was an additive effect on muscle mass with a quadrupling of muscle mass. Together, the results demonstrate that FSTN inhibits MSTN, but also influences other pathways regulating muscle mass. In summary, FSTN possesses potent myostatin inhibiting characteristics that can have a powerful influence on muscle regeneration and growth.

#### v. The variability in response to supplements

Nutritional supplements are an efficient and easy dietary additive for individuals looking to improve overall health. Supplements are sold in seemingly endless forms and compositions with the added factor that they can be specific for age, gender, and athletes<sup>58</sup>. For many, it can be challenging to determine the extent of which these products are beneficial, primarily because of the potentially small effect supplements may give off <sup>62</sup>. There are supplements in the market, such as whey protein, that have shown to be effective in improving the rate of growth of skeletal muscle following feeding and exercise<sup>128, 129, 130, 131</sup>. Yet, other compounds commercialized for the same purpose, like BCAAs or testosterone, show insufficient data or have no myogenic effect at all<sup>125, 126, 127</sup>. It is understandable that such discrepancy exists in over the counter supplements. Within Canada, the requirements for monitoring and evaluating natural health products are loosely regulated and considered by the natural health regulations as low-risk products<sup>63</sup>, without a priority on efficacy. In comparison to pharmaceutical products, these guidelines require minimal evidence to support their statements and can often have little to no experimental research to support their claims<sup>63</sup>. There is a significant number of individuals taking supplements, with estimates that  $\sim 45\%$  of the population in Canada use at least one supplement a year<sup>57</sup>, which has been a growing trend during the past few decades<sup>124</sup>. This progressive rise in the use of supplements can be attributed to a number of factors including an aging population of 'baby boomers' concerned over their wellness and health, as well as a growing cohort of older adults experiencing chronic illness<sup>58</sup>. Be

it as it may, there are a considerable number of individuals consuming supplements to better their health, but may not be receiving any benefits at all from these supplements.

#### vi. Overview of Cannabinoids

In the past decade, cannabinoid chemistry and pharmacology have become increasingly prevalent in research and have been the focus of thousands of publications. To this day, researchers determined there are over 110 different phytocannabinoids isolated from the plant *Cannabis Sativa*<sup>65</sup>; most of them, are similar in chemical structure but exhibit various physiological responses when consumed<sup>132</sup>. Out of its many constituents,  $\Delta$ 9-tetrahydrocannabinol (THC) is the most recognized due to its popularity in eliciting euphoric effects, leading many to believe it is the only factor responsible for the effects of cannabis. However, mounting evidence has proven other isolated components of the plant can provide therapeutic effects, such as anti-inflammatory <sup>66, 67</sup>, neuroprotective<sup>68</sup>, and anxiolytic properties<sup>69, 70, 71</sup>. Indeed, cannabidiol (CBD) – a nonpsychoactive compound – has gained considerable interest for its ability to regulate muscle regeneration and growth. Specifically, it was shown by Giacoppo and colleagues (2016) that CBD has a positive effect on the Akt/mTOR pathway in mice with experimental multiple sclerosis (MS). In their study, CBD (10mg/kg) was administered for 14 days after the symptoms of MS started to appear<sup>72</sup>. Evidently, mice that had symptoms of MS and were treated with CBD showed significant up-regulation of PI3K/Akt/mTOR proteins compared to their wild-type counterparts<sup>72</sup>. Further evidence also revealed that the administration of the compound caused a greater potential for

muscular recovery by reducing pro-inflammatory cytokines, such as IFN-y, IL-17, and increasing PPARy<sup>72</sup>. With the current understanding that the mTOR complex plays a pivotal role in promoting muscle protein synthesis (MPS), it can be hypothesized that through its increased activation there may also be an enhanced myogenic response. In addition, other studies have found a significant effect of CBD on muscle regulation using murine C2C12 myoblasts, primary SCs, as well as myoblasts from healthy and duchenne muscular dystrophic (DMD) patients<sup>73</sup>. Their comprehensive investigation revealed CBD as a promoting factor for differentiation in C2C12s and myoblasts isolated from healthy and DMD donors<sup>73</sup>. It was discovered that the underlying mechanisms centralized around an increase in calcium uptake through the transient receptor potential channels, providing further evidence of the potential structures that CBD targets<sup>73</sup>. In dystrophic mice, the administration of CBD (60mg/kg) helped prevent the loss of locomotor activity, reduced inflammation, and restored autophagy, commonly associated with the disorder<sup>73</sup>. In contrast to the wealth of knowledge surrounding CBD, cannabinol (CBN) - a mildly psychoactive cannabinoid found in trace amounts $^{147}$  – has been seldom studied. Although little is known about CBN, one study demonstrated its physiologically therapeutic capabilities that could potentially enhance regeneration of muscle. Using the carrageenan induced paw edema model – a popular test used for screening anti-inflammatory activity - it was reported that CBN was effectively able to reduce collagen-induced arthritis in rat models<sup>148</sup>. While more research is still needed on the functional relevance of CBN, it would be interesting to examine its influence on myogenic regulation.

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It was revealed recently that the biochemical reactions involved around cannabinoids are primarily through receptors found on cell membranes<sup>74, 75</sup>, which are known as G Protein Coupled Receptors (GCPRs). These are classified as either CB1 or  $CB_2$  and can be found in various concentrations throughout the body<sup>75</sup>.  $CB_1$  has proven to be the most widely expressed receptor protein and is present in several regions of the brain, such as the cerebellum, hippocampus, basal ganglia, amygdala, hypothalamus, and brainstem<sup>144</sup>. In addition to the brain, CB<sub>1</sub> is also highly expressed in the peripheral nervous system and in most mammalian tissues and organs (i.e. heart, liver, adipose tissue, lungs, skeletal muscle)  $^{144}$ . The activation of CB<sub>1</sub>, either by natural or synthetic ligands, has been reported to influence a host of homeostatic functions, some of which include: regulating the psychoactive potential from exogenous cannabinoids<sup>76, 130</sup>, modulating the mobility of the GI tract<sup>144</sup>, or increasing permeability of the intestinal epithelium<sup>144</sup>. In contrast to the abundant expression of CB<sub>1</sub>, CB<sub>2</sub> receptors are reported to have a lower quantity by up to 100-fold<sup>145</sup>, due to its rarity, on-going research is continuously finding new locations of the receptor. Currently, literature has proposed that CB<sub>2</sub> is predominantly expressed in cells associated with the immune system, and in other peripheral tissues, including the cardiovascular system, GI tract, liver, and adipose tissue. Because no CB<sub>2</sub> receptors are found in the CNS, it is referred to as "the peripheral cannabinoid receptor"<sup>144</sup>. Their reaction to binding endocannabinoids under various pathological conditions or disease states appears to give off immunosuppressive properties such as anti-inflammatory signals<sup>77</sup>. Interestingly, exogenous CBD has little affinity for either of the cannabinoid receptors but acts through various receptor-

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independent pathways such as TRPV1 and serotonin receptors<sup>73, 133, 134</sup>. On the other hand, CBN has been noted to act as a partial agonist at the CB<sub>1</sub> receptors with even higher affinity to CB<sub>2</sub> receptors<sup>149</sup>. Naturally, scientists have found endogenous cannabinoids that activate both CB<sub>1</sub> and CB<sub>2</sub> receptors via paracrine signalling and serve as intercellular 'lipid messengers'<sup>78</sup>. A unique feature of these endogenous cannabinoids is their ability to exist as precursors on cell membranes, which can be cleaved by specific enzymes when needed<sup>79, 80, 81</sup>. Compared to other neuromodulators, this form of synthesis allows for signalling to occur on demand rather than made and stored for later use<sup>79, 80, 81</sup>. Their production involves a variety of physiological functions, including appetite, pain sensation, mood, and memory<sup>82</sup>, making this system valuable for drug and therapeutic research. Overall, cannabinoid receptors can influence cells in a variety of ways, and CBD has demonstrated its unique potential to limit muscle degeneration that may truly benefit human health.

#### vii. The Significance of Cell Culture Research

Since the advancement of cell culture techniques in the 1950s, it has become increasingly prevalent in biological experiments, especially as it is applied to human health. Through its application, there have been ground-breaking discoveries for viral vaccines, monoclonal antibodies, and recombinant therapeutic proteins<sup>83</sup>. Indeed, cell culture is a physiologically reliable model that can be used for investigating the biophysical and biomolecular mechanisms in cell and drug therapy. Its significance has been shown in determining the effectiveness of drug absorption, distribution, metabolism,

excretion, and toxicity (ADMETox)<sup>135</sup>. Countless studies have used various cell types grown in a 2D model to investigate the different aspects of ADMETox. For instance, the human colon carcinoma cell (Caco-2) has been commonly used to predict intestinal drug permeability and absorption in humans<sup>84</sup>. Cultured Caco-2 cells express distinct characteristics of intestinal epithelium, such as brush border microvilli, dome formation, and tight bonds amongst each other<sup>84, 85</sup>. Furthermore, these cells produce proteins capable of transporting chemical substances, making them also well suited for testing drug transport<sup>86</sup>. In relation, Alhamoruni and colleagues (2010) were able to determine the intestinal permeability of CBD using the caco-2 cell model. Permeability was measured using transpithelial electrical resistance, with potential target sites such as the  $CB_1$  and  $CB_2$  receptor, TRPV1, PPAR $\gamma$ , PPAR $\alpha$ , and other proposed cannabinoid receptors. By using ethylenediaminetetraacetic acid to increase abnormal levels of permeability, CBD was able to provide relief to the high rate of permeability, suggesting that it may have therapeutic potential for highly permeable intestinal epithelium<sup>87</sup>. Other cells, such as the Madin-Darby Canine Kidney, have an interesting capacity of releasing P-glycoprotein, a plasma membrane protein that acts as a drug transport mechanism by exporting drugs out of cells, which decreases the intracellular concentration and provides faster results in drug transport assays<sup>88</sup>. In similar cases, many researchers have found that the immortalized cell line HepG2 – derived from primary hepatocytes – can accurately test drug metabolism and toxicology before beginning clinical trials<sup>89</sup>. Its application has been crucial for detecting drug-induced liver injuries while also being termed the gold standard for xenobiotic metabolism and cytotoxicity

studies<sup>136</sup>. In a revision of toxicity testing done by the U.S National Research Council, it has been calculated that out of the 51 drugs taken out of distribution, 29 were withdrawn due to hepatotoxicity and cardiotoxicity in HepG2 cell models<sup>137</sup>, demonstrating its applicability for identifying risk assessment. Overall, these cellular assays are examples of the significant impact cell culture may have on drug screening and development, as well as its vast experimental capabilities.

Most mammalian cell culture uses either primary or established cell lines grown in a suitable culture vessel with media. The origin of primary cells are directly isolated from either tissue or cell suspension and have limited growth before reaching senescence<sup>83</sup>. This 'biological clock' is attributed to chromosomal length, which was noted by Cooke & Smith in 1986; their study reports unequal caps, also known as telomeres, at the end of chromosomes in human germline cells compared to somatic cells. These were later determined to be repeats of the nucleotide sequences that became shortened after each stage of proliferation<sup>90</sup>. In light of this, scientists were able to find a solution by transforming primary cells into a continuous cell line; whereby, cells would proliferate indefinitely. Currently, there are various techniques that can be used to develop an immortalized cell line, including mutagens, viruses, or oncogenes<sup>91</sup>. As a result, numerous established cell lines exist today using different cell types (i.e. fibroblasts, myoblasts, epithelial cells), with the additional benefit that they can be grown in twodimensional (2D) or three-dimensional (3D) models. Cells in 2D, are plated as a monolayer, primarily using a petri dish or culture flask<sup>113</sup>. Advancements in biotechnology have produced 3D models that can grow cells in multiple ways, including:

forced floating<sup>92</sup>, hanging drop<sup>93</sup>, agitation-based approach<sup>94</sup>, matrices<sup>95</sup>, scaffolds<sup>96</sup>, and microfluidic platforms<sup>95</sup>. Comparing the two, there is a debate on which provides greater physiological relevance, albeit more literature has supported 3D models<sup>97</sup>. Karlson and colleagues (2012) were able to further examine the differences, by using colon cancer cells (HCT-116) either grown as 3D spheroids or in monolayer. Their application of six standard anti-cancer drugs showed that cells in 2D had an extremely high response, which was unfeasible if used in vivo. Meanwhile, cells in 3D spheroids had a blunted response from the treatment, which was comparable to its administration in humans<sup>98</sup>. There are several explanations why this model may better predict results in *vivo*. It has been shown that a limited diffusion of compounds through the spheroid can better imitate features of solid tissue, while also fluctuating the availability of oxygen, nutrients, metabolites, and signaling molecules<sup>98</sup>. Additionally, the 3D model can provide cell-cell and cellenvironment interactions responsible for cellular decision-making<sup>98</sup>. These characteristics of a 3D model give results more validity, although, others have also proposed that 2D cell culture can be more relevant than its counterpart. It was Ikeda and colleagues (2017) that studied the contractile force generation of tissue-engineered skeletal muscle using C2C12 myotube differentiation in 2D and 3D models. They found the levels of contractile force within cells grown in 3D were not correlated with levels from skeletal muscle constructs<sup>100</sup>. On the other hand, sarcomere function and contractile activity of those in 2D cell culture showed significant resemblance<sup>100</sup>. Therefore, careful consideration should be made into the specific cell model used during experimental application.

Assays have been developed to determine the effectiveness of nutritional compounds in both 2D and 3D models. These methods are evident in a study by Monesano and colleagues (2013), with the evaluation of resveratrol (RSV) on proliferation and differentiation of murine myoblasts. Using immunoblotting analysis, they determined that RSV promotes myogenesis and hypertrophy by influencing protein synthesis and MRFs protein expression. Specifically, RSV was shown to stimulate the IGF-1 signalling pathway, by increasing AKT and ERK 1/2 protein activation, as well as AMPK protein abundance, and decreased the gene expression of myogenic markers Myf-5 and MyoD<sup>101</sup>. RSV a natural polyphenol found in grapes and other fruit is believed to provide immune regulation, DNA repair, cancer chemoprevention, cardio, and neuroprotection<sup>101</sup>; however, it has not been known to increase myogenesis until this investigation. Therefore, cell culture has its role in laying the foundation for in vivo experiments and is one of the major tools used in cellular and molecular biology. These examples provide a small glimpse at the capability of testing nutritional compounds, which can further be elucidated in animal and human trials.

#### viii. Physiological Relevance of Murine C2C12 Myoblasts

A common model used for exploring myogenesis and the expression of target proteins is the immortalized C2C12 cell line. As a subclone of mouse myoblasts, they are capable of rapid proliferation and maturation into functional skeletal muscle, making them ideal for investigating the effects of CBD on myogenesis<sup>113</sup>. Yaffe and Saxel (1977) reported that within four days of differentiation, multinucleated myotube networks formed, and a few days later, sarcomeres and z-lines could be seen<sup>102</sup>. These physiological structures formed by C2C12s help provide an accurate representation of skeletal muscle found in humans. Other studies have noted that C2C12s express myofilament proteins important for muscle contractions, these include: slow-twitch skeletal muscle, embryonic and perinatal myosin heavy chain isozymes<sup>103</sup>, slow and fasttwitch troponin I isoforms <sup>104</sup>, cardiac muscle troponin C isoforms<sup>105, 106, 107</sup>, and striated muscle tropomyosin<sup>110</sup>. Altogether, these findings imply that C2C12s are reliable for assessing the biomolecular and biophysical effects of CBD and CBN. Modifications can also be made to C2C12s for experimental purposes. To identify hypertrophy-inducing agents for the treatment of sarcopenia, Cross-Doersen & Isfort (2003) refined the cell model by fusing  $\beta$ -myosin heavy chain gene regions to a luciferase reporter gene. This resulted in a cell capable of expressing hypertrophic agents seen in skeletal muscle, including insulin, IGF-1, and testosterone, for both proliferative and differentiated states<sup>111</sup>. These abilities to modify the cell line help to better understand the hypertrophy inducing process, while also demonstrating the various applications of C2C12s.

There are advantages and disadvantages when using an established cell line instead of primary cells. Careful consideration should be made when selecting cell types (C2C12 or primary myotubes) for the experiment in question. Myotubes derived from primary cells show a higher assembly of sarcomeres and contractile activity<sup>112</sup>. In addition, they express higher levels of structural components within muscle tissue such as myosin heavy chain, cytochrome C oxidase IV, and myoglobin<sup>112</sup>, suggesting its enhanced genetic integrity, and ability to exhibit normal physiological structure and

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function. However, primary cells can produce greater variability in experiments due to differences in donors, as well as the added difficulty of harvesting cells<sup>113</sup>. They are also hard to maintain with the need to optimize specific culture conditions and slower cell growth, making large-scale experiments unlikely<sup>113</sup>. Moreover, as mentioned earlier, primary cells have a limited lifespan and will reach senescence after a certain number of cell divisions. On the other hand, C2C12s are capable of proliferating indefinitely with a high rate of consistency and have well-established conditions for growth. Other advantages include their fast proliferation rate and relatively low cost, allowing for higher data throughput<sup>113</sup>.

#### ix. Study Objective and Hypotheses

The purpose of this investigation was to evaluate the effects of CBD and CBN on proliferation and differentiation using the murine myoblast C2C12 immortalized cell line. In doing so, we aimed to determine whether CBD or CBN could impact skeletal muscle growth in hopes of translating these results to *in vivo* models for improving athletic performance or prevent age-related muscular diseases such as sarcopenia. Based upon previous literature<sup>72, 73, 146</sup>, we hypothesized that CBD and CBN can augment the expression of Myogenin, leading to significant myotube formation; as well as, increase gene expression of Myf5 and MyoD, accompanied by significant cell proliferation. In relation to skeletal muscle growth, MSTN and FSTN have a substantial impact on the regulation of hypertrophy <sup>30, 33, 34, 49, 50</sup>, we therefore sought to determine if CBD or CBN can influence these two proteins, as a possible rationale for increased myogenesis.

#### **METHODS**

#### Cell Culture and Reagents

Murine C2C12 myoblasts (cat. n. CRL-1772; ATCC: The Global Bioresource Centre) were cultured in a growth medium (GM) composed of Dulbeco's Modified Eagle Medium (DMEM) High Glucose 1x (cat. n. 11995093; Invitrogen) supplemented with 10% Fetal Bovine Serum (FBS) Gibco (cat. n. 12383020; Invitrogen), and 1% penicillin/ streptomycin (cat. n. 15140122; Invitrogen). Proliferating C2C12s were induced into differentiation by exposure to differentiation medium (DM), DMEM containing 2% Horse Serum (cat. n. 16050122; Invitrogen), and 1% penicillin/streptomycin. Depending on the experiment, CBN solution (cat. n. C-045-1ML; Sigma-Aldrich), CBD solution (cat. n. C-045-1ML; Sigma-Aldrich), or Methanol (cat. N. CABDH1135-4LP; VWR) were supplemented into the media. With all media listed above being filtered using Corning Disposable Vacuum Filter/Storage (cat. n. 28199-784; VWR).

#### General cell culture methods

C2C12 myoblasts were thawed and placed in a falcon tube containing 10ml of GM, then centrifuged at 1500 rpm for 5 min at 20°C<sup>158</sup>. Next, supernatant was aspirated and the cells were resuspended in GM and pipetted onto a cell culture plate<sup>158</sup>. All cells grew in an incubator at 37°C and 5% CO2<sup>158</sup>. In the event that cells needed to be passaged, trypsin 10x solution (cat. n. 15090046; Invitrogen) diluted to 1X with PBS was pre-warmed to 37°C, then GM was removed from the plate and cells washed twice in PBS and 1X trypsin was added (0.5 ml/10cm<sup>2</sup>)<sup>159</sup>. Afterwards, the cells were incubated at

37°C for 5 minutes and GM was re-added to deactivate trypsin<sup>159</sup>. The cell suspension was transferred to a tube and centrifuged at 1500 rpm for 5 minutes<sup>159</sup>. After removal of the supernatant, the cell pellet was resuspended in GM and plated onto a dish at the desired cell density<sup>159</sup>. Cell counting involved using the Invitrogen Countess I automated cell counter machine, as well as cell counting slides (cat. n. 10027-446; VWR) and Trypan blue dye (cat. n. 15250061. Fisher Scientific); to perform this test, 10ul of cells combined with 10ul of Trypan blue were mixed together then placed into the well of the slide and placed into the counter<sup>160</sup>. For differentiation experiments, cells needed to grow until 80% confluent then differentiation media (DM) was added and/or changed every 48 hours for 7 days<sup>158</sup>.

#### Cell Proliferation Assay

To assess myoblast proliferation, cells for the MTT assay were plated on a 96 well plate at a density of 1500 cells/well. Quantification of cell growth was determined using an immunofluorescence proliferation assay with a tetrazolium dye known as MTT 3-(4,5-dimethlythiazol-2-yl)-2,5-diphenyltetrazolium bromide<sup>157</sup>. Usage of Yellow MTT theoretically assesses the increase in the number of cells via mitochondrial quantity– i.e. a greater number of cells can convert more yellow MTT to purple formazan through the mitochondria – which has been analysed using the MTT stock solution, 1mL of sterile phosphate buffered saline (PBS) was added to a 5mg vial of MTT, and then dissolved by vortexing<sup>157</sup>. The timeline for the proliferation assay is as follows: cells were added onto a 96 well plate. 24 hours later the media was changed to GM + compound (CBD, CBN or

methanol). On the third day 20ul of 5mg/ml MTT was pipetted into each well – one row of wells having MTT but no cells (control) <sup>157</sup>. The plate was incubated for 3 hours at 37°C in a culture hood, media was removed and 150ul of MTT solvent was added<sup>157</sup>. The culture plate was covered with tin foil and placed on an orbital shaker for 15min<sup>157</sup>. Finally; absorbance was measured on the Synergy<sup>TM</sup> Mx (serial n. 267174; Biotek) at 590nm with a reference filter of 620nm. To determine if incubation time using GM + compound influenced cell growth, a time course experiment was run whereby three separate groups were incubated for 48 hrs as follows: (1) GM + compound for 8 hrs, then replaced with regular GM (2) GM + compound changed every 24 hrs (3) GM + compound remained on for 48 hrs (*see diagram 2*). For qPCR experiments, cells were added onto 6 well plates at 50 000 cells/well with a replicate for each sample. When ~40% confluent, media was changed to GM + compound (CBD, CBN or methanol) for each well at a 5 uM concentration (*see diagram 1*).



**Diagram 1:** diagram of the concentration experiments for proliferating cells



Diagram 2: diagram of the time course experiments for proliferating cells

#### Cell differentiation assay

For differentiation, cells were plated onto 6 well plates at 100 000 cells/well with a replicate for each sample. C2C12 differentiation required cells to grow at a minimum confluence of 80% on the culture dish before switching to DM. 24 hours later after changing GM to DM (Day 1), DM + compound (CBD, CBN or methanol) was added and changed every 48 hours for a total of 7 days. On the final day immunocytochemical protocols or RNA isolation was completed *(see diagram 3)*.

80% cor	% cell Ifluence							
Day	0 Da	ay 1 Da	ay 2 Da	y 3 Day	y 4 Da	iy 5 Da	ay 6 Day	7
,		, ,		, ,		, ,		,
	DM	DM + MTH 1, 5 uM		DM + MTH 1, 5 uM		DM + MTH 1, 5 uM		Collect RNA/Stain
	DM	DM + CBD 1, 5 uM		DM + CBD 1, 5 uM		DM + CBD 1, 5 uM		Collect RNA/Stain
	DM	DM + CBN 1, 5 uM		DM + CBN 1, 5 uM		DM + CBN 1, 5 uM		Collect RNA/Stain

**Diagram 3:** diagram of differentiation timeline using different concentrations and compounds



**Diagram 4:** diagram of a 6 well plate used for both proliferation and differentiation qPCR/immunocytochemistry experiments

#### Immunofluorescence assay and analysis

With immunofluorescent analysis, MHCI (cat. n. BA-F8-s; University of Iowa) was used to detect myotubes and DAPI (cat. n. D9542-10MG; Sigma Aldrich) to detect nuclei. The staining protocol was as follows: myotubes were fixed on a culture plate with 4% PFA for 30 minutes, then washed with PBS for 3 x 5 minutes. The PBS was removed and 0.1% Triton X in 1% BSA was added for 15 minutes. After, PBS was applied for 5 minutes. PBS was aspirated and cells were blocked in PBS with 5% GS for 1 hour. Block was removed, 1°Ab MHCI (DSHB; clone 5.8, mouse) was added undiluted (neat) and incubated overnight at 4°C. Next day, 2°Ab 488 goat anti-mouse (cat. n. A-21141, Thermo Fisher Scientific) diluted to 1:250 in PBS was placed on the dish and incubated for 2 hours at room temperature (RT). The plate was then washed with PBS for 3 x 5 minutes, after which, DAPI was added for 10min and finally washed again with PBS for 2 x 5 minutes.

Images were captured using the NIKON Eclipse Ti microscope at 10x magnification on the FITC and DAPI channel, taking 4 randomized images per well. Analysis of each image consisted of three different measurements using the NIKON elements application. First, myotube diameter required measuring 5 sections along the width of each myotube. Second, myotube surface area used binary thresholding of overall MHCI (FITC) coverage in the entire image. Finally, myonuclear index used the binary thresholding setting for nuclei, which was then calculated by:

> nuclei in myotubes total number of myonuclei x 100 = myonuclear index %

#### RNA extraction and Quantitative Polymerase Chain Reaction

RNA isolation began with aspirating media and washing with PBS. Trizol reagent (cat. n. 15596018; Invitrogen) was added at a ratio of 0.3-0.4ml per 1 x 10<sup>5</sup>-10<sup>7</sup> cells then scraped and pipetted into tubes<sup>154</sup>. Samples were either frozen at -80°C or continued onto the next step<sup>154</sup>. Chloroform was added at 200 uL/mL of Trizol reagent. Tubes were shaken for 15 seconds and incubated at RT for 5 minutes<sup>154</sup>. They were then placed in a centrifuge and spun at 12 000g in 4°C for 10 minutes<sup>154</sup>. The upper aqueous layer was pipetted to a new tube and an equal volume of 100% ethanol was added<sup>154</sup>. Samples were transferred into RNA spin columns placed on top of 2 mL tubes, both acquired from the E.Z.N.A.® Total RNA Kit I (cat. n. R6834-02; VWR)<sup>155</sup>. Tubes were centrifuged at 10 000g for 60 seconds in RT<sup>155</sup>. Flow through was removed and 250uL of wash buffer I was added on the spin column membrane; centrifuged at 10 000g for 60 seconds in RT<sup>155</sup>.

Repeated previous step again, but with 500 uL wash buffer I<sup>155</sup>. Flow through was discarded and 500uL wash buffer II was added onto spin column membrane<sup>155</sup>. Tubes were centrifuged at 10 000g for 60 seconds in RT<sup>155</sup>. Repeated previous step again. Discarded flow through then centrifuged spin column at max speed to completely dry the matrix<sup>155</sup>. The RNA spin column was transferred to a clean 1.5ml collection tube and pipetted 40uL of DEPC-treated water directly onto centre of tubes, incubating for 1min in RT<sup>155</sup>. Centrifuged for 2 minutes at 10 000g. Once complete, RNA content was quantified using the Nano Drop Spectrophotometer<sup>155</sup>.

The high-capacity cDNA reverse transcription kit (cat. n. 4368814; Fisher Scientific) was used to perform RT-qPCR. Kit components *(shown in table 1)* were thawed on ice then master mix was made <sup>156</sup>. 10ul of master mix was pipetted into each individual tube mixed with 10ul of RNA sample<sup>156</sup>. Tubes were placed into the thermal cycler and run with parameters described in table 2<sup>156</sup>.

Component	Volume for 1 reaction
10X RT Buffer	2.0 uL
25X dNTP mix (100mM)	0.8 uL
10X RT Random Primers	2.0 uL
MultiScribe Reverse	1.0 uL
Transcriptase	
Nuclease free H <sub>2</sub> 0	4.2 uL

Table 1. volume of reagents for cDNA reverse transcription

25
Total per reaction	10.0 uL
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Table 2. Settings for cDNA reverse transcription thermal cycler

Settings	Step 1	Step 2	Step 3	Step 4
Temperature	25 °C	37 °C	85 °C	4 °C
Time	10 minutes	120 minutes	5 minutes	œ

SYBR green assay (cat. n. 330500; Qiagen) was used for quantifying gene expression. Myf5, MyoD, Myogenin, MSTN and FSTN were the genes of interest, while RPS11 was used as a housekeeping gene, all primer sequences are included in table 3. All experiments were run on 384 and 96 well plates with sample duplicates and quantified using the QuantStudio5 real-time (serial n. 272530039; Thermofisher) and Mastercycler Realplex 4 (serial n. A242225G; Eppendorf) PCR machine.

The Livak method was used to analyze the expression of genes. The following of which was calculated by:

CT target gene – CT reference gene = normalized CT  $\Delta$ CT test sample –  $\Delta$ CT calibrator sample =  $\Delta\Delta$ CT Fold change =  $2^{-(\Delta\Delta CT)}$ 

Table 3. Primer sequences for qPCR using SYBR green assay

Gene	Forward Primer	Reverse Primer
Products		
RPS11	CGTGACGAACATGAAGATGC	GCACATTGAATCGCACAGTC
Myf5	TGAAGGATGGACATGACGGAG	TTGTGTGCTCCGAAGGCTGCTA
MyoD	TACCAAGGTGGAGATCCTG	CATCATGCCATCAGAGCAGT
Myogenin	CTACAGGCCTTGCTCAGCTC	AGATTGTGGGCGTCTGTAGG
Follistatin	AAAACCTACCGCAACGAATG	GGTCTGATCCACCACAAG
Myostatin	AATCCCGGTGCTGCCGCTAC	GTCGGAGTGCAGCAAGGGCC

## Data Analysis

All data are presented as mean  $\pm$  standard error means. Data was analysed on GraphPad Prism program version 8.0. A two-way ANOVA was used to assess the effect of time course and compound for the MTT assay, all other experiments were analysed using a one-way ANOVA. Both analyses were followed by Tukey *post hoc* analysis to detect statistical significance between three or more independent groups. Statistically significant differences were accepted when *P* was < 0.05.

## RESULTS

## Proliferation rate increases after changing media and compound every 24 hours.

It was determined that replenishing GM + CBD (5uM) every 24 hrs resulted in greater proliferation rates compared to leaving GM + CBD on for 48hrs (p<0.05) assessed via an MTT assay (n=8) (Figure 1A).

Results indicate that replenishing GM + CBN (5uM) every 24 hours produced greater proliferation of myoblasts compared to leaving GM + CBN on for 48 hrs (p<0.05). CBN at 5uM also increased proliferation rates significantly when added for only 8 hours, versus 48 hrs (p<0.05) (n=8) (Figure 1B).





is represented by means with SEM (n = 8). \* indicates significantly different than 5uM at 48hr within the same group.

### CBD and CBN can increase the proliferation of myoblasts

Analysis using an MTT assay revealed supplementation with CBD at 1uM increased the proliferation of C2C12s in comparison to MTH (vehicle control) 1uM (p < 0.0001). In addition, CBD at 5uM showed the same effect by significantly increasing proliferation compared to MTH at 5uM (p < 0.0001). No significant differences were shown between CBD at 0.1uM and the vehicle control MTH at 0.1uM (p > 0.05) (n=12) (Figure 2A).

CBN at 1uM increased the proliferative ability of myoblasts compared to CBN at 0.1uM. (p < 0.0005). Similarly, CBN at 5uM was able to increase proliferation compared to both CBN at 0.1uM and 1uM (p<0.0001, p < 0.05), as well as MTH at 5uM (p<0.0001). At 0.1uM concentration, CBN and MTH showed no significant differences. Similarly, CBN at 1uM and MTH at 1uM showed no differences (p>0.05) (n=12) (Figure 2B).



**Figure 2.** Proliferation of C2C12 myoblasts supplemented with their respective compounds (CBD, CBN, MTH) and concentrations (0.1, 1, 5uM) for 48hours. To quantify this experiment the MTT solution was applied to cells on a 96 well plate and measured using a spectrophotometer at 590nM. All graphs represented as a mean with SEM, data was considered significantly different when P was < 0.05 (n=12). 'a' indicates significantly different than MTH 1, 'b' indicates significantly different than MTH 5, 'c' indicates

significantly different than CBN 5, 'd' indicates significantly different than CBN 1 and CBN 5

## No effect of compound supplementation on gene expression in myoblasts.

After 48 hrs of cell proliferation, mRNA expression of genes associated with the

hypertrophic response were measured. No significant changes in Myf5, MyoD,

Myogenin, FSTN and MSTN gene expression in C2C12 myoblasts were observed when

supplemented with CBD, CBN or MTH at 5uM (p>0.05) (n=6) (Figure 3A, B, C, D, E).



**Figure 3.** Fold change from MTH of gene expression during proliferation. GM + compound was administered at 40% cell confluence; with media being changed every 24hrs. RNA isolation and reverse transcription-PCR techniques were applied after the 2<sup>nd</sup> day. To quantify the amplification signal of gene expression, SYBR green assay was used in

combination with specific primers. Fold change was calculated by  $2^{-(\Delta\Delta CT)}$ . All graphs are shown as means with SEM (n=6).

# No effect of compound supplementation on gene expression in myotubes.

Genes involved with signaling muscle growth were measured using qPCR in C2C12 myotubes that were differentiating for 7 days. DM was supplemented with CBD, CBN or MTH at 5uM. We report no increases to Myf5, MyoD, Myogenin, Follistatin and Myostatin gene expression after supplementation with CBD or CBN at 5uM (p>0.05) (n=6) (Figure 4 A, B, C, D, E).











D





**Figure 4.** Fold change compared to MTH of gene expression during differentiation. Media was changed to DM when cells reached 80% confluency, then, DM + compound was added 24 hrs after at 5uM concentration. Media was changed every 48 hrs until the day 7 (A) Myf5 gene expression (B) MyoD gene expression (C) Myogenin gene expression (D) FSTN gene expression (E) MSTN gene expressions (F) Light microscopy image at 4x magnification of myotubes day 7 of differentiation. All graphs are shown in means with SEM (n=6).

## CBD and CBN supplementation do not affect myotube diameter, surface area, or

## myonuclear index

Using myotube diameter, surface area and myonuclear index as indicators of myotube

differentiation, it was determined that no significant increases were seen after

supplementation with compounds at a concentration of 5 uM in any of the groups

compared to the MTH group (p>0.05) (n=4) (Figure 5 A, B, C). Similarly, no significant

increases were indicated after supplementation with a 1 uM concentration compared to

the MTH group (p>0.05) (n=3) (Figure 6 A, B, C)



**Figure 5.** Data represents quantification of C2C12 differentiation after supplementation with CBD, CBN or MTH at 5uM in DM. Immunofluorescent protocols were used to stain for MHC I (green) and nuclei (blue). The analysis of each image was done on the Nikon Elements application. (A) Calculation of myotube diameter measured in micrometers (B) Myonuclear Index values are expressed in percentages. (C) Myotube surface area was quantified using the binary thresholding application for overall MHCI in uM<sup>2</sup>. (D) Immunofluorescent images acquired from the NIKON Eclipse Ti microscope at 10x

magnification on the FITC and DAPI channel. All data represented as means with SEM (n=4).



**Figure 6.** Quantification of C2C12 differentiation after supplementation of CBD, CBN or MTH at 1uM with DM. Immunofluorescent protocols were used to stain for MHC I and nuclei. The analysis of each image was done on the Nikon Elements application. (A) Calculation of myotube diameter measured in micrometers (B) Myonuclear Index values are expressed in percentages and are calculated by dividing number of nuclei in myotubes by the total nuclei in image then multiplying by 100. (C) Myotube surface area was quantified using the binary thresholding application for overall MHCI in uM<sup>2</sup>. All data represented as means with SEM (n=3).

Significant decrease in follistatin gene expression following differentiation of myoblasts treated with CBD at 1 uM.

In comparison to CBN and MTH, CBD was able to decrease the gene expression of FSTN (p<0.001). Other analyses of gene expression showed no differences in Myf5, MyoD, Myogenin and MSTN in differentiated C2C12s (p>0.05) (n=6) (Figure 7 A, B, C, D, E).



**Figure 7.** Fold change from MTH of gene expression during differentiation. DM was administered after 80% cell confluence, then, DM + compound was added 24 hrs after at 1uM concentration. Media was changed every 48 hrs until day 7. All graphs are shown in means with standard error means (n=6). \* Indicates significantly different than CBN and MTH.

## DISCUSSION

In the current investigation, we report enhanced proliferation of C2C12 cells following 48 hours of supplementation with CBD or CBN. It was also determined that replenishing growth media (GM) and compound every 24 hrs resulted in a greater proliferation of cells compared to not replenishing GM and compound for 48 hrs. Furthermore, since cell proliferation was augmented, it was hypothesized that gene expression of Myf5 and MyoD – the transcription factors known to initiate the myogenic regulatory response<sup>22, 23, 24</sup> – would be significantly higher in the presence of CBD and CBN. However, no notable changes in Myf5 or MyoD gene expression was observed, as was true for myogenin, FSTN and MSTN after supplementation with CBD or CBN at 5 uM. Likewise, no change was observed in gene expression of Myf5, MyoD, Myogenin, FSTN and MSTN in differentiating cells treated with either CBD or CBN at 5 uM. Using immunocytochemical analysis, we quantified the myotube surface area, diameter, and myonuclear index following differentiation, and report no notable differences between cells treated with CBD or CBN as compared to vehicle control-treated cells. To further evaluate the differentiation response to these compounds, a 1uM concentration was used in relation to the significant findings reported by Iannotti and colleagues (2018). Our results indicated that there were no considerable changes in myotube size, diameter, or myonuclear index. The gene expression of Myf5, MyoD, Myogenin, and MSTN were also unchanged, however, supplementation of CBD resulted in significantly lower gene expression of FSTN compared to CBN and MTH (1uM). Overall, our findings were not consistent with our hypothesis stated at the outset.

Based on previous literature<sup>72,73, 146</sup>, we predicted that the supplementation of CBD and CBN would augment myotube formation and the transcription of myogenin, in addition to enhancing cell proliferation with a concomitant up-regulation of Myf5 and MyoD. Iannotti and colleagues (2018) found that CBD at a 1 uM concentration induced greater myotube formation and mRNA expression of myogenin in C2C12 myoblasts<sup>73</sup>. Notably, they also reported that a 3 uM concentration resulted in decreased myogenin transcription<sup>73</sup>. Results in the current study do no align with those previously published. We found no significant increase in myogenin expression or myotube formation at both 1 and 5 uM concentrations. The disparate findings are likely accounted for by the incubation time of CBD on cells. Iannotti and colleagues (2018) added cannabinoids to the DM for 5, 15 mins or 3 hrs, and then replaced it with regular DM for 72 hrs<sup>73</sup>. In comparison, we incubated differentiating cells with CBD for seven days, with media being changed every 48 hrs. The exposure time of CBD was significantly different, which resulted in examining changes in myotubes at different periods of growth. Moreover, it is unknown whether the same CBD compound was used between the two investigations. In the present study, the chemical structure and molecular weight of the compound are clear<sup>139</sup>, whereas this information was not provided in the published study by Iannotti and colleagues (2018). Using the same compound is an important consideration since the agent can be derived synthetically or isolated from plants.

To determine the influence of CBD and CBN on the myogenic response, we investigated the gene expression of critical regulators of SC proliferation and differentiation<sup>29, 49, 114, 138</sup>. It has been well documented that MRFs orchestrate the

myogenic program, and ultimately contribute to the growth, repair, and regeneration of muscle<sup>138</sup>. In the resting state, SCs are quiescent and can be identified by the expression of Pax7<sup>20</sup>. Up-regulation of Myf5 and MyoD, usually by exercise or injury, results in the activation of SC and subsequent entry into the cell cycle. SCs proliferate – referred to as myoblasts – and either self-renew or fuse with existing myofibers *in vivo*, or with other myoblasts *in vitro*. The expression of Mrf4 and myogenin commits myoblasts to differentiation<sup>22, 23, 24</sup>, resulting in the repair and regeneration of muscle. Collectively, these transcription factors are important measures to determine whether CBD or CBN might influence myogenesis or growth of skeletal muscle

Other proteins implicated in the hypertrophic response include MSTN and FSTN. MSTN is a member of the TGB-β superfamily and is well known to negatively regulate muscle growth<sup>29, 49, 114, 120</sup>. MSTN is likely the most potent known regulator of muscle growth, whereby reducing the mRNA expression of MSTN by less than 1% in mice resulted in a 25% increase in muscle mass within three months<sup>30</sup>. Other studies have reported a similar phenomenon in humans, cattle, mice, sheep, and dogs through random mutations in the MSTN gene<sup>32, 33, 34, 35, 36</sup>. This has led to the hypothesis that inhibiting MSTN gene expression could potentially improve human performance or serve as a pharmaceutical target for treating muscle-related diseases, by increasing muscle mass<sup>38, 121</sup>. Indeed, the association between MSTN and sarcopenia has been shown in numerous studies, with results indicating the endogenous levels of MSTN may influence the prevalence of sarcopenia<sup>37, 38</sup>. McKay and colleagues (2012) demonstrated that MSTN protein is localized to SCs<sup>44</sup>. Based on their findings, it was determined that increased colocalization of MSTN in SC induced impairments in the myogenic capacity of aged muscle<sup>44</sup>. In another study, it was noted that inhibiting MSTN gene expression resulted in enhanced muscle growth in mice experiencing an age-related decline of muscle mass<sup>49</sup>. Given the unfavorable effect of increasing MSTN in old age, the delivery of FSTN presents a promising approach for increasing skeletal muscle mass. Specifically, FSTN is a robust antagonist of MSTN that has the primary function of binding and neutralizing members of the TGF- $\beta$  superfamily<sup>121</sup>. The experimental overexpression of FSTN in mice significantly increases muscle mass while decreasing fat accumulation, compared to their wild type counterparts<sup>49</sup>. Therefore, it would be beneficial if a nutritional supplement was capable of inhibiting the expression of MSTN while increasing FSTN. In search of a novel compound that could target both proteins, Gutierrez-Salmean and colleagues (2014) investigated the influence of epicatechin – a polyphenol found in plants – in mice and humans<sup>153</sup>. It was determined that epicatechin decreased MSTN and  $\beta$ -galactosidase expression, as well as increased levels of genetic markers associated with myogenesis in mice<sup>153</sup>. As a proof of principle, it was also demonstrated in humans that treatment for seven days with epicatechin improved handgrip strength and increased the plasma levels of FSTN and decreases MSTN levels<sup>153</sup>. This evidence reveals a promising strategy for the role of nutrition in regulating the hypertrophic response. To determine if cannabinoids influenced the regulation of MSTN and FSTN, the current investigation measured the gene expression of MSTN and FSTN in C2C12 myotubes after supplementation with CBD or CBN for seven days. The evidence in our study suggests that both CBD and CBN did not affect the regulation of MSTN and FSTN.

## Limitations and Future Directions

In the current study, it was noted that CBD and CBN were able to increase the growth rate of cells using immunofluorescent quantification via MTT. However, the gene expression data does not support this finding. It was unusual that Myf5 and MyoD gene expression were not up-regulated following treatment with CBD or CBN. The MTT assay measures mitochondrial quantity as an indicator of cell growth, whereby the expression of purple formazan metabolized from yellow MTT suggests an increase in cell growth, however, it is possible that CBD or CBN improved the metabolic capacity of these cells instead. It would be beneficial to examine other mechanisms involved in the cell cycle that can further elucidate the proliferation of myoblasts supplemented with CBD or CBN. To further examine cell proliferation, numerous enzymes known as cyclin-dependent kinases (Cdk) actively regulate the cell cycle when bound to cyclins<sup>151</sup>. In eukaryotic cells, these involve complex combinations through different phases of the cell cycle, which in turn provide additional control to the cell-cycle machinery<sup>151</sup>. In addition to Myf5 and MyoD, these regulatory proteins can also influence the initiation of the cell through the  $G_{1/S/G_{2/and}}$  M phase, which can provide a clear picture of the events during cell growth. In consideration to our experimental timeline during cell exposure to CBD or CBN, the analysis of gene expression and myotube formation was performed after 48 hrs and seven days in proliferation and differentiation, respectively. In doing so, the possible impacts on myoblasts and myotubes may have been realized earlier on and the effects of the supplement may have diminished thereafter. Another unexpected outcome was the decreased expression of FSTN after supplementation with CBD at 1 uM, although carefully controlled for, this anomaly could stem from the usage of cells that were in a different passage or level of cell viability.

Evidence using a 2D culture model in drug discovery has identified limitations of in vitro cell responses to guide pharmaceutical interventions. The nature of cells grown in a monolayer does not resemble the complete structure of skeletal muscle<sup>118</sup>. Notably, the absence of an extracellular matrix (ECM) is a significant limitation to in vitro models. It was thought that the ECM simply provided structural support; however, it is now appreciated that the ECM is capable of influencing most aspects of cell behaviour<sup>118</sup>. Components of the ECM, include factors such as matrix proteins, glycoproteins, proteoglycans, and ECM sequestered growth factors<sup>118</sup>. In the absence of factors such as those listed above, a 2D in vitro approach is inherently limiting since many factors can influence cell differentiation and proliferation<sup>118</sup>. It has been suggested that an ideal culture model should incorporate tissue-specific stiffness, oxygen, nutrient and metabolic waste gradients, a combination of tissue-specific scaffolding and cell-to-cell and cell-to-ECM interactions<sup>117</sup>. However, to our knowledge, no current 3D culture method meets all of the criteria mentioned above. Rather each 3D culture model has its advantages, but also limitations. A feasible option for future investigations is to use a 2.5D model in which cells are plated on top of a thick layer of ECM. The method allows for a better representation of the complex microenvironment seen *in vivo*, while also being suitable for the current objectives in this project – providing high throughput screening, and tissue-specific differentiation in cells<sup>117</sup>. In conjunction with the proposed method, primary muscle cells could also be added as a means to better represent the physiological

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structures in muscle tissue. Furthermore, the cell-based assays used in the current investigation – such as MTT, immunocytochemistry, and qPCR – are still applicable in a 2.5D culture approach.

#### Conclusion

In summary, the primary objective of this investigation was to evaluate the effect of CBD and CBN supplementation on murine myoblast proliferation and differentiation, to determine whether these compounds might enhance the myogenic response. Based on our results, it was evident that following supplementation, both CBD and CBN improved cell proliferation after 48 hrs in culture but did not impact differentiation after seven days of incubation. Studies have shown the effectiveness of CBD and CBN as an antiinflammatory and antioxidative medicine<sup>123, 124, 125</sup>. However, recent evidence from Giacoppo et al. 2016 and Iannotti et al. 2018 has suggested a potential for CBD as effective therapeutic interventions for muscular dystrophies. The fact that CBD and CBN might serve an as effective strategy for muscle-related pathology is not a trivial matter, given that the proportion of older adults in society is rapidly growing. Future directions for this research should aim to focus on evaluating the absorption, distribution, metabolism, and excretion of CBD and CBN in vitro. As previously mentioned, cell culture techniques involving HepG2 are an effective and commonly used method when measuring the cytotoxicity of new drugs and compounds<sup>137</sup>; because of the high degree of morphological and functional resemblance to the liver, they are a suitable model to study the metabolism of CBD and CBN supplementation, which would provide a basis for the safety and feasibility of consuming cannabinoids. To identify improvements in

mitochondrial function from CBD or CBN, the Agilent Seahorse XF analyzer can be utilized to measure glycolysis and oxidative phosphorylation in cells, which will expand upon the findings shown here. Other future experiments should also evaluate the gene expression of cyclin-dependent kinases such as CDK1, which has been shown to be essential for cell proliferation<sup>152</sup>, and will provide a complete picture of possible cell growth. Finally, with respect to our timeline for analysis of gene expression late into differentiation (day 7), it would be of interest to look at the acute response from exposure to supplements for both proliferating and differentiating cells (i.e. day 1, 5 and 7), potentially presenting a significant effect earlier on in the incubation period.

# **APPENDIX: SUPPLEMENTARY PICS, RAW DATA AND STATISTICS**

# RAW DATA Proliferation Time Course Experiment (8+40hrs, 24+24hrs, 48hrs)

# CBD

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# TWO-WAY ANOVA Analysis of Proliferation Time Course Results

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CBN Time course MTT test	10 8 + 40 vs. 24 + 24	-0.04047	-0.1299 to 0.04894	No	ns	0.5291			
New Graph	11 8 + 40 vs. 48 hours	-0.02523	-0.1146 to 0.06417	No	ns	0.7796			
/ Layouts >>	12 24 + 24 vs. 48 hours	0.01524	-0.07417 to 0.1046	No	ns	0.9130			
👷 Layout 1	13								
amily »	14 CBN 0.1								
CBN Time course MTT test	15 8 + 40 vs. 24 + 24	-0.008387	-0.09779 to 0.0810	No	ns	0.9728			
= 2way ANOVA	16 8 + 40 vs. 48 hours	0.03855	-0.05085 to 0.1280	No	ns	0.5609			
	17 24 + 24 vs. 48 hours	0.04694	-0.04247 to 0.1363	No	ns	0.4259			
	18								
	19 CBN 1								
	20 8 + 40 vs. 24 + 24	0.02898	-0.06042 to 0.1184	No	ns	0.7203			
	21 8 + 40 vs. 48 hours	-0.004467	-0.09387 to 0.0849	No	ns	0.9922			
	22 24 + 24 vs. 48 hours	-0.03345	-0.1228 to 0.05596	No	ns	0.6465			
	23								
	24 CBN 5								
	25 8 + 40 vs. 24 + 24	-0.006188	-0.09559 to 0.0832	No	ns	0.9851			
	26 8 + 40 vs. 48 hours	0.1183	0.02885 to 0.2077	Yes	••	0.0062			
	27 24 + 24 vs. 48 hours	0.1244	0.03503 to 0.2138	Yes		0.0038			
	N R E C Way ANOVA of CBN Time of	ourse MTT test		Column A				Q -0	

		NTT prolife	ration time cou	irse cbd cbn mth	Nov 10 - Ed	lited							
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CBD Time course MTT test		Multiple comparisons											
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▼ Info »	24												
<ol> <li>Project info 1</li> </ol>	25	48 hours											
New Info	26	MTH vs. CBN 0.1	0.06931	-0.02891 to 0.1675	No	ns	0.2577						
▼ Results >>	27	MTH vs. CBN 1	-0.05857	-0.1568 to 0.03965	No	ns	0.4051						
⊒ 2way ANOVA of CBD Time course №	28	MTH vs. CBN 5	-0.03500	-0.1332 to 0.06322	No	ns	0.7867						
2way ANOVA of CBN Time course Manu Apply in	29	CBN 0.1 vs. CBN 1	-0.1279	-0.2261 to -0.02966	Yes		0.0054						
▼ Graphs »	30	CBN 0.1 vs. CBN 5	-0.1043	-0.2025 to -0.00609	Yes	•	0.0330						
CBD Time course MTT test	31	CBN 1 vs. CBN 5	0.02357	-0.07465 to 0.1218	No	ns	0.9224						
CBN Time course MTT test	32												
New Graph	33												
▼ Layouts »	34	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	N1		N2		q	DF	
Layout 1	35												
New Layout	36	8 + 40											
Family »	37	MTH vs. CBN 0.1	0.5703	0.5648	0.005533	0.03747	8		8		0.2088	84.00	
CBN Time course MTT test	38	MTH vs. CBN 1	0.5703	0.6497	-0.07933	0.03747	8		8		2.994	84.00	
E ZWAY ANOVA	39	MTH vs. CBN 5	0.5703	0.7488	-0.1785	0.03747	8		8		6.736	84.00	
	40	CBN 0.1 vs. CBN 1	0.5648	0.6497	-0.08487	0.03747	8		8		3.203	84.00	
	41	CBN 0.1 vs. CBN 5	0.5648	0.7488	-0.1840	0.03747	8		8		6.945	84.00	
	42	CBN 1 vs. CBN 5	0.6497	0.7488	-0.09915	0.03747	8		8		3.742	84.00	
	43												
	44	24 + 24											
	45	MTH vs. CBN 0.1	0.6108	0.5732	0.03761	0.03747	8		8		1.420	84.00	
	46	MTH vs. CBN 1	0.6108	0.6207	-0.009887	0.03747	8		8		0.3732	84.00	
	47	MTH vs. CBN 5	0.6108	0.7550	-0.1442	0.03747	8		8		5.442	84.00	
	48	CBN 0.1 vs. CBN 1	0.5732	0.6207	-0.04750	0.03747	8		8		1.793	84.00	
	49	CBN 0.1 vs. CBN 5	0.5732	0.7550	-0.1818	0.03747	8		8		6.862	84.00	
	50	CBN 1 vs. CBN 5	0.6207	0.7550	-0.1343	0.03747	8		8		5.069	84.00	
	51												
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Decise tinfe 1	34 Test details	mean i	mean z	mean Diff.	ac or ann.	NI	NZ	9	Dr	
Project Into 1     New Info	35									
Results »	37 MTH vs CBN 0.1	0.5703	0.5648	0.005533	0.03747	8	8	0.2088	84.00	
2way ANOVA of CBD Time course N	38 MTH vs. CBN 1	0.5703	0.6497	-0.07933	0.03747	8	8	2 994	84.00	
a 2way ANOVA of CBN Time course	39 MTH vs. CBN 5	0.5703	0.7488	-0.1785	0.03747	8	8	6.736	84.00	
New Analysis	40 CBN 01 vs CBN 1	0.5648	0.6497	-0.08487	0.03747	8	8	3 203	84.00	_
Graphs >>	41 CBN 01 vs CBN 5	0.5648	0.7488	-0 1840	0.03747	8	8	6.945	84.00	_
CBD Time course MTT test	42 CBN 1 vs. CBN 5	0.6497	0.7488	-0.09915	0.03747	8	8	3.742	84.00	
New Graph	43						-			
Layouts »	44 24+24									
🟦 Layout 1	45 MTH vs. CBN 0.1	0.6108	0.5732	0.03761	0.03747	8	8	1.420	84.00	
New Layout	46 MTH vs. CBN 1	0.6108	0.6207	-0.009887	0.03747	8	8	0.3732	84.00	
amily »	47 MTH vs. CBN 5	0.6108	0.7550	-0.1442	0.03747	8	8	5.442	84.00	
CBN Time course MTT test	48 CBN 0.1 vs. CBN 1	0.5732	0.6207	-0.04750	0.03747	8	8	1.793	84.00	
= 2way ANOVA	49 CBN 0.1 vs. CBN 5	0.5732	0.7550	-0.1818	0.03747	8	8	6.862	84.00	_
	50 CBN 1 vs. CBN 5	0.6207	0.7550	-0.1343	0.03747	8	8	5.069	84.00	_
	51									
	52 48 hours									
	53 MTH vs. CBN 0.1	0.5956	0.5263	0.06931	0.03747	8	8	2.616	84.00	
	54 MTH vs. CBN 1	0.5956	0.6541	-0.05857	0.03747	8	8	2.211	84.00	
	55 MTH vs. CBN 5	0.5956	0.6306	-0.03500	0.03747	8	8	1.321	84.00	
	56 CBN 0.1 vs. CBN 1	0.5263	0.6541	-0.1279	0.03747	8	8	4.827	84.00	
	57 CBN 0.1 vs. CBN 5	0.5263	0.6306	-0.1043	0.03747	8	8	3.937	84.00	
	58 CBN 1 vs. CBN 5	0.6541	0.6306	0.02357	0.03747	8	8	0.8896	84.00	
	59									
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RAW DATA 48 hours Proliferation Concentration Experiment (0.1uM, 1uM, 5uM) CBD

					📔 48 hr	MTT prolifer	ation cbd cb m	th Nov 10							
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Effect of Cannabidiol on prolife		0	Mean	SEM	N	Mean	SEM	N	Mean	SEM	N	Mean	SEM	N	Mean
Effect of Cannabinol on proliferal	1	Title	0.152166667	0.005457596	12	0.206416667	0.017355227	12	0.202416667	0.011015456	12	0.151583333	0.012492700	12	0.1220833
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Effect of Cannabidiol on prolife	9	TIDe													
Effect of Cannabinol on proliferat	10	Title													
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Ordinary one-way ANOVA	17	Title													
Effect of Cannabidiol on prolifera	18	Title													
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📰 Effect of Cannabidiol on prolifera		G	Mean	SEM	N	Mean	SEM	N	Mean	SEM	N	Mean	SEM	N	Mean
Effect of Cannabinol on proliferation	1	Title	0.202416667	0.011015456	1:	2 0.151583333	0.012492700	12	0.122083333	0.003869967	12	0.118583333	0.007140854	12	
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Effect of Cannabidiol on prolifera	9	TIDe													
Effect of Cannabinol on proliferation	10	Title													
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Effect of Cannabidiol on prolifera	16	Title													
Ordinary one-way ANOVA	17	Title													
Effect of Cannabidiol on prolifera	18	Title													
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	00			Effect of Car	nabidiol on r	I Voliferation (48)	e) 🖾 🖉 💌	Prov A A	CBD 0.1			1			
	- 88			Enect of Car	macroiol on p	nomeration (46)	0.00		. 000 0.1	_					

CBN

					48	hr MTT prolif	eration cbd	cb mth Nov 10							
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🖉 Data Tables 🛛 🔅 🖉		CBN 0.1			CBN 1			CBN 5			MTH 0.1			MTH 1	
Effect of Cannabidiol on prolifera		Mean	SEM	N	Mean	SEM	N	Mean	SEM	N	Mean	SEM	N	Mean	SEM
🔠 Effect of Cannabinol on prolife	1	0.098083333	0.005814635	5 12	0.15225	0.00944	12	0.190083333	0.010921523	12	0.115916667	0.008814982	13	0.120666667	0.00857
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Effect of Cannabidiol on prolifera	10														
Effect of Cannabinol on prolife	11														
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⊴ ◄ ▶ ♥	Li 88			Effect of	of Cannabinol on	proliferation (4	8hr) 🔛 ලංච	<ul> <li>Row 1,</li> </ul>	F: MTH 5					a	

000					4	8 hr MTT prolit	eration cbd cb	mth Nov 10							
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Qr Search	_			Group C			Group D			Group E			Group F		
▼ Data Tables >>>			CBN 5			MTH 0.1			MTH 1				MTH 5		
Effect of Cannabidiol on proliferatio		N	Mean	SEM	N	Mean	SEM	N	Mean	SEM	N	Mean	SEM	N	Mean
Effect of Cannabinol on proliferat	1	12	0.190083333	0.010921523	12	0.115916667	0.008814982	12	0.120666667	0.008578809	12	0.123833333	0.007293452	12	
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# CBD

			📙 48 hr MTT proliferation cb	d cb mth No	v 10						
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Data Tables     >											
Effect of Cannabidiol on prolifera		ANOVA results									
Effect of Cannabinol on proliferation											
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Project info 1	2	Data sets analyzed	A-F								
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Results >>	4	ANOVA summary									
Ordinary one-way ANOVA of Effer	5	F	12.87								
Ordinary one-way ANOVA of Effect	6	Pivalue	<0.0001								
New Analysis	7	P value summary	****								
Graphs >>	8	Significant diff, among means (P < 0.05)?	Ves								
Effect of Cannabidio on proliferation	9	R squared	0.4936								
New Graph	10	it squares	0.4000								
/ Layouts >>>	11	Brown-Forsythe test									
🔐 Layout 1	12	F (DEn DEd)									
New Layout	13	P value									
amily »	14	P value summary									
📰 Effect of Cannabidiol on prolifera	15	Are SDs significantly different (P < 0.05)?									
Ordinary one-way ANOVA	16										
	17	Bartlett's test									
	18	Bartlett's statistic (corrected)	29.15								
	19	P value	<0.0001								
	20	P value summary	****								
	21	Are SDs significantly different (P < 0.05)?	Yes								
	22										
	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value				
	24	Treatment (between columns)	0.08678	5	0.01736	F (5, 66) = 12.87	P<0.0001				
	25	Residual (within columns)	0.08902	66	0.001349						
	26	Total	0.1758	71							
	27										
	28	Data summary									
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Data Tables     Beffect of Cannabidiol on prolife     Effect of Cannabinol on proliferal	Ordinary one-way ANOVA Multiple comparisons								
(     • New Data Table	1 Number of families								
Project info 1	2 Number of comparisons per family	_							
New Info	3 Alpha						-		
▼ Results >>	4						-	-	
Ordinary one-way ANOVA of Ef	5 Tukey's multiple comparisons test	95.00% CI of diff.	Significant?	Summary	Adjusted P Value				
Ordinary one-way ANOVA of Effe	6 CBD 0.1 vs. CBD 1	-0.09826 to -0.01024	Yes		0.0073	A-B			
(+) New Analysis	7 CBD 0.1 vs. CBD 5	-0.09426 to -0.006244	Yes		0.0161	A-C			
Effect of Cannabidiol on prolifera	8 CBD 0.1 vs. MTH 0.1	-0.04342 to 0.04459	No	ns	>0.9999	A-D			
Effect of Cannabinol on proliferat	9 CBD 0.1 vs. MTH 1	-0.01392 to 0.07409	No	ns	0.3498	A-E			
New Graph	10 CBD 0.1 vs. MTH 5	-0.01042 to 0.07759	No	ns	0.2339	A-F			
▼ Layouts >>	11 CBD 1 vs. CBD 5	-0.04001 to 0.04801	No	ns	0.9998	B-C			
Layout 1	12 CBD 1 vs. MTH 0.1	0.01083 to 0.09884	Yes		0.0065	B-D			
Wew Layout	13 CBD 1 vs. MTH 1	0.04033 to 0.1283	Yes	****	<0.0001	B-E			
Family >>	14 CBD 1 vs. MTH 5	0.04383 to 0.1318	Yes	****	<0.0001	B-F			
Effect of Cannabidiol on prolifera	15 CBD 5 vs. MTH 0.1	0.006828 to 0.09484	Yes	•	0.0144	C-D			
Ordinary one-way ANOVA	16 CBD 5 vs. MTH 1	0.03633 to 0.1243	Yes		<0.0001	C-E			
	17 CBD 5 vs. MTH 5	0.03983 to 0.1278	Yes		<0.0001	C-F			
	18 MTH 0.1 vs. MTH 1	-0.01451 to 0.07351	No	ns	0.3718	D-E			
	19 MTH 0.1 vs. MTH 5	-0.01101 to 0.07701	No	ns	0.2513	D-F			
	20 MTH 1 vs. MTH 5	-0.04051 to 0.04751	No	ns	>0.9999	E-F			
	21								
	22 Test details	Mean 2	Mean Diff.	SE of diff.	n1	n2	q	DF	
	23 CBD 0.1 vs. CBD 1	0.2064	-0.05425	0.01499	12	12	5.117	66	
	24 CBD 0.1 vs. CBD 5	0.2024	-0.05025	0.01499	12	12	4.740	66	
	25 CBD 0.1 vs. MTH 0.1	0.1516	0.0005833	0.01499	12	12	0.05502	66	
	26 CBD 0.1 vs. MTH 1	0.1221	0.03008	0.01499	12	12	2.838	66	
	27 CBD 0.1 vs. MTH 5	0.1186	0.03358	0.01499	12	12	3.168	66	

			🧧 48 hr MT	T proliferation cbd cb mth	n Nov 10									
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Effect of Cannabidiol on prolifera		Multiple comparisons												
Effect of Cannabinol on proliferation		manple companionia	-											
New Data Table	44	CRD 1 CRD 5	0.004000	0.04001 to 0.04901	Ne		0.0	000			8.0			-
▼ Info >>	40	CBD 1 vs. CBD 5	0.004000	-0.04001 t0 0.04801	No	**	0.8	1990			8.0			+
Project into i	12	CBD I VS. MIH 0.1	0.03463	0.01083 10 0.09884	165		0.0	005			8-0			+
W Results	13	CBD 1 VS. MIH 1	0.08433	0.04033 to 0.1283	Yes		<0	.0001			B-E			_
Ordinary one-way ANOVA of Effe	14	GBD I VS. MIH 5	0.08783	0.04383 to 0.1318	res		<0	.0001			D-P			-
Ordinary one-way ANOVA of Effect	15	GBD 5 vs. MTH 0.1	0.05083	0.006828 to 0.09484	Yes		0.0	144			C-D			_
New Analysis	16	CBD 5 vs. MTH 1	0.08033	0.03633 to 0.1243	Yes		<0	.0001			C-E			_
▼ Graphs >>	17	CBD 5 vs. MTH 5	0.08383	0.03983 to 0.1278	Yes		<0	.0001			C-F			
Effect of Cannabidiol on proliferatio	18	MTH 0.1 vs. MTH 1	0.02950	-0.01451 to 0.07351	No	ns	0.3	3718			D-E			
Effect of Cannabinol on proliferation	19	MTH 0.1 vs. MTH 5	0.03300	-0.01101 to 0.07701	No	ns	0.2	2513			D-F			
New Graph	20	MTH 1 vs. MTH 5	0.003500	-0.04051 to 0.04751	No	ns	>0	.9999			E-F			
* Layouts »	21													
New Lavout	22	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1				n2	q	DF	
0	23	CBD 0.1 vs. CBD 1	0.1522	0.2064	-0.05425	0.01499	12				12	5.117	66	
Family >>	24	CBD 0.1 vs. CBD 5	0.1522	0.2024	-0.05025	0.01499	12				12	4.740	66	
Effect of Cannabidiol on prolifera	25	CBD 0.1 vs. MTH 0.1	0.1522	0.1516	0.0005833	0.01499	12				12	0.05502	66	
- Ordinary one-way AROVA	26	CBD 0.1 vs. MTH 1	0.1522	0.1221	0.03008	0.01499	12				12	2.838	66	
	27	CBD 0.1 vs. MTH 5	0.1522	0.1186	0.03358	0.01499	12				12	3.168	66	
	28	CBD 1 vs. CBD 5	0.2064	0.2024	0.004000	0.01499	12				12	0.3773	66	
	29	CBD 1 vs. MTH 0.1	0.2064	0.1516	0.05483	0.01499	12				12	5.172	66	
	30	CBD 1 vs. MTH 1	0.2064	0.1221	0.08433	0.01499	12				12	7.955	66	
	31	CBD 1 vs. MTH 5	0.2064	0.1186	0.08783	0.01499	12				12	8.285	66	
	32	CBD 5 vs. MTH 0.1	0.2024	0.1516	0.05083	0.01499	12				12	4.795	66	
	33	CBD 5 vs. MTH 1	0.2024	0.1221	0.08033	0.01499	12				12	7.577	66	
	34	CBD 5 vs. MTH 5	0.2024	0.1186	0.08383	0.01499	12				12	7.908	66	+
	35	MTH 0.1 vs. MTH 1	0.1516	0.1221	0.02950	0.01499	12				12	2.783	66	+
	36	MTH 0.1 vs. MTH 5	0.1516	0.1186	0.03300	0.01499	12				12	3.113	66	+
	37	MTH 1 vs. MTH 5	0.1221	0.1186	0.003500	0.01499	12				12	0.3301	66	+
	38													+
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	85	Urdinary one-w	ay ANOVA OF ET	Rect of Carmana de Re	w n, coudmin e		_	_	_	_				

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Data Tables     Section 2	Ordinary one-way ANOVA ANOVA results								
New Data Table									
▼ Info »	1 Table Analyzed	Effect of Cannabinol on proliferation (48hr)							
Project into 1     Maw lafa	2 Data sets analyzed	A-F							
▼ Results >>									
E Ordinary one-way ANOVA of Effect	5 E	14.44							
Ordinary one-way ANOVA of Efference	6 Puelue	<0.0001							
New Analysis	7 Pivalue summary	40.0001							
<ul> <li>Graphs &gt;&gt;</li> <li>Effect of Cannabidial on proliferation</li> </ul>	8 Significant diff. among means (P < 0.05)?	Yes							
Effect of Cannabinol on proliferation	9 R squared	0.5225							
New Graph	10								
▼ Layouts >>	11 Brown-Forsythe test								
Layout 1	12 F (DFn, DFd)								
New Layout	13 P value								
amily »	14 P value summary								
Effect of Cannabinol on proliferat	15 Are SDs significantly different (P < 0.05)?								
Ordinary one-way ANOVA	16								
	17 Bartlett's test								
	18 Bartlett's statistic (corrected)	4.707							
	19 P value	0.4527							
	20 P value summary	ns							
	21 Are SDs significantly different (P < 0.05)?	No							
	22								
	23 ANOVA table	SS	DF	MS	F (DFn, DFd)	P value			
	24 Treatment (between columns)	0.06450	5	0.01290	F (5, 66) = 14.44	P<0.0001			
	25 Residual (within columns)	0.05896	66	0.0008933			_		
	26 Total	0.1235	71				_		
	27						_	 	
	28 Data summary								

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Effect of Cannabidiol on prolifera	Ordinary one-way ANOVA								
Effect of Cannabinol on prolife	Multiple comparisons								
New Data Table	1 Number of femilies	4							
nfo »	1 Number of families	1							
Project into 1     Advantation	2 Number of comparisons per family	15							
Pacults 20	3 Alpha	0.05							
Ordinary one-way ANOVA of Effe	4				-				
Ordinary one-way ANOVA of Ef	5 Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value			
New Analysis	6 CBN 0.1 vs. CBN 1	-0.05417	-0.08998 to -0.01835	Yes		0.0005	A-B		
Graphs »	7 CBN 0.1 vs. CBN 5	-0.09200	-0.1278 to -0.05619	Yes		<0.0001	A-C		
Effect of Cannabidiol on prolifera	8 CBN 0.1 vs. MTH 0.1	-0.01783	-0.05365 to 0.01798	No	ns	0.6895	A-D		
Effect of Cannabinol on proliferat	9 CBN 0.1 vs. MTH 1	-0.02258	-0.05840 to 0.01323	No	ns	0.4412	A-E		
+ New Graph	10 CBN 0.1 vs. MTH 5	-0.02575	-0.06156 to 0.01006	No	ns	0.2948	A-F		
P Lavout 1	11 CBN 1 vs. CBN 5	-0.03783	-0.07365 to -0.002021	Yes		0.0324	B-C		
New Layout	12 CBN 1 vs. MTH 0.1	0.03633	0.0005207 to 0.07215	Yes	•	0.0448	B-D		
•	13 CBN 1 vs. MTH 1	0.03158	-0.004229 to 0.06740	No	ns	0.1146	B-E		
Effect of Cannabinol on proliferat	14 CBN 1 vs. MTH 5	0.02842	-0.007396 to 0.06423	No	ns	0.1974	B-F		
= Ordinary one-way ANOVA	15 CBN 5 vs. MTH 0.1	0.07417	0.03835 to 0.1100	Yes		<0.0001	C-D		
	16 CBN 5 vs. MTH 1	0.06942	0.03360 to 0.1052	Yes		<0.0001	C-E		
	17 CBN 5 vs. MTH 5	0.06625	0.03044 to 0.1021	Yes		<0.0001	C-F		
	18 MTH 0.1 vs. MTH 1	-0.004750	-0.04056 to 0.03106	No	ns	0.9988	D-E		
	19 MTH 0.1 vs. MTH 5	-0.007917	-0.04373 to 0.02790	No	ns	0.9867	D-F		
	20 MTH 1 vs. MTH 5	-0.003167	-0.03898 to 0.03265	No	ns	0.9998	E-F		
	21								
	22 Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1	n2	q	DF
	23 CBN 0.1 vs. CBN 1	0.09808	0.1523	-0.05417	0.01220	12	12	6.278	66
	24 CBN 0.1 vs. CBN 5	0.09808	0.1901	-0.09200	0.01220	12	12	10.66	66
	25 CBN 0.1 vs. MTH 0.1	0.09808	0.1159	-0.01783	0.01220	12	12	2.067	66
	26 CBN 0.1 vs. MTH 1	0.09808	0.1207	-0.02258	0.01220	12	12	2.618	66
	27 CBN 0.1 vs. MTH 5	0.09808	0.1238	-0.02575	0.01220	12	12	2.985	66

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Data Tables     Data Tables     Effect of Cannabidiol on proliferatio     Effect of Cannabinol on proliferat     May Data Table	Ordinary one-way Al Multiple comparis	NOVA							
Info »	12 CBN 1 vs. MTH 0.1	0.03633	0.0005207 to 0.07215	Yes	•	0.0448	B-D		
Project info 1	13 CBN 1 vs. MTH 1	0.03158	-0.004229 to 0.06740	No	ns	0.1146	8-E		
New Info	14 CBN 1 vs. MTH 5	0.02842	-0.007396 to 0.06423	No	ns	0.1974	B-F		
Results >>	15 CBN 5 vs. MTH 0.1	0.07417	0.03835 to 0.1100	Yes	••••	<0.0001	C-D		
Ordinary one-way ANOVA of Effect	16 CBN 5 vs. MTH 1	0.06942	0.03360 to 0.1052	Yes		<0.0001	C-E		
Ordinary one-way ANOVA of Efference	17 CBN 5 vs. MTH 5	0.06625	0.03044 to 0.1021	Yes		<0.0001	C-F		
New Analysis  Cranka	18 MTH 0.1 vs. MTH 1	-0.004750	-0.04056 to 0.03106	No	ns	0.9988	D-E		
Effect of Cannabidiol on proliferation	19 MTH 0.1 vs. MTH 5	-0.007917	-0.04373 to 0.02790	No	ns	0.9867	D-F		
Effect of Cannabinol on proliferation	20 MTH 1 vs. MTH 5	-0.003167	-0.03898 to 0.03265	No	ns	0.9998	E-F		
New Graph	21								_
Layouts >>	22 Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1	n2	a	DF
Layout 1	23 CBN 0.1 vs. CBN 1	0.09808	0.1523	-0.05417	0.01220	12	12	6.278	66
New Layout	24 CBN 0.1 vs. CBN 5	0.09808	0.1901	-0.09200	0.01220	12	12	10.66	66
mily »	25 CBN 0.1 vs. MTH 0.1	0.09808	0,1159	-0.01783	0.01220	12	12	2.067	66
Effect of Cannabinol on proliferat	26 CBN 0.1 vs. MTH 1	0.09808	0.1207	-0.02258	0.01220	12	12	2.618	66
Ordinary one-way ANOVA	27 CBN 0.1 vs. MTH 5	0.09808	0.1238	-0.02575	0.01220	12	12	2.985	66
	28 CBN 1 vs. CBN 5	0.1523	0.1901	-0.03783	0.01220	12	12	4.385	66
	29 CBN 1 vs. MTH 0.1	0.1523	0.1159	0.03633	0.01220	12	12	4.211	66
	30 CBN 1 vs. MTH 1	0.1523	0.1207	0.03158	0.01220	12	12	3.661	66
	31 CBN 1 vs. MTH 5	0.1523	0.1238	0.02842	0.01220	12	12	3.294	66
	32 CBN 5 vs. MTH 0.1	0.1901	0.1159	0.07417	0.01220	12	12	8.596	66
	33 CBN 5 vs. MTH 1	0.1901	0.1207	0.06942	0.01220	12	12	8.046	66
	34 CBN 5 vs. MTH 5	0.1901	0.1238	0.06625	0.01220	12	12	7.679	66
	35 MTH 0.1 vs. MTH 1	0.1159	0.1207	-0.004750	0.01220	12	12	0.5505	66
	36 MTH 0.1 vs. MTH 5	0.1159	0.1238	-0.007917	0.01220	12	12	0.9176	66
	37 MTH 1 vs. MTH 5	0.1207	0.1238	-0.003167	0.01220	12	12	0.3670	66
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	20						-		

# PLATE LAYOUT Real Time-PCR (5uM)

TRIAL 3










**TRIAL 4 & 5** 

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6         Λ         60         Colora 1         60         61         Λ         60         61         60 <th< td=""><td>5</td><td></td><td></td><td>1</td><td>2 3</td><td></td><td>•</td><td>5 6</td><td>5</td><td>7 8</td><td>8 9</td><td>10</td><td>1</td><td>1 13</td><td>13</td><td>14</td><td></td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td></th<>	5			1	2 3		•	5 6	5	7 8	8 9	10	1	1 13	13	14		15	16	17	18	19
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S         C         Nonlini I         Overalization of the second secon	7	8	4D CBN 1.1	4D CBN 1.1	4D CBN 1.2	4D CBN 1.2	4D CBN 2.1	4D CBN 2.1	4D CBN 2.	2 4D CBN 2.2	4D CBN 3.1	4D CBN 3.1	4D CBN 3.2	4D CBN 3.2								
Unit         Unit <th< td=""><td>8</td><td>c</td><td>4D MTH 1.</td><td>1 4D MTH 1.</td><td>40 MTH 1.2</td><td>4D MTH 1.2</td><td>4D MTH 2.1</td><td>40 MTH 2.1</td><td>4D MTH 2</td><td>.2 40 MTH 2.2</td><td>4D MTH 3.1</td><td>4D MTH 3.1</td><td>4D MTH 3.2</td><td>4D MTH 3.2</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	8	c	4D MTH 1.	1 4D MTH 1.	40 MTH 1.2	4D MTH 1.2	4D MTH 2.1	40 MTH 2.1	4D MTH 2	.2 40 MTH 2.2	4D MTH 3.1	4D MTH 3.1	4D MTH 3.2	4D MTH 3.2	-							
11         F         20 MTH 1         0 MTH 1<	10	E	5D CBN 1.1	5D CBN 1.1	5D CBO 1.2	5D CBN 1.2	5D CBN 2.1	5D CBN 2.1	5D CBN 2.	2 5D CBN 2.2	5D CBN 3.1	5D CBN 3.1	5D CBN 3.2	5D CBN 3.2								
21         G         PF C011         PF C012         SF C013         SF C013<	11	F	5D MTH 1.	1 5D MTH 1	5D MTH 1.2	5D MTH 1.2	5D MTH 2.1	5D MTH 2.1	5D MTH 2	2 5D MTH 2.2	5D MTH 3.1	5D MTH 3.1	5D MTH 3.2	5D MTH 3.2								
III         PPC den11         So den12         So den12 <th< td=""><td>12</td><td>G</td><td>5P CBD 1.1</td><td>5P CBD 1.1</td><td>5P CBD 1.2</td><td>5P CBD 1.2</td><td>5P CBD 2.1</td><td>5P CBD 2.1</td><td>5P CBD 2.2</td><td>2 SP CBD 2.2</td><td>5P CBD 3.1</td><td>5P CBD 3.1</td><td>5P CBD 3.2</td><td>5P CBD 3.2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	12	G	5P CBD 1.1	5P CBD 1.1	5P CBD 1.2	5P CBD 1.2	5P CBD 2.1	5P CBD 2.1	5P CBD 2.2	2 SP CBD 2.2	5P CBD 3.1	5P CBD 3.1	5P CBD 3.2	5P CBD 3.2								
1         1         201111	13	н	5P CBN 1.1	5P CBN 1.1	SP CBN 1.2	5P CBN 1.2	SP CBN 2.1	5P CBN 2.1	SP CBN 2.3	2 5P CBN 2.2	5P CBN 3.1	5P CBN 3.1	SP CBN 3.2	5P CBN 3.2								
K         Mono         K         Mono         Main           13         M <td< td=""><td>19</td><td><u> </u></td><td>CDNA POO</td><td>CDNA POO</td><td>CDNA POOL</td><td>SP MTH 1.2</td><td>SP MIN 2.1</td><td>SP MTH 2.1</td><td>SPMINZ.</td><td>2 38 1111 2.2</td><td>SP MIH 3.1</td><td>SPMIN 3.1</td><td>SP MTH 3.2</td><td>5P MTH 3.2</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	19	<u> </u>	CDNA POO	CDNA POO	CDNA POOL	SP MTH 1.2	SP MIN 2.1	SP MTH 2.1	SPMINZ.	2 38 1111 2.2	SP MIH 3.1	SPMIN 3.1	SP MTH 3.2	5P MTH 3.2	-							
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RAW DATA Real Time-PCR Results (5uM) TRIAL 3

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	C6		17.58						19.77	19.85	19.28	19.16	19.56	19.55									
	C7		16.42						19.96		18.72		19.72										
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RAW DATA Real Time-PCR Results (5uM) TRIAL 4 & 5

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Lid Temp		95									29.04	18.96	20	23 20.2	1	21.37	21.36								
Hate Setup P	Default Pr	rimePCR 384	unite pitd	opagini Panista							29.07	18.78	21	59 20.8	5	21.06	21.05								
Base Serial N	CT013778										17.93		25	.04		19.28									
Optical Head OFX Maedina	/16688289C	0									28.41	18.17	21	18.9		29.32	19.30								
											38.23	18.40	2	15 19.0	2	21.69	21.62								
Well group	All Wells										38.86	10.03	38	151		18.69	14.63								
Ampinisation Meltideo		-									29.20	19.00	20	141	3	19.00	18.67								
											38.85	18.85	58	154 18.4		18.78	18.89								
Ale II	filmer.	Tanan	Contract	famile	(a. (b. 1))	One Mails Tremer	Real Height	Bania Taman	Ford Terroritor	- 4147			4147		_	4445	0.14335683								
A05	STRR	in the	Ukkn	22100	18.88	87.00	453.06	82.50	92.00				114	10/10/11		ATS 2									
402	5188		Urkn		19.04	87.00	464.53	83.00	\$3.00	165	15														
403	5198		Urkn		18.45	86.00	638.39	81.00	94.50		794.6		(INDIA)			MTH DEE									
8.05	SYBR		Ukkn		17.93	86.50	656.63	82.50	\$8.00		-														
4.06	5784		Urkn		18.43	86.50	274.63	83.00	95.00		21.82		21	21	_	21.07									
ADE	SYBR		Utikn		18.23	86.50	539.83	81.00	93.00		22.59	4.51	21	.18 22.3	,	20.94	2035								
AD9	SYBR		UNKIN		18.86	85.50	206.42	80.50	\$4.00		21.99	22.29	21	13 22.0	2	20.86	20.88								
A30	5138		Ukkn		19.30	87.00	522.83	82.50	95.00		20.75	20.67	21	199	-	20.70	10.68								
A12	SYBR		Utikn		18.85	86.50	634.85	82.00	98.00		20.14	10.00	20	101		20.54	20.00				-				
A18	SYBR		Ukkn		21.80	81.50	543.80	76.50	92.00		20.97	20.56	2	46 20.4	5	20.74	20.64								
434	5186		Urkn		21.18	81.50	508.05	77.00	87.50		22.45	22.42	2	07 20.1		21.01	20.96								
A35	SYBR		Ukkn		21.01	#1.50	523.56	76.50	89.50		23.75		25	41		20.37									
A37	STRR		Ukkn		20.44	81.50	651.00	76.50	88.00		23.76	23.76	×	101 19.9	5	21.44	20.90								
A22	SHOR		Utkn		20.90	81.50	557.43	77.00	88.00	AVG	s *1	1.8990591	AVG	20.82142	5	AVG 2	0.8367106								
820	SYBR		Ultikn		20.16	81.50	584.46	77.00	91.00		_					_									
AJ1 AZ2	1786		Shin		21.00	81.50	561.16	76.50	91.50		140		CEVPRO			MTH PRO									
423	SHOR		Unkn		21.41	81.50	675.34	76.50	89.00		28.03		21	.67		26.30									
424	SYBR		Utkn		21.41	81.50	650.99	76.00	91.50		27.54	27.78	21	.50 25.9	2	26.22	26.26								
802	5195		Ukkn		20.23	87.00	453.70	82.50	95.00		25.75	25.62	21	79 25.0	5	26.19	26.24								
803	SHOR		Ultkn		20.14	87.00	496.65	83.00	94.00		27.44		20	.95		27.26									
101	3786		Shiko		21.59	None 85.50	None 663.46	None 82.00	92.00		27.31	10.32	20	59 26.9		27.31	17.28								
106	5185		Urikn		18.86	86.50	369.95	82.50	95.00		26.10	26.21	21	19 26.3	,	28.41	28.25								
107	SHER		Ukkn		18.87	87.00	445.04	82.50	\$3.00 54.50		24.99	25.30	21	43		26.46	16.00								
109	SYBR		Ukin		18.51	\$6.50	590.32	82.00	94.00		25.88		21	.84		26.41	28.00								
810	5198		Urkn		19.48	85.50	414.57	81.50	92.50		26.19	26.03	21	.05 24.9	5	26.49	26.45								
112	STRE		Utkn		18.41	86.50	582.98	82.50	15.00	AV5		5.3693088	AVG	25.842134	5	AVG 2	5 7981251								
813	SYBR		Shikin		22.54	81.50	435.64	76.50	87.00						_										
814	5198		Ukkn		22.27	81.50	470.98	76.50	86.50																
815	5785		Ukko		22.15	81.50	416.73	76.50	88.00	Fo	uneith														
< ▶	RP	S11 Res	ults	Myf5 M	lyoD Results	Myo	genin F	ollistatin	Results	Myostatin I	Results	۵	LA CT	ΔΔ CT (2)	Δ	△ CT (3)	Final resu	ilts	Final Resu	ilts (2)	Test1 L	ayout 1	est 2 Layou	t -	+

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210R	Ote Ote		10.40	81.00 84.90	414.57	01.50 1 82.50 1	85.90 86-90		26.19	26:00	21.05 24.25	2.4	2.84																
5190	Urie Urie		15.54	81.00	425.04	A2.81 1	06-30	^	v3 ***	0000	AVS SHEEK	AVG	24 TREUE																
2159	Chie .		20.27	81.00	471.98	75.80	K. 10																						
5100	Ute		22.5	81.00	443.15	75.91	15.50		CD 2 LAS																				
2109	Ote		20.82	e1.00	541.40	77.85	6.30		601.4																				
5199	Uter		25.63	81.90	663.71	75.50	14.00	2	10.077		ON OPF.	ACH GPP																	
0101	CHAR.		20.22	81.00	481.47	77.88	n 30		27.30		22.54	24.9																	
5100	Crise.		20.26	81.00	604.11	75.60	46.100 (4.50)		21.14	21.24	20.37 20.45	24.3	24.1																
5109	UHP.		13.81	81.00	101.40	79.51	1.50		in m."	21.02	12.51 22.03	23.9	- me																
\$199	Grie		2.37	87.00	673.12	10.55	1.00		20.68	26.93	25.66 20.97	21.0	2.4																
2100	Urie Urie		2.0	87.00	481.54	02.51	e 10 10 00		20.95	20.32	22 25	21.0	219																
2159	Urben (Date		13.28	87.00	587.63	82.50	16.00		21.87		20.20	21.0																	
5100	Ute		17.55	<b>M</b> .90	501.41	02.00	H 20		2.4		19.57	21.9																	
2104	CHM CHM		18.48	86.00	408.12	62.50	8.30		2.4	21.4	10.007 10.00	2.5	- 83																
5100	Use .		15.65	87.00	#13.15 #83.95	42.51	10.50	^	vs *xxx	20194	AVS PARADON	AVG	22.4440																
2159	Crise .		18.79	87.00	818.12	62.80	06.90		697.6																				
5100	Union .		24.14	81.00	518.67	77.88	16.50 16.50		0.077		004077	NO1077																	
0109	Chie Chie		22.87	#1.50	427.68	77.80 s	NC 30				34.11	24.0																	
5199	Ute		25.66	81.00	541.12	75.51	6-30		26.06	26.16	23.60 24.00	21.6	23.8																
2101	010		214	P1.00	171.40	7.0	10.00		2127	27.00	218 218	24	2.14																
12/04/3	Grie .		23.48	81.60	373.01	75.00	NC NO		2.4		22.18	23.4																	
0109	UHP.		21.09	e1.00	545.71	71.51	10.50		10.00		2.12	23.5																	
5199	Grie		2.4	81.90	535.68	75.50	16.90		27.11	1.0	20.31	21.0																	
0100	Use		2.52	87.00	419.20	02.51	6.50		22.10	17.00	22.57 22.44	21.5	2.00																
2599	Cale.		22.53	87.00	311.00	10.10	10 KO		26.66	26.00	21.86 21.88	22.4	2.4																
5100	Une.		20.73	87.00	543.00	02.51	6.20		va * m	1935	AVG ZO STITES	AVD	10.0410																
2109	Ote .		20.40	87.00	543.60	82.50	00.30		0.000		200.002	1000																	
5100	Urie .		20.67	Acre Her	ne Ner	w Nere																							
2158	Geo.		20.37	86.00	546.44	62.50	E-30		22.85	27.27	27.22 27.20	21.0	2.8																
5100	Union .		23.5	87.00	488.50	82.51	4.50		10.00	27.18	20 22	24.5																	
0109	Chie Chie		2.2	81.00	494.38	71.51	10.00		27.58	17.46	2.3	28.1																	
51895	Uter		2.0	81.50	488.74	75.58	6-X)		21.67		25.56	28.7																	
0101	Ote		25.4	RT.SO	43.65	10.50 Nore	17.30		20.00	27.60	27.82	26.7																	
5100	Urier.		25.44	81.00	525.64	77.88	00.00		25.85	26.80	26.66 27.25	24.7	213																
0101	UNE		22.00	e1.00	548.57	77.88	10.00		27.30	27.30	8.0 8.8	8.3	2.88																
5199	Union Union		27.88	81.90	513.57	75.51	8- X0		us *273	00545	AVG DEFENSES	AVG	27.339538																
5100	Urie Urie		21.11	#1.50 #1.50	401.00	77.88	M-30																						
2158	Griev.		20.31	87.00	674.06	10.10	10.00		AN POOL		NTC																		
5100	Ute		22.51	87.00	398.40	02.51	0.50		vogenin																				
5199	Ode Ode		13.85	87.00	40.50	10.10 N	8.30 85.30		20.53	20.10	20.15																		
5150	Union		22.44	87.00	521.47	42.81	8-30 M-70		-																				
2168	Gite		23.46	87.00	40.61	60.00	15.10	- 1	23.80		6.17																		
5100	Unio		25	87.00	500.15	02.51	6-XX		10.00																				
2109	Ole Ole		13.81	85.50 87.00	581.62	82.50	E 20		21.28																				
5199	Unio		24.11	81.90	454.75	77.68	6 X		21.0	4.8																			
2101	Ole		20.72	81.00	488.00	75.80	8-00																						
5100	Urie Urie		23.66	81.00	67.6.05	75.50	ME-90																						
0101	Ote		23.11	£1.00	281.04	7.00	10.00																						
1000	(bite		2.0	#1.60	10.00 M	and a																							
•	<b>RPS11 Res</b>	sults	Myf5 My	yoD Res	sults	M	yogenin	Follista	atin Res	ults	Myostatin	Results	Δ	Δ CT	001	CT (2)		CT (3)	Final re	sults	Final Re:	ults (2)	1	fest1 La	yout	Test	2 Layout		1
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۰,	Cut	0	alibri (Bo	dy)  + 11	• A	• A•	=	= _	***	E.	Wrap 1	fext =	Cust	om					-		<b>.</b>		Σ AL	itoSum *	<b>A</b> ₹₹	Q	
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9	‡ >	$\sim$	fx 31.2	466661203	3416																						
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NamSlau_1	151_July 31	Myostatin.po	d							Myostatin																	
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Star 07/81	2018 15:22	an unc								CHD 299		CRN DOIN	MTH	29													
npie 1 3	12									28.17		27.96	28	70													
Temp 1	15									27.64 27.1	90	28.17 28.06	28	94 28.8													
tocol dau_e	der graan pn	otocsi_Myosta XM, coolia oli	tin_july 22.prd							27.56		27.84	28	56													
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cal F 7860R	2890									27.14 26.1	13	27.60 27.81	28	26 27.8													
444.1.26	18.1219.									27.62	60	25.787 27.06	28	00 02 7 29.0													
pro All We	ila .									27.37		27.18	26	45													
fici de	3									27.21 27.2	29	28.41 27.79 25.69	26	36° 26.6 39													
										27.71 27.1	64	26.69 26.69	36	967 26.9													
flue	Target	Content 5	mpie Ca	Starting Q	uantit Melt Terra	or Peak Height	Begin Temp	End Temperate	<b>re</b>	ANG 27.44	48	AVG 7 27.66	AVG	27.92													
SYBR		Linko		27.64	82	50 283.35	68.00	85.50		T857 5																	
SYBR		Unkn		27.56	82	50 263.97 30 294.29	68.50	85.00		080 0181		Can Dill	MTH														
5788		Unico		26.52	Sone 82	None	68.50	84.50 None		29.54		29.40	25	86													
5138		Unkin		27.32	82	50 314.85 50 317.82	68.50	85.00		29.43 29.4	49	29.91 29.65	25	34 29.50 M													
SYBR		Linko		27.87	81	50 253.28	67.50	84.50		81.25 81.2	12	29.72 29.83	28	95 29.00													
SYBR		Unkn		27.96	81	50 234.40	67.50	84.50		2.447 21	17	267 22	2	47 23.5													
3786		Chikin		17.71	None	None None	None	None		29.48 29.3	57	29.20 29.65	23	11 29.5													
519R		Unko			None	None	None	None		30.69	19	23.67	23	57 23													
5128		Unko			None	None	None	None		20.50	10	29.95	28	12 447 78 80													
5188		Unkin			None	None	None	None				4147 F 30 470	4147														
STER		Christon			None	None	None	None																			
SYBR		Unkn			None	None	None	None				Control/															
SYBR		Unko			None	None	None	None		29.72 29.17 29.1	66	28.11 28.44 28.37	22.	44 28.5													
5188		Unko		27.96	None	None 00 229-21	None	None 93.50		30.85	17	28.50	31	83 88 1 31 80													
STRR		Cirkin Linkin		27.84	82	233.29	70.00	94.00		28.79		29.21	28	18 08 7 18 1													
SYBR		Unkn		28.01	82	50 294.08	68.50	84.50		29.64		28.60	25	43													
SYBR		Linko		27.85	None	None	None	None		28.60		30.33	28	60													
519R		Unkn		25.78	N. 66.	00 243.64 50 251.48	- 83.5C 64.0C	92.50		29.45	50	28.71 29.52	28	30, 28.9													
5788		Unko		28.41 25.69	None 86.	None 80 831.46	None 83.50	None 92.00		29.13* 29.2	29	28.11 28.19	28	20 28.2													
SYBR SYBR		Unkin		25.69	None 85.	50 362.33 None	83.00	92.00 None		AVG 29.1	99	AVG 28.733	AVS	29.8													
STRE		Union			None	None	None	None		1000 BOOK		100															
SYBR		Unkin			None	None	None	None																			
SYBR		Christon			None	None	None	None		27.41		82.98															
519R		Unkn			None	None	None	None		0.0 10	*	35.07															
3788		Unico			None	None	None	None		23.45																	
SYBR		Unko			None	None	None	None		23.36* 23.3	52																
SYBR		Links Links		28.70	None	None	None	None																			
SYBR		Unkn		28.56	81	274.08	63.50	93.00																			
SYBR		Christon		27.47	81	50 278.56	68.50	92.50																			
519R		Unkin		23.00	81.	50 245.67 50 274.37	7100	95.00																			
5188	-	Linko Linko	_	29.02	None	None 90 233.75	None 84.00	None 91.00		_	-		_	-	-	_	_	_	_				-				
	RPS1	1 Result	s M	d5 MyoD B	tosults	Myoa	enin Eo	Ilistatin B	esulte	Myos	tatin B	esults	AA CT		AA CT	(2) /	A CT (3)	Final re	eulte	Final Res	ults (2)	Tost1 I	tuove	Tost :	2 Lavout		-
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Real-Time PCR Analysis Fold Change (5uM) TRIAL 3













Real-Time PCR Analysis Fold Change (5uM) TRIAL 4 & 5



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lome	You	Diaw	Page Lay	out Form	iulas	Data	Review	VIEW					-							T. Lutatum		m. Juai
٩.	on cut	Calibri	Body) - 1	2 • A*	A-	= _	= 🌮	•	Wrap Text *	Gen	eral	*		• 📝•	1.	4.000	- 🗰	× - 🎁	<u>.</u>	Z Autosum	Č Agγ	Q.
ste	S Format	BI	<u>U</u> •	· 🔺 · .	Α.		-	•	Merge & Cente	• \$	• % • *	00, 0. • 0	Condition	nal Format	Cell	Insert	Dele	rte Fo	rmat	Fill * Clear *	Sort &	Find &
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A	8 C	D	£ F	G	н	1	1	к	L	M		P	q	8		т	U	×.	W	х	Y	. AA
	y6	CEN DIFF	P\$11																			
29.35		25.70																				
29.39	831	25.82	15.16		1.5545	1483/2400050		1.4790303430575	0.3585	1575400345	51 0.4305252109483											
29.31	29.39	25.97	26.23		3.6673	306526485050		0.9928485470783	4 0.5024	465786326												
27.33	27.98	24.41	24.85		1.6766	669716088900		0.7183505571148	6 0.6077	1193709683	11 1003030041130											
25.73	25.85	23.47	23.34		2.4646	603819782800		(0.4987153392911	1.4080	637133846	1 100 110 110											
27.39	27.30	24.01	24.00		1.000	124493404130		0.1283965339946	1.0852	038643249												
24.85		22.60									53 0.87072171347235											
26.84	20.84	0.0	22.91		(3.3785	10100100		0.6300741306765		00000421												
66 M	y6	ALCON.	P\$11																			
28.36		24.81																				
28.03	28.30	29.93	27.57		0.8292	228621996048	2.07645797340663	(1.1452293520006	2,305	237136988	51 1.8962036030428											
28.04	27.90	24.48	24.58		3.3196	687325417300		1.2452293520006	0.4218	083073484												
27.35	27.87	24.68	24.68		3.1816	600006007000		0.2232905470930	0.8566	1518269017												
27.84	27.78	24.49	75.04		1 100		2.95831915897398	10 22220064270320	1100	53235556	52 1.0120002536713											
27.71		24.41																				
27.67	27.10	25.85	34.13		13402	712282379900	3.31892202739878	0.1647912549771	0.8828	913511034	53 1.01689067563222											
26.88	26.97	23.60	23.92		3.0541	129772421650		0.2647912549771	1.2004	219615411												
10 M	y6	C60 MIQ	P\$11																			
25.75		23.54																				
25.68	25.71	23.29	23.44		2.2765	535374171700		0.1276858540238	5 0.9152	845211679												
24.50	24.58	22.45	22.49		2.000	971656493150		0.0618778636547	1.0438	355538283	51 C379563003649E											
27.16	M 14	22.04	22.44							4438834673												
26.05	20.33	23.59	20.11		1.1/1	11100401100		0.011004011001	0.074		52 0.9308342874017											
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24.18	24.35	22.89	22.48		1.3236	622888595650		0.0308694799237	R 0.9924	H16129630												
25.36	25.17	23.10	23.88		1 2104	483821608050		0.4222596870598	1.3400	407537179	53 13962941112942											
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····································	21.16	21.03		23.22	23.49				0.46238251	\$332560			4.192545923	729150	0.054693258736	2						12		1.38721383	σ	0.717	56806	1.097724	23			
····         ···· </td <td>21.55</td> <td>21.54</td> <td></td> <td>21.80</td> <td>13.26</td> <td></td> <td></td> <td></td> <td>D 1985AUST</td> <td>*****</td> <td></td> <td></td> <td>4.436402338</td> <td>602350</td> <td>0.046285044850</td> <td>5</td> <td>8 0</td> <td>0.05043860160425</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1 22006262</td> <td></td> <td>1.264</td> <td>12858</td> <td>1 116201</td> <td></td> <td></td> <td></td> <td></td>	21.55	21.54		21.80	13.26				D 1985AUST	*****			4.436402338	602350	0.046285044850	5	8 0	0.05043860160425						1 22006262		1.264	12858	1 116201				
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1       0	20.60	20.54		23.99	23.59				0.055635170	3880001			(2.412582505	236400)	5.324265465656	15																
m         m	20.21	20.17		23.29	23.47				0.101245272	2361501			3.353683309	436750	0.097822944190	5		10077240001167														
Control         <	22.46	19.68		22.89	23.56				0.4799405103	3803501			3.174988065	292550	0.110723855831	14																
Total         Total <t< td=""><td>No.</td><td>60</td><td>9614</td><td>0#</td><td>Pi11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	No.	60	9614	0#	Pi11																											
No.         No. <td>25.40</td> <td></td> <td></td> <td>23.60</td> <td>12.44</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>- [</td> <td>1414700480</td> <td>100400</td> <td>0.336766670383</td> <td></td>	25.40			23.60	12.44							- [	1414700480	100400	0.336766670383																	
1         1	23.56	23.14		25.28	14.83					******	0.38259628115	6750	0.614595689	1924000	3.067253685712		1 1	1.69443706804725														
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1         1	20.06	20.15		16.33	14.57								0.707518603	110000	0.61106070687																	
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And         And         And         Parameters         Parameters <th< td=""><td>25.53</td><td>26.60</td><td></td><td>24.32</td><td>24.83</td><td></td><td></td><td></td><td>1.7734333200</td><td>332150</td><td></td><td></td><td>2.246547512</td><td>811090</td><td>0.210727789722</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	25.53	26.60		24.32	24.83				1.7734333200	332150			2.246547512	811090	0.210727789722																	
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ane ne μe	26.35	26.56		25.85	26.09				0.266383536	340351			0.470683398	590075)	1.385763823004	10	8 1	22006761755344														
P         RPS11 Results         Myd5 MyoD Results         Myogenin Follistatin Results         Myostatin Results         ΔΔ CT         ΔΔ CT (2)         ΔΔ CT (3)         Final results         Final Results (2)         Test1 Layout         Test 2 Layout	28.09	28.41		27.64	17.75				0.000081835	327904		L	0.076383159	2083225	1.054373412100	18																
	•	RPS1	Results		My15 I	MyoD R	lesults	M	lyogenin	Follist	atin Resu	ilts	M	yostatin R	lesults /	LA CT		ΔΔ CT (2)	Δ	1 CT (3)	8	inal result	ts	Final R	esults	(2)	Test1	ayout	Test :	2 Layout		+

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	26.36	25.97	26.23			0.137681829168000		0.63079543258	6876	0.6548355575803	,												
24.57	24.39	24.41	24.31			0.083431903799301		0.06939213923	5402	0.9530394642267	8												
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26.43	25.90	24.48	24.58			1.325736467896650		1.79885087131	5520	0.2874084388264	8												
25.50	25.33	24.68	24.68			6.646772039707297		0.63273227534	3399	0.6449538000605													
24.34	21.44	24.46	21.04				0.01403976456389	9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1100	1.0004040000000000000000000000000000000	52	1.09772622789388											
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24.79	24.89	22.53	22.49			3.400745135543750		0.06475297200	7323	0.9694557994965	51	0.87886491481455											
25.88		22.94																					
24.10	26.03	23.39	20.0			2.516651472515050		0.55612454727	55971	1.51/7555400465	52	1.36711086296876											
26.40	26.15	23.49	23.44			2.814728966926600		(0.50225765326	805.0	1.4364283778893	4												
24.00	24.22	22.39	22.48			1.730797280893400		0.14079394131	9346	0.9070298684365	7												
25.09	25.30	24.66	23.88			1.324570857283650		(0.26543238229	06021	1.2009962293097	1 33	105450805386334											
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Nort         Nort <th< td=""><td>18.85</td><td>18.85</td><td></td><td>23.75</td><td>23.76</td><td></td><td></td><td>14</td><td>#996016969900</td><td>4)</td><td></td><td>3.2382083</td><td>\$5772200</td><td>0.</td><td>10597505675127</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1.000,000</td><td></td><td></td><td></td><td></td></th<>	18.85	18.85		23.75	23.76			14	#996016969900	4)		3.2382083	\$5772200	0.	10597505675127													1.000,000				
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and       and       and       Andersonant       Andersonant <td>20.18</td> <td></td> <td></td> <td>25.30</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td>CBD pr</td> <td>re</td> <td></td> <td>CBN pro</td> <td></td> <td>Mitk pro</td> <td></td> <td></td> <td></td> <td></td>	20.18			25.30						1													CBD pr	re		CBN pro		Mitk pro				
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Martine	21.59	20.86		25.77	25.85			54	\$450052169250	0		(1.9843323	6468050	3.2	95673972159105						52			1718589276		1.5933390		1.00572894				
1       1	18.85	18.95		23.55	23.81			54	8617107111936	0		(1.3714045	58847970	2.5	58722398550033		3 2554933934	201			53			3.00674696		5.6380838		1.00004533				
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Mode         Mode <th< td=""><td>18.54</td><td>18.48</td><td></td><td>22.89</td><td>23.16</td><td></td><td></td><td>14</td><td>4815072332154</td><td>e1</td><td></td><td>3.4566979</td><td>19552250</td><td>0.</td><td>09108152014847</td><td>55</td><td>0.0845243113</td><td>0.76</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	18.54	18.48		22.89	23.16			14	4815072332154	e1		3.4566979	19552250	0.	09108152014847	55	0.0845243113	0.76														
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No.         No. <td>21.06</td> <td>21.05</td> <td></td> <td>24.87</td> <td>24.83</td> <td></td> <td></td> <td>14</td> <td>#144214380970</td> <td>0</td> <td></td> <td>(0.8587283</td> <td>876400481</td> <td>11</td> <td>80716519128682</td> <td></td>	21.06	21.05		24.87	24.83			14	#144214380970	0		(0.8587283	876400481	11	80716519128682																	
And         And <td>19.32</td> <td>19.30</td> <td></td> <td>23.51</td> <td>23.53</td> <td></td> <td></td> <td>54</td> <td>8284357678887</td> <td>0 49030</td> <td>CTC214493W</td> <td>(0.5381300</td> <td>155438251</td> <td>1.</td> <td>45208913634625</td> <td></td> <td>1/202260471</td> <td>952</td> <td></td>	19.32	19.30		23.51	23.53			54	8284357678887	0 49030	CTC214493W	(0.5381300	155438251	1.	45208913634625		1/202260471	952														
And A	21.69	21.62		23.95	24.57				\$521757368011	-		0.5381300	15543825	0.	68866295815279																	
1         1	18.65	18.67		25.45	26.09				4192930022282			0.7385320	50535450	0.	60772390605967																	
Image: Provide the state of	18.78	18.89		27.86	27.75			54	#563171032981	ga 13780	avas (48650)	(0.7185120	50525450	1.	64548405950286		1.12980398077															
Mark         Mark <th< td=""><td>-</td><td></td><td></td><td>137.6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	-			137.6																												
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n n n n n n n n n n n n n n n n n n n	22.59	22.39		25.28	24.83			54	5363615131064	0		2.5287714	84564750	0.	17432052550414	51	0.1380042782	588														
AR A	20.73	20.62		23.35	23.53				6612133242400			1.541803	99582250		34344017315247																	
ARE	20.14	20.54		25.18	24.57				#168845222****			0.190234	15435562		83546079536747	52	0.6099504841	269														
No.     No.     No.     No.       Ana     No.     No.     No.       No.     No.     No.     No.       No.     My55 My60 Results     Myoganin Folistatin Results     ΔΔ CT     ΔΔ CT     ΔΔ CT (Δ)     Final results     Final Results (2)     Tost Layout     Tost 2 Jayout	22.47	10.35		24.33	20.07							10 1000																				
Am     Am     Diff     Diff     Diff     Diff       p     RPS11 Results     MytS MytO Results     Mytogenin Follistatin Results     Mytogenin Follistatin Results     ΔΔ CT (2)     ΔΔ CT (3)     Final results (2)     Test1 Layout     Test1 Layout     -	23.75	22.42		25.85	26.09			P4	8084399465585	1		0.5603655	1/1/28	D D	*3011800903999	53	1.6829182937	597														
RPS11 Results Myd5 MyoD Results Myogenin Follistatin Results Myostatin Results ΔΔ CT ΔΔ CT (2) ΔΔ CT (3) Final results Final Results (2) Test1 Layout Test 2 Layout	23.36	23.76		27.64	27.75			14	**16012262264			10.9025073	220635721	11	8.7560807757236																	
	•	RPS	11 Resu	ults	My15 My	/oD Resi	ilts	Myc	genin Fol	istatin F	Results	1	Ayostatir	n Results	Δ.	7 CT	AA CT	2)	ΔΔC	T (3)	Final	results		Final Re	sults (2)	1	fest1 La	yout	Test 21	Layout		+

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21.99	22.39	24.37 24.83	2.536361513106458	2.5	29771484564750	0.134330575504	14											
20.60	20.67	23.31 23.33	1.665253768240900	15	41869289582250	0.343440173352	52	0.60993068416269										
20.97	20.56	23.95 24.57	4.016884522387200)	0.1	90238535435549	0.875460795352	12											
22.32	23.43	25.85 26.09	1.6684503465522223	(0.5	8036559827272281	1.495228509939												
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22.13	22.07	25.97 26.23	54.1557788105883000	0.5	00354387082899	0.5357553852995	18											
20.44	20.31	24.20	4.0000536500705580	0.1	36270406752601	0.922569557687												
20.35	20.41	23.21 23.47 23.34	L 9359413288899581	11	71181728916300	0.434320259346	52	0.66864490841702										
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20.90		24.67		(5.056132997671200)			51	2.47634633048516										
20.70	~**	24.69	0.00010000		37517972259700	0.590255208180	~											
20.67	20.69	24.68 24.68	\$1.997¥7664541#50E	(4.207123057823150)	09346432454649	0.864968937801	52	1.01053654387027										
20.74	20.64	25.63 25.06	(4.416369470227808)	(0.3	09246432434649	1.1560841489388	13											
20.51	20.96	23.43 24.12	1.560079526848350	0.0	01985563026475)	1.0511623903385	10 55	1.00124509313585										
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28.03		23.59																
25.51	27.78	22.53	4.342765816608400	0.1	23901278648151	0.7989065824990	51	1.32674276250911										
25.75	25.63	22.45 22.49	1.127772858657150	10.1	810916799033306	1.854578942518	н											
27.35	27.37	23.28 23.15	4.251144141514500	0.1	54995627887601	0.8981350946938	8	1 21353827550062										
26.10	26.31	23.49 23.44	1.3676(1732339350	(1.3	38534780687650	2.538943456307	11											
25.45	25.30	22.39 22.48	2.715406584545400	(1.3	80223471385550	2.4287659516680	99											
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25.50	25.59	22.66	22.84		1.19	0135412971500		(1.268)	729124568750	2	40949219029785															
25.79	25.60	22.06	22.00		3.60	1921347597200		(0.4345	942590363051)	1	33324562175521		1.87195890003													
24.54	26.97	22.76	22.88		4.00	6799556554300		(0.0293	3493634726999	1	01350230047205		1 10111004.000													
26.10	24.39	22.41	22.78		1.45	3473140494350		(0.452)	675373132948)	1	36857582945063															
25.45	25.56	22.78	22.78		1.77	9473514267400		(1.2363	2465414635503	2	32345447711333		5.63808387853	40												
25.05	24.95	21.90	24.11		0.83	3389270965554		(3.1622	330754355400	8	95274938196205															
740 MV	operin	WTEPRO RPS11																								
26.30	26.36	22.36	22.31		3.89	0051403309550		(0.0688	803134650601)		.04884619575882															
26.39	26.14	22.52	22.15		4.00	7667572510850	4.01886453796	0.0688	803134650601		95342863832124	51	1.00113341693	20												
27.36	27.38	23.10	23.03		4.39	05030862235600		0.1543	154572504599		89853426581168															
28.10	28.36	24.13	24.20		1.85	17939411232400	4.10614851362	(0.1543	154572594599)	1	11292361131785	52	1.00572893856	18												
26.46	24.30	22.49	22.83		1.88	1883543823700		(0.0187	796511907251]	1	00956689746938															
26.45	26.45	22.63	22.44		4.00	9456567538200	3.9957200557	0.0131	796511907251		9905237507400	53	1.00004532910	70												
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9.07 Not	late in the second s	C60.077 MPS11														51		5.31974	991	7.967212	42	1.25877224				
21.30		23.90										1				52		2.364838	562	2.785477	36	1.04640707				
21.18	21.34	22.67	14.09		0.85	08568875142003		(2.5053	1149843006509		6775393344283	51	5.31974990969	12		sa		0.085793	m	0.170923	23	1.32942637				
20.44	21.02	23.65	13.68		1.45	65762864555550		(2.53/5	9683836403009		96210044496228					Falls	tatin			TEST S	-					
20.90	20.25	23.10	10.12					(1.200)				52	2.96483856213	10				CRD diff		CBN diff		MTH diff				
21.07	21.13	23.22	12.46			*****		3 5310	100067866330		ALLEST CALLSON					51		0.051316	733	0.945442	74	1.35638312				
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	in the second se	(An (2)) (2001)														53		0.2076	891	1.037364	22	1.00933342				
22.54		25.10																CBD pro		CBN pro		MTH pro				
22.37	23.40	25.63	25.46		1.05	5124244514458)		(2.7095	5023417989003		54095977270815	51	7.96721241421	*		51		1.253088	307	0.997787	72	1.00008277				
22.35	22.33	25.77	25.85		0.57	7279343421850		(8.2316	6574396063003		39946507572191					52		1.353339	912	1.30089	64	1.00277935				
20.90	20.91	23.55	23.81		0.90	3192914061550)		(1.4723	725450094300	2	77353485030768	52	2.78847736064	16		53		1.451559	911	2.853435	94	1.00000425				
20.72	20.67	23.39	23.59		1.91	8675594795858)		(1.487)	1981268284009	2	80343987107463															
20.36	20.35	23.79	23.47		14.31	9501840953600)		2.6865	558683090200	°	15533254411021	53	0.17032312589	19												
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054 21.66 055 21.36	21.46	23.35		869318254703150)		(0.43784078673	1.1545754806803															
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031 25.48 032 25.44	25.46	25.55		100604345738250		3.69640891165	0.0771382960652	· .														
684 23.66	21.65	28.05 24.57		466188393873350)		(1.10047382696	2.1442510897183		1.11007401007110													
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512 23.40	23.45	24.68 24.68		272639198796100)	C 14571414141011500	0.29907536711	0.8351604084064		1.00000487314084													
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27.56	17.64	12.54		0.3674		1 1783200181473													
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27.31	26.89	13.10	4.4080908-41450900	d.dzbie.k	99172150	0.9859130350731	53	1.45155591142546											
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27.19	27.21	22.81	A 368460671851650	0.155885	950221975	1.1141054587864													
26.80	34.70	21.92	C 10000011110000	0.183036	17146952	0.8814689645140	51	0.99778772415024											
27.36		22.87																	
26.56	17.55	21.06	4,6,7(3,7(3,76)3)6400	0.15255	131860779()	10965196099954	52	1.80189140161222											
27.34	26.95	12.41 12.75	4.111370632096150	0.592931	57488349(	1.5072631932290													
26.56	27.21	22.78 22.78 26.32	4.427606873778050	0.039982	23399301	0.9726657862048	53	2.85343934050057											
26.25	26.26	21.80 24.11	2.144488365691800	(7.243136	84686950()	4.7342128947962													
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25.99	36.93	22.36	A CUMERIALISING	0.015578	ANC318980	1.0081282284553													
26.74		21.98	453	24346480973850			51	1.00003275753324											
28.11	28.69	23.50	1.51003627605750	0013879		0.9919073138111													
28.00	28.06	22.457 23.42 24.13	5.033782042477900 4.80	0.2302989584500	52892499	0.8523984926976	52	1.01277925445955											
28.99	28.68	24.48 24.30	4.572901936092000	(0.230400	52892499()	1.1731602162214													
26.70	26.70	22.54 22.32	4.383417208236600	(0.004205 87622950878250	42142151)	1.0029154536306		1.00000426929360											
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28.47 28.7	.50	24.68 24.68		4.815828401511800		0.162353972271474	0.892565894	10407												
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29.17 29.	.44	23.29 23.44		6.005160043064750		(1.963459661682420	3.899960904	15670												
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28.50	.4)	22.08 22.00		6.436618223117950		(1.532001481629220	2.091067555	1 10070	51 4.34004057472488											
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28.75 29.7	.12	22.78 22.78		6.737530541283400		0.702224570886175	0.636628753	13136	53 2.25187290333685											
28.11 28.1		21.90 24.11		4.075462300346200		(1.999443770001020	3.889120053	14235												
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27.64	54	22.36		6.310121641148810		11 73605061198330	1.11/00/01/01	10122												
31.83	**	21.98			7.968619704747180	1 738008061108330	0.10070400	1	\$1 1.81785775916782											
29.18		23.10				1.1.000001598330	0.19976460													
29.43	.34	24.13		6.1152#104/9##000	5.771864408245900	0.343435629042303	0.7817252	1	52 1.02846513854875											
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28.56 28.1	.58	22.14 22.83		4.366328594851700	6.035305970397230	0.230922624454479	0.852089793	17558	53 1.01283751389661											
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29.35	28.55	25.77	25.81				2.739534923128	950		(1.81565542	743000	3.520195134365	18						52		0.991773073		0.75474784		1.02846534				
7.60	27.85	23.55	23.81				3.993826933779	700		(0.46634834	353099	1.381512146620	12	1 1 64	PERMANANA				53		1.270075743		2.2518719		1.00283751				
8.78	27.66	23.36	23.59				3.468048756030	200		(0.99202642	512901)	1.988975757253	10		5200091291														
28.45	27.79	23.76	22.47				4.326707915533	800		4.57377842	081270	0.041990930587	15																
26.65	26.69	23.43	23.16				1.520333372456			3.77640288	305180	0.072977579664	12	5 440	5748425512809														
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28.70		23.60								0.000000000		0.0000000000000000000000000000000000000																	
28.56		25.28	23.48					4.555194	325871350	0.19922296		0.174018011004	5	1 1.22	341110515691														
12.42	28.58	23.35	24.83				1.755971585452	100		0.79922294	410.00	1.743163396649																	
9.15	27.85	23.51	23.53				4.479948732598	4.460075	180542800	0.02987355	055900	0.986339148654	5	2 1.00	009488089823														
29.62	29.01	23.95	24.57				4.440201628486	100		(0.02987355	0559000	1.013830613141	17																
26.89	26.42	25.85	26.09				6.330503503253	81.247070	533248474	0.57757365	502175	0.670089834663	5	3 1.08	\$121353884718														
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29.46	29.67	23.35	23.33				6.340528119547	500		1.68705369	007350	0.332560512633	25																
29.44	29.57	25.19	24.57				4.996447752243			0.34297332	903577	0.788434752620	5	2 0.54	1948753262664														
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Myf 5 pro	1	Title	1.780391147	0.624675977	6	1.205273639	0.773882243	6	1	1		6				
MyoD diff	2															
MyoD pro	3															
Myogenin diff	4															
Myogenin pro	-											_				
E Follistatin diff	5															
Follistatin pro	6	Title														
Myostatin diff	7	Title														
Myostatin pro	8	Title														
New Data Table	9															
Info »	10															
<ol> <li>Project info 1</li> </ol>	44															
New Info												_				
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one-way ANOVA of Myf5 diff	13															
one-way ANOVA of Myf 5 pro	- 14	Title														
one-way ANOVA of MyoD diff	15	Title														
one-way ANOVA of MyoD pro	16															
one-way ANOVA of Myogenin diff	17															
one-way ANOVA of Myogenin pro	18															
one-way ANOVA of Follistatin diff	10											-				
one-way ANOVA of Follistatin pro	19											_				
= one-way ANOVA of Myostatin diff	20															
= one-way ANOVA of Myostatin pro	21	Title														
(+) New Analysis	22	Title														
imily »	23	Title														
Myogenin pro	24															
one-way ANOVA	25															
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Myr5 pro     Myr0D diff     Myr0D diff     Myr0D pro     Myr0p pro     Myr0penin diff     Myr0enin pro		Mean	SEM	N	Mean	SEM	N	Mean	SEM	N		Mean	SEM	N	N
MyoD diff     MyoD pro     Myogenin diff     Myogenin pro	1 Title	0.872487712	0.119756880	6	0.783580216	0.091602383	6	1	3e-001		6				
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E Follistatin diff	0 1100														-
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λ• Search	Ta	ible format:		Group A			Group B			Group C				Group D		
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E Myf 5 pro	1	Title	1.369508788	0.439189729	9	0.916963473	0.369532306	9	1	4e-001		8				
E MyoD diff	2	Title														
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E Follistatin diff	5	Title														
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🔛 Myostatin diff	7	Title														
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one-way ANOVA of MyoD diff	15	Title														
one-way ANOVA of MyoD pro	16	Title														
one-way ANOVA of Myogenin diff	17															-
one-way ANOVA of Myogenin pro	10															
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one-way ANOVA of Follistatin pro	19	Title														
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amily »	23	Title														
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Myogenin pro	3										
E Follistatin diff	- 4	ANOVA summary									
Follistatin pro	5	F	0.08400								
Myostatin diff	6	P value	0.9197								
Myostatin pro	7	P value summany									
New Data Table	-	Circlineard diff. among manage (D = 0.05)2	hia								 
Info »	0	Significant diff. among means (P < 0.05)?	INO								 
(i) Project info 1	9	R squared	0.007251								
(+) New Info	10										
Results »	- 11	Brown-Forsythe test									
one-way ANOVA of Myrs diff	12	F (DFn, DFd)									
one-way ANOVA of Myr 5 pro	13	P value									
ane-way ANOVA of MyoD and ane-way ANOVA of MyoD are	14	P value summary									
I one-way ANOVA of Myod pro	15	Are SDs significantly different (P < 0.05)?									 
ane-way ANOVA of Myogenin and	16	vice obs digrationally different (i = 0.00).									
ana-way ANOVA of Follistatio diff	10										 
one-way ANOVA of Follistatin pro	17	Bartlett's test									
one-way ANOVA of Myostatin diff	18	Bartiett's statistic (corrected)	1.340								
one-way ANOVA of Myostatin pro	19	P value	0.5117								
New Analysis	20	P value summary	ns								
	21	Are SDs significantly different (P < 0.05)?	No								
amily ×	22										
	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value				
I One-way ANOVA	24	Treatment (between columns)	0.1110	2	0.05548	F (2, 23) = 0.08400	P=0.9197				
	25	Residual (within columns)	15.19	23	0.6604	. (2, 20) - 0.00400					
	20	Tetel	15.10	25	0.0004						 
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Q <del>v</del> Search										
Data Tables     W     Myf5 diff		Ordinary one-way ANOVA Multiple comparisons								
Myn o pro										
MvoD pro	1	Number of families	1							
Myogenin diff	2	Number of comparisons per family	3							
Myogenin pro	3	Alpha	0.05					-		
Follistatin diff	4	• •								-
Follistatin pro	5	Tukey's multiple comparisons test	Mean Diff	95.00% CLof diff	Significant?	Summany	Adjusted P Value	-		
🖽 Myostatin diff	6	CBD vs. CBN	0.1543	-0.8051 to 1.114	No	ne	0.9148	A.B		
Myostatin pro	7	CRD va. NTH	0.05109	0.00370 to 1.114	Ne		0.0008	1.0		
New Data Table	-	CDD VS. MTH	0.03108	-0.9379101.040	140	115	0.9906	A-0		-
Info »	8	GBN VS. MTH	-0.1032	-1.092 to 0.8857	NO	ns	0.9631	B-C		
Project info 1	9									
New Info	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1	n2	q	DF
Results »	11	CBD vs. CBN	1.051	0.8968	0.1543	0.3831	9	9	0.5697	23
ana-way ANOVA of Myf 5 pro	12	CBD vs. MTH	1.051	1.000	0.05108	0.3949	9	8	0.1829	23
one-way ANOVA of MynD diff	13	CBN vs. MTH	0.8968	1.000	-0.1032	0.3949	9	8	0.3698	23
one-way ANOVA of MyoD pro	14									
ane-way ANOVA of Myogenin diff	15									
a one-way ANOVA of Myogenin pro	16							-		
e one-way ANOVA of Follistatin diff	17									
one-way ANOVA of Follistatin pro	18									
one-way ANOVA of Myostatin diff	10									
one-way ANOVA of Myostatin pro	20									
New Analysis	20							_		
mily	> 21							_		
Myf5 diff	22									
one-way ANOVA	23									
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▼ Data Tables >>		Ordinary one-way ANOVA Multiple comparisons										
Myr 5 pro		blumber of femilies	4									
III MyoD pro		Number of families	1									
Myogenin diff	2	Number of comparisons per family	3									
E Follistatin diff	3	Alpha	0.05									-
E Follistatin pro	5	Tukey's multiple comparisons test	Mean Diff	95.00% CLof diff	Significant?	Summa	n/	Adjusted P	Value			
🖽 Myostatin diff	-	CRD up CRN	0.2011	0.6061 to 1.008	Ne	- Cummu	.,	0.0216	Turbe	A D		
Myostatin pro	7	CRO VIL ODA	0.4049	1.031 to 0.7730	Ne	113		0.0314		1.0		
New Data Table	-	CBD VS. MTH	-0.1243	-1.021 to 0.7729	NO	ns		0.9314		A-C		
♥ Info ≫	8	CBN vs. MTH	-0.3253	-1.222 to 0.5718	No	ns		0.6232		B-C		
(i) Project info 1	9											
New Info	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of di	iff.	n1		n2	q	DF
▼ Results >>	11	CBD vs. CBN	0.8757	0.6747	0.2011	0.3454		6		6	0.8232	15
one-way ANOVA of Myf5 diff	12	CBD vs. MTH	0.8757	1.000	-0.1243	0.3454		6		6	0.5089	15
E one-way ANOVA of Myr 5 pro	13	CBN vs. MTH	0.6747	1.000	-0.3253	0.3454		6		6	1.332	15
E one-way ANOVA of MyoD on	14											
one-way ANOVA of Muogenin diff	15											
a one-way ANOVA of Myogenin oro	16											
one-way ANOVA of Follistatin diff	17											
ane-way ANOVA of Follistatin pro	10											
= one-way ANOVA of Myostatin diff	18											
a one-way ANOVA of Myostatin pro	19											
New Analysis	20											
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E Follistatin diff		Ordinary one-way ANOVA											
E Follistatin pro		ANOVA results											
Myostatin diff													
Myostatin pro	1	Table Analyzed	MyoD diff										
New Data Table	2	Data sets analyzed	A-C										
r Info »	3												
Project info 1	- 4	ANOVA summary											
New Info	5	F	0.04981										
Results »	6	P value	0.9515										
E one-way ANOVA of Myf 5 pro	7	P value summary	ns										
E one-way ANOVA of MyoD diff	8	Significant diff, among means (P < 0.05)?	No										
one-way ANOVA of MyoD pro	9	R squared	0.004313										
a one-way ANOVA of Myogenin diff	10												 -
i one-way ANOVA of Myogenin pro	44	Provin Formithe test											
one-way ANOVA of Follistatin diff	40	5 (DE- DE4)								_		_	
one-way ANOVA of Follistatin pro	12	F (DFR, DFd)								_		_	
one-way ANOVA of Myostatin diff	13	P value										_	
one-way ANOVA of Myostatin pro	14	P value summary											
New Analysis	15	Are SDs significantly different (P < 0.05)?											
Graphs »	16												
Myf5 diff	17	Bartlett's test											
Myf 5 pro	18	Bartlett's statistic (corrected)	0.2069										
MyoD am	19	P value	0.9017										
N Myoo pro	20	P value summary	ns										
e e	21	Are SDs significantly different (P < 0.05)?	No										
amily >:	22												
MyoD diff	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value						
a one-way ANOVA	24	Treatment (between columns)	0.2396	2	0.1198	F (2, 23) = 0.04981	P=0.9515	5					
	25	Residual (within columns)	55.33	23	2 405	. (a, 20) - 0.04001	0.0010						
	26	Total	55.57	25	2		-			-			
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Data Tables pro		Ordinary one-way ANOVA Multiple comparisons								
Myostatin diff	1	Number of families	1							
New Data Table	2	Number of comparisons per family	3							
▼ Info »	3	Alpha	0.05							
(i) Project info 1	4	7 op m	0.00							
New Info	5	Tukey's multiple comparisons test	Mean Diff	95.00% CLof diff	Significant?	Summany	Adjusted P Value			
▼ Results >>	6	CBD ve CBN	-0.2027	-2.034 to 1.628	No	oe.	0.9586	A.B		
one-way ANOVA of Myf5 diff	7	CRD va. MTH	0.2009	2.004 to 1.020	Ne		0.0017	4.0		
one-way ANOVA of Myf 5 pro	-	CODU VS. MITH	-0.2006	-2.000 t0 1.007	No	ns	0.9017	R.C.		
E one-way ANOVA of MyoD diff	0	CBN VS. MTH	0.001000	-1.003 10 1.009	NO	ris	>0.9999	B-0		
one-way ANOVA of Myodenin diff	9									
one-way ANOVA of Myogenin drift	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1	nz	9	DF
one-way ANOVA of Follistatin diff	11	CBD vs. CBN	0.7992	1.002	-0.2027	0.7311	9	9	0.3920	23
a one-way ANOVA of Follistatin pro	12	CBD vs. MTH	0.7992	1.000	-0.2008	0.7536	9	8	0.3768	23
one-way ANOVA of Myostatin diff	13	CBN vs. MTH	1.002	1.000	0.001858	0.7536	9	8	0.003487	23
one-way ANOVA of Myostatin pro	14									
New Analysis	15									
▼ Graphs >>	16									
Myf5 diff	17									
Myr b pro	18									
MyoD oro	19									
Myogenin diff	20									
e Eamily	21									
MyoD diff	22									
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E Follistatin diff		ANOVA results											
Myostatin diff	1	Table Analyzed	MyoD pro										
New Data Table	2	Data sets analyzed	A-C										
Info »	3												
<ol> <li>Project info 1</li> </ol>	4	ANOVA summary											
New Info	5	F	0.2003										
Results >>	6	P value	0.8206										
= one-way ANOVA of Myf5 on	7	P value summary	ns										
one-way ANOVA of MyoD diff	8	Significant diff. among means (P < 0.05)?	No										
one-way ANOVA of MyoD pro	9	R squared	0.02601										
one-way ANOVA of Myogenin diff	10												
one-way ANOVA of Myogenin pro	11	Brown-Forsythe test											
one-way ANOVA of Follistatin diff	12	F (DFn, DFd)											
one-way ANOVA of Myostatin diff	13	P value											
= one-way ANOVA of Myostatin pro	14	P value summary											
New Analysis	15	Are SDs significantly different (P < 0.05)?											
Graphs »	16												
Myf5 diff	17	Bartlett's test											
Myf 5 pro	18	Bartlett's statistic (corrected)	7.186										
MyaD am	19	P value	0.0275										
Myogenin diff	20	P value summary	•										
e milu	21	Are SDs significantly different (P < 0.05)?	Yes										
MyoD pro	22												
one-way ANOVA	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value						
	24	Treatment (between columns)	0.7322	2	0.3661	F (2, 15) = 0.2003	P=0.8206						
	25	Residual (within columns)	27.42	15	1.828								
	26	Total	28.15	17									
	27												
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E Follistatin diff		Ordinary one-way ANOVA											
E Follistatin pro		ANOVATESUIS											
Myostatin diff	1	Table Apply red	Muogenin diff										
Myostatin pro		Table Analyzed	Myogenin all										
Info	2	Data sets analyzed	A-0										
Project info 1	3	41014											
New Info	4	ANOVA summary	0.000045										
▼ Results >>	5	P	0.002015										
i one-way ANOVA of Myf5 diff	6	P value	0.9980										
one-way ANOVA of Myf 5 pro	7	P value summary	ns										
one-way ANOVA of MyoD diff	8	Significant diff. among means (P < 0.05)?	No										
Image:	9	R squared	0.0001752										
one-way ANOVA of Myogenin diff	10												
one-way ANOVA of Kiljistatin diff	11	Brown-Forsythe test											
one-way ANOVA of Follistatin pro	12	F (DFn, DFd)											
= one-way ANOVA of Myostatin diff	13	P value											
one-way ANOVA of Myostatin pro	- 14	P value summary											
New Analysis	15	Are SDs significantly different (P < 0.05)?											
▼ Graphs >>	16												
Myf5 diff	17	Bartlett's test											
Myf 5 pro	18	Bartlett's statistic (corrected)	3.089										
MydD din	19	P value	0.2134										
Myogenin diff	20	P value summary	ns										
Constitution of the second sec	21	Are SDs significantly different (P < 0.05)?	No										
Family >>	22												
DODE-WAY ANOVA	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value						
	24	Treatment (between columns)	0.002402	2	0.001201	F (2, 23) = 0.002015	P=0.9980						
	25	Residual (within columns)	13.71	23	0.5962								
	26	Total	13.72	25									
	27												
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New Info	5	Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summa	irv	Adjusted	P Value			
▼ Results >>	6	CBD vs. CBN	-0.03983	-2.067 to 1.988	No	ns	.,	0.9986		A-B		
E one-way ANOVA of Myf5 diff	7	CBD vs. MTH	-0.4464	-2.474 to 1.581	No	ns		0.8369		A-C		
one-way ANOVA of MyoD diff	8	CBN vs. MTH	-0.4065	-2.434 to 1.621	No	ns		0.8624		B-C		
E one-way ANOVA of MyoD pro	9											
i one-way ANOVA of Myogenin diff	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of d	iff.	n1		n2	a	DF
one-way ANOVA of Myogenin pro	11	CBD vs. CBN	0.5536	0.5935	-0.03983	0.7805		6		6	0.07216	15
one-way ANOVA of Follistatin diff	12	CBD vs. MTH	0.5536	1.000	-0.4464	0.7805		6		6	0.8087	15
= one-way ANOVA of Follistatin pro	13	CBN vs. MTH	0.5935	1.000	-0.4065	0.7805		6		6	0.7366	15
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Results     >	6	CBD vs. CBN	-0.01200	-0.9236 to 0.8996	No	ns	0.9994	A-B		
= one-way ANOVA of Myf5 diff	7	CBD vs. MTH	-0.02380	-0.9634 to 0.9158	No	ns	0.9978	A-C		
= one-way ANOVA of MyoD diff	8	CBN vs. MTH	-0.01180	-0.9514 to 0.9278	No	ns	0.9995	B-C		
one-way ANOVA of MyoD pro	9									
one-way ANOVA of Myogenin diff	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1	n2	a	DF
one-way ANOVA of Myogenin pro	11	CBD vs. CBN	0.9762	0.9882	-0.01200	0.3640	9	9	0.04662	23
one-way ANOVA of Follistatin diff	12	CBD vs. MTH	0.9762	1.000	-0.02380	0.3752	9	8	0.08970	23
= one-way ANOVA of Follistatin pro	13	CBN vs. MTH	0.9882	1.000	-0.01180	0.3752	9	8	0.04448	23
one-way ANOVA of Myostatin oro	14									
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one-way ANOVA of Myf5 diff	6	P value	0.8493										
one-way ANOVA of Myf 5 pro	7	P value summary	ns										
one-way ANOVA of MyoD diff	8	Significant diff. among means (P < 0.05)?	No										
one-way ANOVA of MyoD pro	9	R squared	0.02155										
i one-way ANOVA of Myogenin diff	10												
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(+) New Analysis	15	Are SDs significantly different (P < 0.05)?											
♥ Graphs >>>	16												
Myts diff	17	Bartlett's test											
MunD diff	18	Bartlett's statistic (corrected)	3.405										
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0	21	Are SDs significantly different (P < 0.05)?	No										
Family »	22												
Myogenin pro	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value						
- one-way ANOVA	24	Treatment (between columns)	1 964	2	0.9819	F (2, 15) = 0 1851	P=0.8493						
	25	Residual (within columns)	89.18	15	5.946	. (a, 10) - 0.1001	0.0483						
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# Results >>	6	CBD vs. CBN	0.5751	-3.082 to 4.232	No	ns	0.9126	A-B		
= one-way ANOVA of Myf5 diff	7	CBD vs. MTH	0.7804	-2.876 to 4.437	No	ns	0.8458	A-C		
= one-way ANOVA of MyoD diff	8	CBN vs. MTH	0.2053	-3.451 to 3.862	No	ns	0.9884	B-C	_	
ane-way ANOVA of MyoD pro	9									
= one-way ANOVA of Myogenin diff	10	Test details	Mean 1	Mean 2	Mean Diff	SE of diff	n1	n2		DE
one-way ANOVA of Myogenin pro	11	CBD vs. CBN	1.780	1.205	0.5751	1.408	6	6	0.5777	15
one-way ANOVA of Follistatin diff	12	CBD vs. MTH	1 780	1,000	0 7804	1.408	6	6	0.7840	15
one-way ANOVA of Follistatin pro	13	CBN vs. MTH	1 205	1,000	0.2053	1.408	6	6	0.2062	15
one-way ANOVA of Myostatin diff	14	ODIT VA. MITT	1.200	1.000	0.2030	1.400	0	•	0.2002	10
one-way ANOVA of Myostatin pro	16									
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Results >>	5	F	0.1686										
e one-way ANOVA of Myf5 diff	6	P value	0.8459										
= one-way ANOVA of Myf 5 pro	7	P value summary	ns										
one-way ANOVA of MyoD diff	8	Significant diff. among means (P < 0.05)?	No										
one-way ANOVA of MyoD pro	9	R squared	0.01445										
one-way ANOVA of Myogenin diff	10												
one-way ANOVA of Myogenin pro	11	Brown-Forsythe test											
one-way ANOVA of Follistatin diff	12	F (DFn, DFd)											
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one-way ANOVA of Myostatin on	14	P value summary											
New Analysis	15	Are SDs significantly different (P < 0.05)?											
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Nvf5 diff	17	Partiatt's test						-		-			
Myf 5 pro	10	Partiett's statistic (corrected)	0.7206					-					
MyoD diff	18	Barbett's stabsoc (corrected)	0.7306					_					
MyoD pro	19	P value	0.6940					_		_			
Myogenin diff	20	P value summary	ns										
mily »	21	Are SDs significantly different (P < 0.05)?	No							_			
Follistatin diff	22												
one-way ANOVA	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value						
	24	Treatment (between columns)	0.3700	2	0.1850	F (2, 23) = 0.1686	P=0.8459						
	25	Residual (within columns)	25.24	23	1.097								
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	0.2604	-1 014 to 1 535	No		0.8665	A-C		
□ Ore-may AND/A of Myogin of Control         □         ■	0.01922	-1 255 to 1 294	No	05	0.9992	B-C		-
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Project info 1	4	ANOVA summary					-			-		-		
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one-way ANOVA of Myf5 diff	0	P value	0.0002							_		_		
one-way ANOVA of Myf 5 pro	/	P value summary	ns				-			_		_		
one-way ANOVA of MyoD diff	8	Significant diff. among means (P < 0.05)?	No									_		
= one-way ANOVA of MyoD pro	9	R squared	0.04860											
one-way ANOVA of Myogenin diff	10													
one-way ANOVA of Myogenin pro	- 11	Brown-Forsythe test												
E one-way ANOVA of Follistatio pro	12	F (DFn, DFd)												
one-way ANOVA of Muostatin diff	13	P value												
one-way ANOVA of Myostatin pro	14	P value summary												
New Analysis	15	Are SDs significantly different (P < 0.05)?												
▼ Graphs »	16													
Myf5 diff	17	Bartlett's test								-		-		
Myf 5 pro	18	Bartlatt's statistic (corrected)	5 755											
MyoD diff	10	Durbles	0.0562							-				
MyoD pro	19	P value	0.0303							_		_		
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Family >>	21	Are SDs significantly different (P < 0.05)?	No							_				
Follistatin pro	22													
one-way ANOVA	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value							
	24	Treatment (between columns)	0.1420	2	0.07100	F (2, 15) = 0.3831	P=0.688	2						
	25	Residual (within columns)	2.780	15	0.1853									
	26	Total	2.922	17										
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Myostatin diff Myostatin pro	1	Number of families	1							
New Data Table	2	Number of comparisons per family	3							
r Info »	3	Alpha	0.05							
Project info 1	4									+
New Info	5	Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value			
Results »	6	CBD vs. CBN	0.08891	-0.5567 to 0.7345	No	ns	0.9322	A-B		
one-way ANOVA of Myf5 diff	7	CBD vs. MTH	-0.1275	-0.7731 to 0.5181	No	05	0.8662	A-C		
I one-way ANOVA of Myr 5 pro one-way ANOVA of MyrD diff	8	CBN vs. MTH	-0.2164	-0.8620 to 0.4292	No	05	0.6662	B <sub>2</sub> C		+
a one-way ANOVA of MyoD on	9	00110.1111	-0.2101	0.002010 0.1202	110	110	0.0002	00		
one-way ANOVA of Myogenin diff	10	Tost details	Mean 1	Maan 2	Mean Diff	SE of diff	nt			DE
a one-way ANOVA of Myogenin pro	10	CRD vs. CRM	0.9725	0.7936	0.08901	0.2495	e	6	9	16
ne-way ANOVA of Follistatin diff	12	CBD vs. CBN	0.0725	1,000	0.1075	0.2465	e	6	0.3035	16
😑 one-way ANOVA of Follistatin pro	12	CBD VS. MTH	0.0720	1.000	-0.1275	0.2465	0	0	0.7200	10
one-way ANOVA of Myostatin diff	13	CBN VS. MTH	0.7836	1.000	-0.2164	0.2485	0	0	1.231	15
one-way ANOVA of Myostatin pro	14									
New Analysis	15									
Shorts diff	16									
Myro din	17									
Myn o pio	18									
MyoD pro	19									
Myogenin diff	20									
o amily	21									
Follistatin pro	22									
one-way ANOVA	23									
	24									
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	99	DIE O DE VIET ODE-WAY ANOVA of Ex	llistatin pro	Row 1.0	olumn A				Q	6

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Qr Search		ANOVA results × E Multiple comparise	ons ×   ~											
Data Tables i pro »		0.1												
E Follistatin diff		ANOVA results												
E Follistatin pro		Pero Villadita												
Myostatin diff		Table Assessed	11					_						
🔛 Myostatin pro	1	Table Analyzed	Myostatin diff					_		_				
New Data Table	2	Data sets analyzed	A-C											
Info »	3													
Project into 1	- 4	ANOVA summary												
+ New Info	5	F	0.3751											
Results »	6	P value	0.6914											
ana-way ANOVA of Myt5 dill	7	P value summary	ns											
= one-way ANOVA of MucD diff	8	Significant diff, among means (P < 0.05)?	No											
= one-way ANOVA of MyoD pro	0	Required	0.02158					-						
= one-way ANOVA of Myogenin diff	- 40	it aqualeu	0.03130					-						
one-way ANOVA of Myogenin pro	10							_						
= one-way ANOVA of Follistatin diff	11	Brown-Forsythe test						_						
ane-way ANOVA of Follistatin pro	12	F (DFn, DFd)												
😑 one-way ANOVA of Myostatin diff	13	P value												
one-way ANOVA of Myostatin pro	14	P value summary												
New Analysis	15	Are SDs significantly different (P < 0.05)?												
Graphs »	16													
Myf5 diff	17	Bartlett's test												
Myf 5 pro	18	Bartlett's statistic (corrected)	0.3716											
MyoD diff	19	P value	0.8304											
MyoD pro	20	P value summany												
Myogenin diff	20	Are CDs simplificable different (D < 0.05)2	hie .					-						
mily »	21	Are SDs significantly different (P < 0.05)?	NO					_		_				
Myostatin diff	22							_						
one-way ANOVA	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value							
	24	Treatment (between columns)	1.035	2	0.5176	F (2, 23) = 0.3751	P=0.6914							
	25	Residual (within columns)	31.74	23	1.380									
	26	Total	32.78	25										
	27													
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Follistatin diff		Ordinary one-way ANOVA ANOVA results											
Myostatin diff	1	Table Analyzed	Mvostatin pro										
Myostatin pro     New Data Table	2	Data sets analyzed	A.C.										
▼ Info »	3	bala oolo anayzoo											
Project info 1	4	ANOVA summary						1					
New Info	5	F	0.05629										
▼ Results >>	6	Pivalue	0.9455										
one-way ANOVA of Myf5 diff	7	P value summary	ns										
= one-way ANOVA of Myrb pro	8	Significant diff, among means (P < 0.05)?	No										
one-way ANOVA of MyoD pro	9	R squared	0.007450										
a one-way ANOVA of Myogenin diff	10												
i one-way ANOVA of Myogenin pro	11	Brown-Forsythe test											
one-way ANOVA of Follistatin diff	12	F (DEn, DEd)											
one-way ANOVA of Follistatin pro	13	P value											
one-way ANOVA of Myostatin diff     one-way ANOVA of Myostatin pro	14	P value summary											
New Analysis	15	Are SDs significantly different (P < 0.05)?											
▼ Graphs »	16												
Myf5 diff	17	Bartlett's test											
🖂 Myf 5 pro	18	Bartlett's statistic (corrected)	1.469										
MyoD diff	19	P value	0.4796										
Myou pro	20	P value summary	ns										
e e e e e e e e e e e e e e e e e e e	21	Are SDs significantly different (P < 0.05)?	No										
Family >>	22												
ope-way ANOVA	23	ANOVA table	SS	DF	MS	F (DFn, DFd)	P value						
	24	Treatment (between columns)	0.8556	2	0.4278	F (2, 15) = 0.05629	P=0.9455						
	25	Residual (within columns)	114.0	15	7.599								
	26	Total	114.8	17									
	27												
	-												
	88)	One-way A	NOVA of Myostat	in pro	e 🖉	Row 1, Column A						Ξ.	®

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Q+ Search		ANOVA results × 🔲 Multiple comparisons ×	~									
Data Tables pro      Second Statin diff     Follistatin pro     Follistatin pro		Ordinary one-way ANOVA Multiple comparisons										
Myostatin ditr	1	Number of families	1									
New Data Table	2	Number of comparisons per family	3									
♥ Info >>>	3	Alpha	0.05									
(i) Project info 1	4											_
New Info	5	Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summa	rv	Adjusted	P Value			
▼ Results >>>	6	CBD vs. CBN	0.4525	-0.9343 to 1.839	No	ns		0.6964		A-B		
= one-way ANOVA of Myf5 diff	7	CBD vs. MTH	0.3695	-1.060 to 1.799	No	ns		0.7957		A-C		
one-way ANOVA of MypD diff	8	CBN vs. MTH	-0.08304	-1.513 to 1.347	No	ns		0.9884		B-C		-
ane-way ANOVA of MyoD pro	9											
i one-way ANOVA of Myogenin diff	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of di	iff.	n1		n2	a	DF
i one-way ANOVA of Myogenin pro	11	CBD vs. CBN	1.370	0.9170	0.4525	0.5538		9		9	1.156	23
one-way ANOVA of Follistatin diff	12	CBD vs. MTH	1.370	1.000	0.3695	0.5708		9		8	0.9154	23
one-way ANOVA of Follistatin pro	13	CBN vs. MTH	0.9170	1.000	-0.08304	0.5708		9		8	0.2057	23
= one-way ANOVA of Myostatin dirf	14											
New Analysis	15											
▼ Graphs >>>	16											
🗠 Myf5 diff	17											
🗠 Myf 5 pro	18											
MyoD diff	19											
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	00	THE OPEN ANOVA of N	evostatin diff	Row 1.	Column A						Q	

Coarding      Control      Control     Contro     Control     Control     Control     Control     Control     Co	ADVA results ×      Multiple comparisons     Coffmary one-way ANOVA     Appla     Appla     Coffmary one-way ANOVA     Coffmary one-way	× v v 1 1 3 0.05 Mean Diff. 0.3546 0.5231 Mean 1 1.355	95.00%, Ci of diff. 4.303 to 3.965 4.379 to 4.489 3.811 to 4.657 Mean 2 1523	Significant? No No Mean Diff.	Summary ns ns sE of diff.	Adjusted P Value 0.9938 0.9731 0.9424 n1	A-B A-C B-C n2	9	DF
Data Tables         >>           Tollisation drif         >>           Tollisation pro         >>           Mystatin pro         >>           Mystatin pro         >>           O'New Data Table         >>           Montania         >>           O'New Data Table         >>           O'New Data Table         >>           O'new ration ANXA of MyS diff         >>           O'new ration ANXA of MyS diff         >>           O'new ration ANXA of MyS diff         >>           O'new ration ANXA of MyS diff or O'new ration ANXA of MyS diff or O'new ration ANXA of MyS diff or O'new ration ANXA of MyS diff diff or O'new ration ANXA of MyS diff diff or O'new ration ANXA of MyS diff diff diff or O'new ration ANXA of MyS diff diff diff diff diff diff diff dif	Ordinary one-way ANOVA Multiple comparisons           Number of families           Number of comparisons per family           Alpha           Tukey's multiple comparisons test           CBD vs. CBN           CBD vs. NFH           CBD vs. NFH           D           Test details           CBD vs. RMTH	1 3 0.05 Mean Diff. -0.1685 0.3546 0.5231 Mean 1 1.355	95.00% Ci of diff. 4.303 to 3.965 -3.779 to 4.469 -3.611 to 4.657 Mean 2 1.523	Significant? No No Mean Diff.	Summary ns ns SE of diff.	Adjusted P Value 0.9938 0.9731 0.9424 n1	A-B A-C B-C n2	9	DF
Myostatin off           Myostatin off           Mostatin off           Mostatin off           One of the Table           Info           Or Reise (Info 1           Or New Info           One over NANOXA of Myf5 diff           One-way ANOXA of Myf0 diff	Number of families           Number of comparisons per family           Appa           Appa           Tubery smultiple comparisons test           CBD vs. CBN           CBD vs. MTH           CBD vs. CBN           CBD vs. CBN           CBD vs. MTH           CBD vs. CBN	1 3 0.05 Mean Diff. -0.1685 0.3546 0.3546 0.3546 0.3546 0.355	95.00% Cl of diff. 4.303 to 3.965 -3.779 to 4.489 -3.611 to 4.657 Mean 2 1.523	Significant? No No No Mean Diff.	Summary ns ns SE of diff.	Adjusted P Value 0.9938 0.9731 0.9424 n1	A-B A-C B-C n2	9	DF
Myostati pro         2           New Data Table         2           Info         2           Project Info         2           One-way ANDXA of Myf Saft         2	Number of tamiles           Number of anniles           Appa           Tukay's multiple comparisons test           CBD vs. CBN           CBD vs. NTH           CBD vs. NTH           CBD vs. CBN           CBD vs. NTH           CBD vs. CBN           CBD vs. NTH           CBD vs. NTH           CBD vs. NTH	1 3 0.05 Mean Diff. -0.1685 0.3546 0.5231 Mean 1 1.355	95.00% C1 of diff. 4.303 to 3.965 -3.779 to 4.489 -3.611 to 4.657 Mean 2 1.523	Significant? No No No Mean Diff.	Summary ns ns SE of diff.	Adjusted P Value 0.9938 0.9731 0.9424 n1	A-B A-C B-C n2	9	DF
Owner Data Table	2 Number of comparisons per family     3 Apha     4     5     104597 smultiple comparisons test     6 CBD vs. CBN     CBD vs. CBN     CBD vs. MTH     7     10 Test details     10 CBD vs. CBN     20 CBD vs. MTH	3 0.05 Mean Diff. -0.1685 0.3546 0.5231 Mean 1 1.355	95.00% Cl of diff. 4.303 to 3.965 -3.779 to 4.489 -3.611 to 4.657 Mean 2 1.523	Significant? No No No Mean Diff.	Summary ns ns ns SE of diff.	Adjusted P Value 0.9938 0.9731 0.9424 n1	A-B A-C B-C n2	9	DF
min         project Info 1         project Info 1           © New Info         project Info 1           © new Info 1         project Info 1	Alpha           Subsystem           CBD vs. SBN           CBD vs. SBN           CBD vs. SMTH           CBD vs. SMTH           Test details           10         Test details           10         CBD vs. SMTH           200 vs. SMTH	0.05 Mean Diff. -0.1685 0.3546 0.5231 Mean 1 1.355	95.00% Cl of diff. 4.303 to 3.965 -3.779 to 4.489 -3.611 to 4.657 Mean 2 1.523	Significant? No No No Mean Diff.	Summary ns ns ns SE of diff.	Adjusted P Value 0.9938 0.9731 0.9424 n1	A-B A-C B-C n2	9	DF
Virget and a	4         5         Takey's multiple comparisons test           6         CBD vs. CBN         7           7         CBD vs. NTH         7           8         CBN vs. MTH         7           9         Test details         7           10         Test details         7           12         CBD vs. CBN         7	Mean Diff. -0.1685 0.3546 0.5231 Mean 1 1.355	95.00% CI of diff. -4.303 to 3.965 -3.779 to 4.489 -3.611 to 4.657 Mean 2 1.523	Significant? No No No Mean Diff.	Summary ns ns ns SE of diff.	Adjusted P Value 0.9938 0.9731 0.9424 n1	A-B A-C B-C n2	q	DF
Results 2014 Cone-way ANOVA of Myf5 diff cone-way ANOVA of Myf5 diff cone-way ANOVA of Myf5 diff cone-way ANOVA of Myc0 pro cone-way ANOVA of Myc0 pro cone-way ANOVA of Myc0 pro cone-way ANOVA of Myc0 prime cone-way ANOVA of Myc0 prime cone-way ANOVA of Pollistatin diff cone-way ANOVA of Pollistatin pro cone-way ANOVA of Pollistatin pro	Tukey multiple comparisons test           CRD vs. GMV           CRD vs. MTH           CRD vs. MTH           Test details           CRD vs. CRN           CRD vs. CRN	Mean Diff. -0.1685 0.3546 0.5231 Mean 1 1.355	95.00% Cl of diff. -4.303 to 3.965 -3.779 to 4.489 -3.611 to 4.657 Mean 2 1.523	Significant? No No No Mean Diff.	Summary ns ns ns SE of diff.	Adjusted P Value 0.9938 0.9731 0.9424 n1	A-B A-C B-C n2	q	DF
	6         CED vs. CRN           7         CED vs. MTH           8         CRN vs. MTH           9         Test details           11         CED vs. CRN           12         CED vs. CRN           12         CED vs. CRN	-0.1685 0.3546 0.5231 Mean 1 1.355	-4.303 to 3.965 -3.779 to 4.489 -3.611 to 4.657 Mean 2 1.523	No No No Mean Diff.	ns ns ns SE of diff.	0.9938 0.9731 0.9424 n1	A-B A-C B-C n2	q	DF
one-way ANOVA of Myrb 5 pro           one-way ANOVA of Myrb 0 pro           one-way ANOVA of Myrb pro           one-way ANOVA of Pollistatin pro           one-way ANOVA of Myrb pro	7         CBD vs. MTH           8         CBN vs. MTH           9         The details           10         Test details           11         CBD vs. CBN           2         CBD vs. MTH	0.3546 0.5231 Mean 1 1.355	-3.779 to 4.489 -3.611 to 4.657 Mean 2 1.523	No No Mean Diff.	ns ns SE of diff.	0.9731 0.9424 n1	A-C B-C n2	q	DF
one-way ANOVA of MyoD diff     one-way ANOVA of MyoD pro     one-way ANOVA of Myogenin diff     one-way ANOVA of Myogenin pro     one-way ANOVA of Myogenin pro     one-way ANOVA of Follistatin diff     one-way ANOVA of Follistatin diff	8         CBN vs. MTH           9	0.5231 Mean 1 1.355	-3.611 to 4.657 Mean 2 1.523	No Mean Diff.	ns SE of diff.	0.9424 n1	B-C n2	q	DF
	9 10 Test details 11 CED vs. CBN 12 CBD vs. MTH	Mean 1 1.355	Mean 2 1.523	Mean Diff.	SE of diff.	n1	n2	q	DF
one-way ANOVA of Myogenin diff     one-way ANOVA of Myogenin pro     one-way ANOVA of Myogenin pro     one-way ANOVA of Follistatin diff     one-way ANOVA of Follistatin pro     one-way ANOVA of Myostatin diff	Test details           11         CBD vs. CBN           12         CBD vs. MTH	Mean 1 1.355	Mean 2 1.523	Mean Diff.	SE of diff.	n1	n2	q	DF
one-way ANOVA of Myogenin pro     one-way ANOVA of Follistatin diff     one-way ANOVA of Follistatin pro     one-way ANOVA of Follistatin pro     one-way ANOVA of Myostatin diff	11         CBD vs. CBN           12         CBD vs. MTH	1.355	1.523	0.1695					
one-way ANOVA of Follistatin diff     one-way ANOVA of Follistatin pro     one-way ANOVA of Myostatin diff	12 CBD vs. MTH			°U. 1003	1.592	6	6	0.1497	15
one-way ANOVA of Pollistatin pro     one-way ANOVA of Myostatin diff		1.355	1.000	0.3546	1.592	6	6	0.3151	15
i = one-way AndovA or Myostatin uni	13 CBN vs. MTH	1.523	1.000	0.5231	1.592	6	6	0.4648	15
E ope-way ANOVA of Myostatia pro	14								
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Quantification of Myotube Surface Area (5uM)



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Pic 4	CBD_4.1	_pic 602	117.4 5	25.4275	415	1288	7.615+08	28.53951	1454141	155847.8	552.7782	454	1298	2.075-08	28.15541	1.655602	0.35875	μn	FILE											
Pic S	C80_4.3	pic 602	117.4 5	32.1745	421	1504	7.72+08	32.11464	1,740659	133679.8	562.9339	463	1504	1.810-08	37.62896	1.9182	0.221971	um .	FITC											
Pic 7	CRD_4.1	602 مار	117.4 5	61.0136	440	2926	8.125+08	48.93747	1.82563	191457.6	599.184	463	2926	2.766-08	65.16227	4.488327	0.817921	μm	FITC											
Pic B	CB0_4.1	pic 602	117.4 5	55.2187	436	1471	8.055+08	31.83277	1.565762	179035.4	582.3374	473	1471	2.510+08	33.26635	2.013807	0.297294	um.	FITC											
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Pic6	CRD_4.	jeic 602	117.4 5	82.8709	404	1291	7.718+08	28.10402	1.46087	341111.8	560 D891	464	1295	1.96+08	27.67083	1.425358	0.23433	μm	FIEC											
Pic 7	CBD_4.2	pic 602	117.4 5	24.2514	408	1230	7.556+08	28.11267	1.472406	139306.3	552.3748	455	1230	1.850-08	29.0021	1.661123	0.231455	μn	FITC											
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Pic 1	CBD_5.	pic 602	117.4 5	22.7027	413	1373	7.575+08	29.73468	1.613839	157567.9	548.7959	451	1038	2.085-08	28.54125	1.626305	0.261646	μn	FITC											
Pic 3	CB0_5.2	pic 602	117.4 5	00.9806	390	1813	7.258+08	26.40482	1.483796	154581.1	523.5784	434	1813	1.950-08	27.54127	1.521834	0.256687	pm .	FIEC											
Pic 4	CR0_5.2	602 اس	127.4 5	23.0964	411	1690	7.57€+08	29.52631	1.510022	145085.8	551.3592	445	1630	1.940-08	31.1262	1.931393	0.24258	ym.	FITC											
Pic 6	CR0 5.	pic 602	117.4 5	45.4287	430	1541	7.95+08	33,48384	1.621277	159504.3	577.4136	459	1541	2.215-08	35.15151	1.728956	0.264862	um.	FITC											
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Pic 2	CB0_5.2	pic 602	117.4 5	85.7368	459	1576	8.45E+08	40.16443	1.687375	224872.7	638.9481	499	1576	3.350+08	37.8966	1.68097	0.373438	μm	FIDC											
Pic S	C80_5.	jik 602	117.4 5	73.9709	445	1507	8.31E+08	39.39075	1.6893	160123.7	615 2603	501	1507	2.376-08	41.05401	2.086629	0.26585	pm.	RITC											
Pic 7	CBD_5.	pic 602	117.4 5	61.9393	438	1296	8.145+08	38.94075	1.72327	177410.5	597.6301	485	1296	2.556+08	29.32994	1.715953	0.294593	μm	FITC											
CBD 6.1																														
Pic 2	CRD_6.	602 عنو	117.4 4	97.6896	385	1309	7.25+08	33.03207	1.702128	236420.5	522.5525	427	1309	2.976-08	32.23642	1.827051	0.392583	μn	RITC											
Pic 3	CB0_6.3	pic 602	117.4 5	12.3445	298	968	7.425+08	34.12728	1.586605	226830.3	541.1714	427	968	2.950=08	30.51063	1.616702	0.376655	µm.	FITC											
4.5	CRD 6.1	pie 602	17.4 5	03.7256	390	1253	7.296+08	33.81747	1.692488	203013.8	532.5474	429	1253	2.68+08	33.51258	1.745098	0.33711	um.	RITC											
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Quantification of Myotube Diameter (5uM)



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5 short-axis measu All'myctubes in im	weenents taken along length of m tage that are identified through th	yatube end aver weuholding	ogea'	25.31473 2	N MTH 25.82905 23.92745		Plate 5 Plate 6	28.36326 29.51153	25.45603	22.61022 24.24947														
			st dev sem	3.365582 1	0.796353 0.472833		Plate 7	25.39625	26.97379	24.8427														
CBD 4.1	AVG Diameter																							
Pic 4	20.798				35,348	36 74	20.0	42.55	25.64	17.57	11.04	14,06	20.01	28.55 14.53	12.54	17,37	34.14	31,34	29.138	24.5	25.75	25.13	29.36	30.148
Pic S	24.27923				25.688	22.08	10.0	20.23	18.44	26.314	17.16	24.00	22.5	10.87	6.18	12.09	15.06	12.15	36.352	10.00	10.66	11.62		18.27
Pic 7	23.41176				23.27					11.12		14.00	35.5	15.62	6.18	13.97	15.99	13.55	24.94					24.648
Pic 8	18.38583				27.842	21.80			20.55	6.892	13.82	10.81	11.57	35,858	14.15	15.13	34.06	1.54	25.09	2.4	25.15	11.59	200	14 308
	21.71871				17.89	18.36	25.3	38.33	39.28	8.76	10.29	6.84	4.04	4.53 9.5	12.75	20.55	22.34	16.65	28.19	25.45	25.59	25.67	20.55	28.45
CBD 6.2	AVG Diameter																							
Pic 1	22.71371				28.176	21.56	19.2	21.92	46.14	32.232	14.15	24.26	42.45	32.016	11.97	14.06	11.69		23.448	17.61	54.02	14.24	11.15	38.618
PicS	22.06529				33.994	10.03	0.0	13.63	11.14	21.02	30.61	10.10	12.44	38.708	10.04	11.11	(1.4)	60.13	17.072	10.00	30.31	11.67	11.03	21 548
Pic G	22.0075				18.236					18.71			11.40	20.648	20.00		4.74	0.51	18.958				1000	15.274
Pic 7	22.24156				23.09	24.03	34.4	34.86	6.94	25.44	30.03	13.98	29.55	34.51 16.37	26.53	12.95	20.83	20.86	21.07	18.71	29.58	19.72	15.80	33.845
	22.25392				37.03	30.23	13.1	13.3	21.74	25.2	13.94	15.45	42.08	24.54 22.95	15.13		17.19	13.16	9.13	13.92	20.58	36.55	25.17	36.05
CBD 5.1	AVG Diameter																							
Pic 1	91.922				21.742	25.18	25.4	18.82	30.62	36.272	25.5	14.98	31.23	21,744	16.68	18.81	23.52	25.03	41.645	33.96	63.34	49.62	29.67	26.76
Pic 3	27.76178				24.178			20.11		17.754		10.00	17.30	17.858	17.66				28.974	20.1				67.002
Pic 4	23.90957				38.418					32.685				26.236	27.748				23.574					\$2.126
Pic G	32.62467				21.312	14.00	20.4	34.13		23.798	39.66	10.6	20.73	29.726	2.00	<u>M.U</u>		2.44	34.302	21.54	23.48	11.5	15.00	28.7
	28.9065				25.02	27.13	25.6	25.24	18.9	26.31	19.36	17.78	22.48	88.11 23.92	23.6	16.23	29.24	15.64	18.63	21.45	28.19	43.24	62	20.12
CBD 5.2	AVG Diameter																							
Pic 1	27,93271				55,202	28.87	36.9	68.12	117.95	15.474	10.23	9.67	25.84	23.994	29.11	26.72	23.13	22.24	11.846	14.03	11.71	2.54	10.87	22.28
Pic 2	81.04925				30.172	44.10	34.9	18.29	15.54	14.522	20.17	12.99	18.55	88.964 15.08 69.4	91.74	100.29	103.85	79.54	54.606	42.78	35.94	65.42	89.14	40.304
Pic S	24,49553				26.33	92				30.046				37.172	10.00	100.09			26,762				10.07	20.05
Pic 7	27.8306				41.842		21.0			26.572	26.71	- 10.1	39.11	26.55	28.09	17.06	74.15		33.934	26.2	~~~	16.00		81.126
	27,82282				36.21	34.18	54.4	40.15	44.21	37.52	24.76	17.72	32.83	81.23 36.11	30.62	34.95	28.62	22.45	27.35	19.93	25.3	45.41	50.64	26.34
CBD 6.1	AVG Diameter																							
Pic 2	31.64693				29,734	27.44	41.0	36.13	24.55	23.178	24.16	23.91	24.72	18.18 21.02	22.26	25.24	34.66	9.78	37.498	41.22	37.44	31.67	26.88	25.208
Pic 3	\$3.87267				42.368	13.26	30.	54.72	5.63	30.392	22.6	27.33	12.86	28.65	27.51	33.1	MIS	26.72	22.242	10.29	20.6	22.45	15.14	44 006
Pic S	26.804				22.754					42.046			41.00	26.35	20.04	22.1			22.642		20.0			23.608
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## Quantification of Myonuclei (5uM)




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5	204	546	37.36264		Hate d	CBD 27 4744	CBN 25.6000M	MTH 24 31508																
7	231	718	32.1727	10.1010	Plate 5	25.6486	27.31787	21.04965																
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Quantification of Myotube Surface Area (1uM)

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## Quantification of Myotube Diameter

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	23.3581162			26.44 64.0	0 25.60	31.36 23.0	1 24.5 30.302	18.19 20.77	17.37	20-5 23-54	12.53 30.45 32	64 27.30 %	40 53.58 M	23.45 34.54	53.22			45.132			21.196	-	-
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## **Quantification of Myonuclear Index**

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**ONE-WAY ANOVA Myotube Formation Analysis on PRISM (5uM)** 

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Mynuclear index	9	R squared	0.2952										
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r Graphs »	CBD VS. CBN	-1.034 -3.11	10 10 3.008	115	0.7558	A-D			
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3.A3	Sample 1	Target 1	UNIONOWIN	SYBR	None	Anp	27.2504594	26.3024186	0.99004426	1.04721934	FAISE	23336.904	1846	3	21	67.2987675	82.4734802	80.6200861		FAISE									
2 A2	Sample 1	Target 1	UNIONOWIN	SYDR	None	Amp	26.0850533	26.3024186	0.97294549	1.04721934	FALSE	23336.904	1800	3	28	67.0670853	80.6200867			FALSE									
4.44	Sample 1	Target 1 Target 1	UNICACIÓN	SYBE	None	Anp	25.59915377	26.8324186	0.96697926	1.06721934	FAUM	23336.904	1826		20	80.7259160	67.2670853			FAIM									
5 A5	Sample 1	Target 1	UNINOWN	SYDR	None	Amp	25.9964958	26.3024186	0.98009298	1.04721934	FALSE	23336.904	TRUE	3	29	80.6370697	67.3045297			FALSE									
6.46	Sample 1	Target 1	UNIONOWIN	SYBR	None	Anp	25.7242061	26.3024186	0.9757283	1.04721934	FAISE	22226.904	1826	3	29	67.3045197	82.4920349			FALSE									
7.47	Sample 1	Target 1	UNIONOWN	SYBR	None	Anp	25.1483864	26.3024186	0.98348388	1.04721934	FAISE	23336.904	18,4	3	26	80.6370697	67.3045297			FAISE									
2 42	Sample 1	Target 1	UNINGWN	SYBR	None	Anp	25.94423.95	26.3024286	0.97987218	1.04721934	FALSE	23336.904	1845	3	29	66.8479996	80.8098907	82.1667023	-	FALSE									
10,A30	Sample 1	Target 1	UNIONOWN	SYBR	None	Anp	26.1538529	26.3024186	0.9820255	1.04721934	FAISE	23336.904	1946	3	20	66.9640503	80.5419922			FAISE									
11 A11	Sample 1	Target 1	UNIONOWIN	SYDR	None	Amp	30.5434612	26.3024186	0.99356758	1.04721934	FALSE	23336.904	TRUE	3	23	86.1124344				FALSE									
12 A12	Sample 1	Target 1	UNIONOWIN	SYBR	None	Anp	26.2990481	26.3024186	0.98328375	1.04721934	FAISE	22226.904	1826	3	20	82.5148631	67.4282532			FAISE									
14 A14	Sample 1	Tanget 1	UNIONOWN	SYDR	None	Ano	25.6181276	26.3024186	0.98783555	1.04721934	FALSE	23336.904	TRUE	2	28	67.5155182	67.59991			FAISE									
15 A15	Sample 1	Target 1	UNIONOWN	SYBR	None	Anp	25.7642182	26.3024186	0.96584328	1.04721934	FAISE	22226.904	1846	3	29	80.5792236	67.39991			FAISE									
16 A35	Sample 1	Target 1	UNINGWN	SYBR	None	Anp	25.5149971	26.3024186	0.97998694	1.04721934	FAISE	23336.904	1846	3	17	80.6948338	67.39991			FAISE									
17 A17	Sample 1	Tanget 1	UNKNOWN	SYBR	None	Amp	29.2989245	25.3024186	0.9/48964	1.04721934	FALSE	22226.904	1806	3	29	67.0155463	83.8639374	80.5389633		FAISE									
19 A 29	Sample 1	Target 1	UNINGWIN	SYBR	None	No Arrep	Undetermine	d	0		FAISE	23336.904	1846	3	39	78.9052734	75.4259415	91.4308701	85.74796	a FAISE									
20 A 20	Sample 1	Target 1	UNINOWN	SYDR	None	No Amp	Undetermine	d	0		FALSE	23336.904	TRUE	3	29	81.1088486	77.6295366	73.6862793	92.010753	4 FAISE									
21 A21	Sample 1	Target 1	UNIONOWN	SYBR	None	No Amp	Undetermine	d	0		FAISE	222286.904	1815	3	39	65.2236949	91.6737061	82.9723893	85.568983	6 FAISE									
22 A22 23 A23	Sample 1 Sample 1	Tanget 1	UNKNOWN	SYDR	None	Amp	25.7654054	26.3024186	0.98011294	1.04721934	FALSE	23336.904	18/6	3	39	67.4260254	80.6520385	82,508310	78.333680	FALSE									
24 A24	Sample 1	Target 1	UNIONOWN	SYBR	None	Anp	25.4161236	26.3024186	0.96959459	1.04721934	FAISE	23336.904	1846	3	17	67.3100128	82.508316			FAISE									
25 81	Sample 1	Target 1	UNKNOWN	SYBR	None	Amp	25.2405897	26.3024186	0.97688337	1.04721934	FAISE	23336.904	TRUE	3	38	80.6200867	67.2987571			FAISE									
26 82	Sample 1	Target 1	UNIONOWN	SYBR	None	Amp	25.7211035	25.3024186	0.96980609	1.04721934	FAISE	23336.904 22236.904	TRUE	3	20	80.6200867	67.2987571	36 21825.42		FAISE									
28 84	Sample 1	Target 1	UNINGWN	SYBR	None	Ano	23.6968061	26.3024186	0.98953735	1.04721934	FAISE	23336.904	18,5	3	25	67.5829224	76.5657654			FAISE									
29 85	Sample 1	Target 1	UNKNOWN	SYBR	None	Amp	25.813684	26.3024186	0.9907413	1.04721934	FALSE	23336.904	1846	3	17	80.6370697	67.1885834	76.2315293		FALSE									
30.86	Sample 1	Target 1	UNIONOWN	SYBR	None	Anp	26.5034651	26.3024186	0.98599534	1.04721934	FAISE	23336.904	1806	3	21	80.6370697	67.8045297			FAISE									
33 87	Sample 1	Target 1	UNINGWN	SYDR	None	Amp	25.4960099 36.1634637	25.3024186	0.98/28981	1.04721934	EAISE	23336.904	1976	3	21	01.0370697	67.1885834			FAISE									
33.89	Sample 1	Target 1	UNIONOWN	SYBR	None	Anp	25.7456865	26.3024186	0.98078446	1.04721934	FAISE	23336.904	18,4	3	18	67.4282532	80.6580429			FAISE									
34 810	Sample 1	Target 1	UNINOWN	SYBR	None	Amp	25.5883257	26.3024186	0.98260781	1.04721934	FALSE	23336.904	1846	3	17	82.0506592	66.9640503			FAISE									
35 811	Sample 1	Target 1	UNKNOWN	SYBR	None	Amp	25.9729931	26.3024186	0.98695189	1.04721934	FALSE	22226.904	1826	3	17	82.1667023	67.5443039			FALSE									
37 812	Sample 1	Target 1	UNINGWN	SYDE	None	Arm	25 5236333	26.3024186	0.97536134	1.04721934	FAISE	23336.904	1928	1	17	82.2677606	67 2543018			FAISE									
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1 41	Savgle 1	Target 1	UNKNOWN	5786	Nove	Ave	28.915445	20,898694	0.9887034	3.4805535	TRUE	36894.237	190.0		1 1	7 81.63668				FALSE										
3 A3	Sample 1	Target 1	UNKNOWN	5198	None	Ang	23.57484	20.856654	0.9866486	3.4825531	TRUE	36894.237	TRUE		3 1	7 81.86563	2			FALSE										
4 A4	Sample 1	Target 1	UNKNOWN	5788	None	Δπρ	23.382564	20.898694	0.9808831	3.4825531	TRUE	36894.237	TRUE		3 1	81.75116	7			FAISE										
5 A5	Sample 1	Target 1	UNKNOWN	SYBR	None	Amp	23.922118	20.898654	0.9896805	2.4825531	TRUE	36894.237	TRUE		3 1	7 #1.64524 3 #1.8763#	1			FALSE										
7 A7	Sample 1	Target 1	UNKNOWN	5186	None	Ano	24.275838	20.898694	0.9842193	3.4825531	TRUE	36894.237	TRUE		3 3	\$ 81.64524	1			FALSE										
8 A8	Sample 1	Target 1	UNKNOWN	SYBR	None	Amp	24.229139	20.898654	0.9843429	2.4825531	TRUE	36894.237	TRUE		3 1	81.75976	6			FALSE										
9 A9	Sample 1	Target 1	UNKNOWN	5198	None	Amp	23.686829	20.898654	0.9876426	3.4825531	TRUE	36894.237	TRUE		3 3	5 81.66040 81.000533	5			FAISE										
11 A11	Sample 1	Target 1	UNKNOWN	5788	None	Ang	23.643746	20.898654	0.990681	3.4825531	TRUE	36894.237	18.6		1 1	5 80.97280	1			FALSE										
12 A12	Sample 1	Target 1	UNKNOWN	SHOR	None	Атр	23.751584	20.898654	0.9900413	3.4825531	TRUE	36894.237	TRUE		3 3	5 81.77500	3			FALSE										
13 A13	Sample 1	Target 1	UNKNOWN	5786	Nove	Ang	23.942944	20.858654	0.9845435	3.4825535	TRUE	36894.237	19.8		3 3	8 81.83229	3			PALSE										
15 A15	Sample 1	Target 1	UNKNOWN	SHER	None	Ang	23.638653	20.898654	0.9836256	3.4825531	TRUE	36894.237	TRUE		3 1	7 81.37508	4			FALSE										
35 A16	Sample 1	Target 1	UNKNOWN	5188	None	Amp	23.559429	20.858654	0.9840508	3.4825531	TRUE	36894.237	TRUE		3 3	8 81.71798	7			FAISE										
17 A17	Sample 1	Target 1	UNKNOWN	SYBR	None	Amp	23.809539	20.898654	0.9889683	3.4825531	TRUE	36894.237	TRUE		3 3	5 81.76364				FALSE										
29 A19	Sample 1	Target 1	UNKNOWN	5188	None	NyAng	Undetermine	d	0	1.441.000	TRUE	36894.237	TRUE		3 3	67.90415	2 72.8712	2 63.78066	\$ 85.4289	7 FAISE										
20 A20	Sample 1	Target 1	UNKNOWN	SYBR	None	No Amp	Undetermine	d	0		TRUE	36894.237	TRUE		3 3	81.99278	92.6450	13 86.00067	8 26.95291	1 FALSE										
21 A21 22 A2*	Sample 1	Target 1	UNKNOWN	STRE	None	No Amp No Amp	Undetermine	e d	0		TRUE	36894.237	TRUE		3 3	71.80220 68.M/200	90.9363	67.67755	a 81.54117	FALSE										
28 A28	Sample 1	Target 1	UNKNOWN	SYBR	None	Ang	23.653659	20.898654	0.9853498	3.4825531	TRUE	36894.237	TRUE		3 1	81.42660	5			FALSE										
24 A24	Sample 1	Target 1	UNKNOWN	SHIR	None	Атр	23.362992	20.898654	0.9838729	3.4825531	TRUE	36894.237	TRUE		3 1	81.54117	5			FALSE										
25 81	Sample 1	Target 1	UNKNOWN	5785	None	Amp	23.756236	20.858654	0.9874854	3.4825533	TRUE	36894.237	TRUE		3 1	81.52221				FAISE										
27 03	Sample 1	Target 1	UNKNOWN	SYBR	None	Amp	24.211927	20.898654	0.9882389	3.4825531	TRUE	36894.237	TRUE		3 1	81.52221	2			FALSE										
28.84	Sample 1	Target 1	UNKNOWN	5188	None	Amp	24.265437	20.858654	0.9874653	3.4825531	TRUE	36894.237	TRUE		3 3	\$ 81.40774	5			FAISE										
29.85	Sample 1 Sample 1	Target 1 Target 1	UNKNOWN	5786	None	Amp	25.288289 24.9655559	20.898654	0.9936865	3.4825531	TRUE	36894.237	TRUE		3 1	8 81.87428 7 81.43419				FALSE										
31 87	Sample 1	Target 1	UNKNOWN	5198	None	Amp	25.200112	20.898694	0.9858845	3.4825531	TRUE	36894.237	TRUE		3 1	81.87428	3			FAISE										
32 88	Savgle 1	Target 1	UNKNOWN	SYBR	None	Amp	25.29785	20.898694	0.9863663	8.4825531	TRUE	36894.237	TRUE		8 3	81.87428	8			FALSE										
AJ 107 34 800	Sample 1	-arget 1 Target 1	UNINOWN	5186	None	Amp	24.022415	20,855054	0.995021	1.4825533	TRUE	30894.237 36894.237	TRUE		3 1	81.66040 7 81.31660				FAISE										
85 811	Savgle 1	Target 1	UNKNOWN	SYBR	None	Amp	23.92629	20.898694	0.9936405	8.4825531	TRUE	36894.237	TRUE		8 3	\$ 82.00421	3			FALSE										
36 812	Sample 1	Target 1	UNKNOWN	SYBR	None	Amp	24.001375	20.898654	0.9883175	3.4825531	TRUE	36894.237	TRUE		3 1	7 82.1188	2			FALSE										
38 854	Sample 1 Sample 1	-arget 1 Target 1	UNKNOWN	5788	None	Amp	24.349487	20.898694	0.9873084	3.46/3533	TRUE	36894,237	190.0		3 1	81.71798	2			FALSE										
29 815	Sample 1	Target 1	UNKNOWN	SYBR	None	Amp	24.429751	20.898654	0.9907037	3.4825531	TRUE	36894.237	TRUE		3 1	81.83229	1			FALSE										
40 805	Sample 1	Target 1	UNKNOWN	5198	None	Amp	24.483031	20.858654	0.9868395	3.4825531	TRUE	36894.237	TRUE		3 1	5 81.71798	7			FAISE										
42 938	Sample 1	Tanget 1	UNKNOWN	SYBR	None	Ang	24.659639	20,898654	0.9877134	2.4825531	TRUS	36894.217	18,8		· · ·	5 81.87818				FALSE										
43 829	Sample 1	Target 1	UNKNOWN	5198	None	Атр	24.725012	20.898654	0.9883237	3.4825531	TRUE	36894.237	TRUE		3 3	8 81.87818	3			FALSE										
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0581 7484 23.4787	10.83003 10.84188 10.84840	4.190215	0.339235	1.265086	-	0.941701	1.155518	1.007628										
8216	19.35514	4 845 786	0.045333	0.040141		0.978495	0.682861	1.011657										
0425	19.43346					1.173878	1.028214	1.00852										
1914	19.49223		0.017637			0.742284	0.769231	1.001069										
1923	19.43127 19.9929	4.420117	40.167774	1.123324	AVS	0.918539	0.949742	1.007126										
1375 23.69765	16.77309 18.47327 20.17344	5.224397	0.636506	0.643269	ST DEV	0.153473 0.062655	0.290094	0.005328										
1294 23.77493	20.41565 19.79999	3.575349	40.233368	1.580426	N-40	600	644	M84										
865 23.58904	19.43292 19.5976	3.591445	4.223212	1.567329														
954 23.87992	19.33547 19.33043	4.549495	0.337299	0.291522	9	1.225304	0.856565	1.002233										
4533	19.32539	0			55	0.566992	1.457843	1.058342 1.033997										
	NA NA				55	1.12192 0.797155	0.971838	1.005524										
	NA DECEMBER 18 DECEMPT	410711	0.438984	0.111114	-	1.013947	1.331734	1.011078										
219	19.27433				ST DRV	0.299127	0.310994	0.038111										
	CBN	CBN	CBN	CBN		0.122118	0.126718	0.015559										
1622 23.81395	19.45725 19.33506	4.578884	0.109434	0.926953	Myrer	sin CBO	CBN	MER										
193 24 23868	20.47224 20.33816	4.00052	-0.468931	1.384083	51	0.659615	1.227124	1.000351										
1824 25.1019	20.09293 19.89929	5 20261	0.402544	0.756523		0.575405	1.347923	1.035373										
111 25.19946	20.47146 19.68438	5.515041	0.715016	0.609198		0.780243	0.725697	1.00095										
241 23 59799	20.4855 13.8506	4.136783	-0.451108	1.54709	*	0.553047	0.237895	1.00005										
216	19,21571	4.121936	0.445995	1.381232	AVS ST DEV	0.76669	0.273682	1.012225										
0138	19.75656	4 100110	0.081878		SIM	0.085313	0.111732	0.005455										
491	NA	• • • • • •	0.070071	10000	Pellish	6n CBO	CBN	M24										
1975 24.45639	20.13997 20.40282 20.63567	4.053572	-0.161085	1.114128	51	0.739796	1.121922	1.020155										
227 24.66095 9964	20.13485 20.00139 19.87293	4.659566	0.44737	0.733378	9	0.761215	1.058321 3.172999	1.015218										
1601 24.30132	19.9507 19.68209	5.619228	0.807032	0.571557	54	0.758226	5.234772	1.022543										
4396 24.32741	19.76108 19.70597	4.624045	0.50535	0.704538		0.489378	0.83619	1.010648										
216 24 56518	20.01044 20.18237	4.380805	0.262011	0.833925	AVS	0.650024	1.023475	1.021305										
339	10.090				STORY	0.048904	0.062652	0.007817										
013 24.66158	MTH 20.40211 20.37022	4.291353	40.178087	1.121383	Mycoh	64 (80)	CON	MIN										
1303	20.27832	4.46945	0.1280#2	0.001874		0.512343	0.96607	1.0051**										
1182	20.74127	4,647538			9	1.115288	0.945819	1.019849										
264 24.8.0564	20.22933	2 4,80005	5 0.270066	0.858526	59 54	0.518843	2.04664	1.005396										
1818 * 25.46352 1524	20.81294 20.88352 20.95611	4.579999	40.2200646	1.064787	55 56	0.430403 0.480911	0.741665 0.756784	1.000885										
1251 25.18405	20.7115 20.36059	4.823454	0.235563	0.849354	ANS	0.73368	1.105340	1.030632										
932 24.00098	19.3764 19.65865	4.352329	40.235563	1.177366	ST DEV	0.511905	0.519995	0.058951										
1072 23.09292	19.16657 19.29067	4.422849	0.188192	0.877705	304	0.000.004	C.1.(199)											
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## ONE-WAY ANOVA qPCR (1uM)



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New Info	6 CBD vs. CBN	0.02521	-0.3094 to 0.2589	No	08	0.9712	A-B		++
Results     Source Alloy/A of Mulfs	7 CBD vs. MTH -4	0.08860	-0.3727 to 0.1955	No	ns	0.7028	A-C		
one-way ANOVA of Myrb	8 CBN vs. MTH 4	0.06338	-0.3475 to 0.2208	No	ns	0.8330	B-C		
one-way ANOVA of Myogenin	9								
one-way ANOVA of Follistatin	10 Test details N	llean 1	Mean 2	Mean Diff.	SE of diff.	n1	n2	q	DF
one-way ANOVA of Myostatin	11 CBD vs. CBN 0	0.9185	0.9437	-0.02521	0.1094	6	6	0.3259	15
Granbs	12 CBD vs. MTH 0	0.9185	1.007	-0.08860	0.1094	6	6	1.145	15
Myf5	13 CBN vs. MTH 0	).9437	1.007	-0.06338	0.1094	6	6	0.8194	15
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No         No<	New Info	5	Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P V	alue			
Other way ANOVA of MypSi         7         C BD vs. MTH         0.01813         0.328 to 0.3568         No         ns         0.8913         AC         Image: Control of MysSime (Control of MysSime (Con	▼ Results	» 6	CBD vs. CBN	-0.1928	-0.5675 to 0.1819	No	ns	0.3977		A-B	_	
Other         ADVA of Myogen         6         CH         CH         COMe to 543         no         no         no         def82         B-C         Image: Come to 34000           © met-way ADVA of Myogen         9         0         Man 1         Man 2         Man 10         Se of dif.         n1         a2         q         D <td< td=""><td>one-way ANOVA of Myf5</td><td>7</td><td>CBD vs. MTH</td><td>-0.01813</td><td>-0.3928 to 0.3566</td><td>No</td><td>ns</td><td>0.9913</td><td></td><td>A-C</td><td>_</td><td></td></td<>	one-way ANOVA of Myf5	7	CBD vs. MTH	-0.01813	-0.3928 to 0.3566	No	ns	0.9913		A-C	_	
Image: marrier         Image: marrier         Image: marrier         Man 1         Man 2         Man 1         Man 2         Man 1         Man 2         Man 1	e one-way ANOVA of MyoD	8	CBN vs. MTH	0.1747	-0.2000 to 0.5493	No	ns	0.4652		B-C	_	
Def of way AND/A of Foldiality     10     Tet defails     Men 1     Men 2     Men 2     Ref of mail     nt     n2     q     DF       0     for marky AND/A of Foldiality     10     1206     0.1433     6.0     6.0     150     15       0     for marky AND/A of Poldiality     10     10.3     10.31     0.0143     6.0     6.0     10.0     15       0     for marky AND/A of Poldiality     10     10.31     10.31     0.0143     6.0     6.0     10.0     15       0     for marky AND/A of Poldiality     10     10.31     0.0143     0.1433     6.0     6.0     10.0     15       0     for marky AND/A of Poldiality     10     10.31     0.0143     0.1433     6.0     6.0     10.0     15       0     for marky AND/A     16     10.0     10.01     0.1747     0.1433     6.0     6.0     1772     15       0     for marky AND/A     16     10.0     10.01     0.1747     0.1433     6.0     1772     15       0     for marky AND/A     16     10.0     10.01     1772     16     1772     16     1772     16       0     for marky AND/A     16     10.0     10.01	one-way ANOVA of Myogenin	9									_	
Color     Alexa Addition servicality     11     CBD vs. CBN     1013     1208     0.1483     6     6     0.177     15       V apple     13     CBD vs. CBN     1013     1031     0.0183     0.1483     6     6     0.177     15       V apple     13     CBD vs. CBN     1206     1031     0.1142     0.1483     6     6     0.177     15       C Mord     13     CBN vs. MTH     1206     1031     0.1747     0.1483     6     6     0.177     15       C Mord     15     CBN vs. MTH     1206     1031     0.1747     0.1483     6     6     0.177     15       C Mord     15     CBN vs. MTH     1206     1031     0.1747     0.1483     6     6     0.177     15       C Mord of mycality     15     CBN vs. MTH     1206     1031     0.1747     0.1483     6     6     0.172     15       C Mord of mycality     15     CBN vs. MTH     1206     1031     0.1747     0.1483     6     6     172     15       C Mord of mycality     17     CBN vs. MTH     1206     1041     CBN vs. MTH     1206     1041     1041     1041     1041     1041	= one-way ANOVA of Hupstatin	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1		n2	q	DF
Open         State         State <ths< td=""><td>blaw doalwrie</td><td>11</td><td>CBD vs. CBN</td><td>1.013</td><td>1.206</td><td>-0.1928</td><td>0.1443</td><td>6</td><td></td><td>6</td><td>1.890</td><td>15</td></ths<>	blaw doalwrie	11	CBD vs. CBN	1.013	1.206	-0.1928	0.1443	6		6	1.890	15
Owder         13         CBW w.MTH         1206         1.031         0.1747         0.143         6         6         1.712         15           CMMpdefini         15         15         15         15         15         16	▼ Graphs	>> 12	CBD vs. MTH	1.013	1.031	-0.01813	0.1443	6		6	0.1777	15
Import     14	Myf5	13	CBN vs. MTH	1.206	1.031	0.1747	0.1443	6		6	1.712	15
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New Info	6	CBD vs. CBN	-0.2684	-0.5668 to 0.03007	No	ns	0.0812	A-B			tt
▼ Results >>	7	CBD vs. MTH	-0.2455	-0.5440 to 0.05292	No	ns	0.1158	A-C			tΠ
ane-way ANOVA of MyoD	8	CBN vs. MTH	0.02286	-0.2756 to 0.3213	No	ns	0.9785	B-C			ti
E one-way ANOVA of Myogenin	9										tl
= one-way ANOVA of Follistatin	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1	n2	a	DF	Ηľ
i one-way ANOVA of Myostatin	11	CBD vs. CBN	0.7667	1.035	-0.2684	0.1149	6	6	3.303	15	
① New Analysis	12	CBD vs. MTH	0.7667	1.012	-0.2455	0.1149	6	6	3.022	15	
▼ Graphs >>	13	CBN vs. MTH	1.035	1.012	0.02286	0 1149	6	6	0.2813	15	
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Project Info 1     O New Jafa	5	Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adjusted P Value					
Results	6	CBD vs. CBN	-0.3735	-0.5778 to -0.1691	Yes	***	0.0007	A-B				
appe-way ANOVA of My/5	7	CBD vs. MTH	-0.3713	-0.5756 to -0.1669	Yes	***	0.0008	A-C				
= one-way ANOVA of MyoD	8	CBN vs. MTH	0.002169	-0.2022 to 0.2065	No	ns	0.9996	B-C				
= one-way ANOVA of Myogenin	9											
one-way ANOVA of Follistatin	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1	n2	q	DF		
one-way ANOVA of Myostatin	11	CBD vs. CBN	0.6500	1.023	-0.3735	0.07867	6	6	6.713	15		
New Analysis	12	CBD vs. MTH	0.6500	1.021	-0.3713	0.07867	6	6	6.674	15		
♥ Graphs >>	13	CBN vs. MTH	1.023	1.021	0.002169	0.07867	6	6	0.03899	15		
Myrb Myrb	14											
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<ol> <li>Project info 1</li> </ol>	5	Tukey's multiple comparisons test	Mean Diff.	95.00% CI of diff.	Significant?	Summary	Adju	sted P Valu	•			
New Info	. 6	CBD vs. CBN	-0.3723	-1.006 to 0.2614	No	ns	0.30	3		A-B		
e one-way ANOVA of My15	" 7	CBD vs. MTH	-0.2370	-0.8706 to 0.3967	No	ns	0.60	54		A-C		
e one-way ANOVA of MyoD	8	CBN vs. MTH	0.1353	-0.4983 to 0.7690	No	ns	0.84	57		B-C		
e one-way ANOVA of Myogenin	9											
e one-way ANOVA of Follistatin	10	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.	n1			n2	q	DF
one-way ANOVA of Myostatin	11	CBD vs. CBN	0.7937	1.166	-0.3723	0.2440	6			6	2.158	15
rew Analysis      Granbs	12	2 CBD vs. MTH	0.7937	1.031	-0.2370	0.2440	6			6	1.374	15
Myf5	13	GBN vs. MTH	1.166	1.031	0.1353	0.2440	6			6	0.7845	15
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## REFERENCES

- Mcleod, M., Breen, L., Hamilton, D. L., & Philp, A. (2016). Live strong and prosper: the importance of skeletal muscle strength for healthy ageing. *Biogerontology*, *17*(3), 497–510. doi: 10.1007/s10522-015-9631-7
- Argilés, J. M., Campos, N., Lopez-Pedrosa, J. M., Rueda, R., & Rodriguez-Mañas, L. (2016). Skeletal Muscle Regulates Metabolism via Interorgan Crosstalk: Roles in Health and Disease. *Journal of the American Medical Directors Association*, 17(9), 789–796. doi: 10.1016/j.jamda.2016.04.019
- Lexell, J. (1993). What is the Cause of the Ageing Atrophy? Assessment of the Fiber Type Composition in Whole Human Muscles. *Sensorimotor Impairment in the Elderly*, 143–153. doi: 10.1007/978-94-011-1976-4 10
- Murray, M. P., Duthie, E. H., Gambert, S. R., Sepic, S. B., & Mollinger, L. A. (1985). Age-Related Differences in Knee Muscle Strength in Normal Women. *Journal of Gerontology*, 40(3), 275–280. doi: 10.1093/geronj/40.3.275
- Murray, M. P., Gardner, G. M., Mollinger, L. A., & Sepic, S. B. (1980). Strength of Isometric and Isokinetic Contractions. *Physical Therapy*, 60(4), 412–419. doi: 10.1093/ptj/60.4.412
- Caldwell, T., & Levac, J. (2017, February 13). The high cost of falling down: Why falls are an overlooked health crisis. Retrieved from https://ottawacitizen.com/news/local-news/the-high-cost-of-falling-down-whyfalls-are-an-overlooked-health-crisis.

- Dickinson, J. M., Volpi, E., & Rasmussen, B. B. (2013). Exercise and Nutrition to Target Protein Synthesis Impairments in Aging Skeletal Muscle. *Exercise and Sport Sciences Reviews*, 41(4), 216–223. doi: 10.1097/jes.0b013e3182a4e699
- Churchward-Venne, T. A., Breen, L., Donato, D. M. D., Hector, A. J., Mitchell, C. J., Moore, D. R., ... Phillips, S. M. (2013). Leucine supplementation of a lowprotein mixed macronutrient beverage enhances myofibrillar protein synthesis in young men: a double-blind, randomized trial. *The American Journal of Clinical Nutrition*, 99(2), 276–286. doi: 10.3945/ajcn.113.068775
- Drey, M., Grösch, C., Neuwirth, C., Bauer, J., & Sieber, C. (2013). The Motor Unit Number Index (MUNIX) in sarcopenic patients. *Experimental Gerontology*, 48(4), 381–384. doi: 10.1016/j.exger.2013.01.011
- Kwan, P. (2014). Erratum to "Sarcopenia, A Neurogenic Syndrome?" Journal of Aging Research, 2014, 1–2. doi: 10.1155/2014/751469
- Chabi, B., Ljubicic, V., Menzies, K. J., Huang, J. H., Saleem, A., & Hood, D. A. (2008). Mitochondrial function and apoptotic susceptibility in aging skeletal muscle. *Aging Cell*, 7(1), 2–12. doi: 10.1111/j.1474-9726.2007.00347.x
- Ljubicic, V., Joseph, A.-M., Adhihetty, P. J., Huang, J. H., Saleem, A., Uguccioni, G., & Hood, D. A. (2009). Molecular basis for an attenuated mitochondrial adaptive plasticity in aged skeletal muscle. *Aging*, *1*(9), 818–830. doi: 10.18632/aging.100083
- Calvani, R., Joseph, A.M., Adhihetty, P. J., Miccheli, A., Bossola, M., Leeuwenburgh, C., ... Marzetti, E. (2013). Mitochondrial pathways in sarcopenia

of aging and disuse muscle atrophy. *Biological Chemistry*, *394*(3), 393–414. doi: 10.1515/hsz-2012-0247

- 14. Alway, S. E., Degens, H., Krishnamurthy, G., & Smith, C. A. (2002). Potential role for myogenic repressors in apoptosis and attenuation of hypertrophy in muscles of aged rats. *American Journal of Physiology-Cell Physiology*, 283(1). doi: 10.1152/ajpcell.00598.2001
- Alway, S. E., Morissette, M. R., & Siu, P. M. (2011). Aging and Apoptosis in Muscle. *Handbook of the Biology of Aging*, 63–118. doi: 10.1016/b978-0-12-378638-8.00004-x
- Snijders, T., Nederveen, J. P., Mckay, B. R., Joanisse, S., Verdijk, L. B., Loon, L. J. C. V., & Parise, G. (2015). Satellite cells in human skeletal muscle plasticity. *Frontiers in Physiology*, 6. doi: 10.3389/fphys.2015.00283
- Verdijk, L. B., Snijders, T., Drost, M., Delhaas, T., Kadi, F., & Loon, L. J. C. V.
   (2014). Satellite cells in human skeletal muscle; from birth to old age. *Age*, *36*(2), 545–557. doi: 10.1007/s11357-013-9583-2
- Brack, A. S. (2005). Evidence that satellite cell decrement contributes to preferential decline in nuclear number from large fibres during murine age-related muscle atrophy. *Journal of Cell Science*, *118*(20), 4813–4821. doi: 10.1242/jcs.02602
- Verdijk, L. B., Snijders, T., Beelen, M., Savelberg, H. H., Meijer, K., Kuipers, H.,
   & Loon, L. J. V. (2010). Characteristics of Muscle Fiber Type Are Predictive of

Skeletal Muscle Mass and Strength in Elderly Men. *Journal of the American Geriatrics Society*, *58*(11), 2069–2075. doi: 10.1111/j.1532-5415.2010.03150.x

- 20. Suetta, C., Frandsen, U., Mackey, A. L., Jensen, L., Hvid, L. G., Bayer, M. L., ... Kjaer, M. (2013). Ageing is associated with diminished muscle re-growth and myogenic precursor cell expansion early after immobility-induced atrophy in human skeletal muscle. *The Journal of Physiology*, *591*(15), 3789–3804. doi: 10.1113/jphysiol.2013.257121
- Sousa-Victor, P., Gutarra, S., García-Prat, L., Rodriguez-Ubreva, J., Ortet, L., Ruiz-Bonilla, V., ... Muñoz-Cánoves, P. (2014). Geriatric muscle stem cells switch reversible quiescence into senescence. *Nature*, *506*(7488), 316–321. doi: 10.1038/nature13013
- 22. Broek, R. W. T., Grefte, S., & Hoff, J. W. V. D. (2010). Regulatory factors and cell populations involved in skeletal muscle regeneration. *Journal of Cellular Physiology*. doi: 10.1002/jcp.22127
- 23. Holterman, C. E., & Rudnicki, M. A. (2005). Molecular regulation of satellite cell function. *Seminars in Cell & Developmental Biology*, *16*(4-5), 575–584. doi: 10.1016/j.semcdb.2005.07.004
- 24. Tajbakhsh, S. (2003). Stem cells to tissue: molecular, cellular and anatomical heterogeneity in skeletal muscle. *Current Opinion in Genetics & Development*, 13(4), 413–422. doi: 10.1016/s0959-437x(03)00090-x

- 25. Seale, P., Sabourin, L. A., Girgis-Gabardo, A., Mansouri, A., Gruss, P., &
  Rudnicki, M. A. (2000). Pax7 Is Required for the Specification of Myogenic
  Satellite Cells. *Cell*, *102*(6), 777–786. doi: 10.1016/s0092-8674(00)00066-0
- 26. Holliday, R., & Pugh, J. (1975). DNA modification mechanisms and gene activity during development. *Science*, *187*(4173), 226–232. doi: 10.1126/science.1111098
- 27. Riggs, A. D. (1984). X Inactivation, DNA Methylation, and Differentiation Revisited. *DNA Methylation Springer Series in Molecular Biology*, 269–278. doi: 10.1007/978-1-4613-8519-6\_13
- Mcpherron, A. C., & Lee, S.-J. (2002). Suppression of body fat accumulation in myostatin-deficient mice. *Journal of Clinical Investigation*, *109*(5), 595–601. doi: 10.1172/jci200213562
- Mcpherron, A. C., Lawler, A. M., & Lee, S.-J. (1997). Regulation of skeletal muscle mass in mice by a new TGF-p superfamily member. *Nature*, 387(6628), 83–90. doi: 10.1038/387083a0
- 30. Welle, S., Bhatt, K., Pinkert, C. A., Tawil, R., & Thornton, C. A. (2007). Muscle growth after postdevelopmental myostatin gene knockout. *American Journal of Physiology-Endocrinology and Metabolism*, 292(4). doi:

10.1152/ajpendo.00531.2006

31. Grobet, L., Martin, L. J. R., Poncelet, D., Pirottin, D., Brouwers, B., Riquet, J., ...
Georges, M. (1997). A deletion in the bovine myostatin gene causes the double–
muscled phenotype in cattle. *Nature Genetics*, *17*(1), 71–74. doi: 10.1038/ng099771

- 32. Kambadur, R., Sharma, M., Smith, T. P., & Bass, J. J. (1997). Mutations in myostatin(GDF8) in Double-Muscled Belgian Blue and Piedmontese Cattle. *Genome Research*, 7(9), 910–915. doi: 10.1101/gr.7.9.910
- Mcpherron, A. C., Lawler, A. M., & Lee, S.-J. (1997). Regulation of skeletal muscle mass in mice by a new TGF-p superfamily member. *Nature*, 387(6628), 83–90. doi: 10.1038/387083a0
- 34. Mosher, D. S., Quignon, P., Bustamante, C. D., Sutter, N. B., Mellersh, C. S., Parker, H. G., & Ostrander, E. A. (2005). A Mutation in the Myostatin Gene Increases Muscle Mass and Enhances Racing Performance in Heterozygote Dogs. *PLoS Genetics*, *preprint*(2007). doi: 10.1371/journal.pgen.0030079.eor
- 35. Seibert, M. J., Xue, Q.-L., Fried, L. P., & Walston, J. D. (2001). Polymorphic Variation in the Human Myostatin (GDF-8) Gene and Association with Strength Measures in the Womens Health and Aging Study II Cohort. *Journal of the American Geriatrics Society*, 49(8), 1093–1096. doi: 10.1046/j.1532-5415.2001.49214.x
- 36. Jeanplong, F., Bass, J., Smith, H., Kirk, S., Kambadur, R., Sharma, M., & Oldham, J. (2003). Prolonged underfeeding of sheep increases myostatin and myogenic regulatory factor Myf-5 in skeletal muscle while IGF-I and myogenin are repressed. *Journal of Endocrinology*, *176*(3), 425–437. doi: 10.1677/joe.0.1760425
- 37. Yarasheski, K. E., Bhasin, S., Sinha-Hikim, I., Pak-Loduca, J., & Gonzalez-David, N. F. (2002). Serum Myostatin-Immunoreactive Protein Is Increased in

60–92 Year Old Women and Men with Muscle Wasting. *The Journal of Nutrition Health and Aging*, 6(5), 8-343.

- 38. Bergen, H. R., Farr, J. N., Vanderboom, P. M., Atkinson, E. J., White, T. A., Singh, R. J., ... Lebrasseur, N. K. (2015). Myostatin as a mediator of sarcopenia versus homeostatic regulator of muscle mass: insights using a new mass spectrometry-based assay. *Skeletal Muscle*, 5(1). doi: 10.1186/s13395-015-0047-5
- Ratkevicius, A., Joyson, A., Selmer, I., Dhanani, T., Grierson, C., Tommasi, A. M., ... Wackerhage, H. (2011). Serum Concentrations of Myostatin and Myostatin-Interacting Proteins Do Not Differ Between Young and Sarcopenic Elderly Men. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 66A(6), 620–626. doi: 10.1093/gerona/glr025
- 40. Szulc, P., Schoppet, M., Goettsch, C., Rauner, M., Dschietzig, T., Chapurlat, R., & Hofbauer, L. C. (2012). Endocrine and Clinical Correlates of Myostatin Serum Concentration in Men—the STRAMBO Study. *The Journal of Clinical Endocrinology & Metabolism*, 97(10), 3700–3708. doi: 10.1210/jc.2012-1273
- 41. Lakshman, K. M., Bhasin, S., Corcoran, C., Collins-Racie, L. A., Tchistiakova, L., Forlow, S. B., ... Lavallie, E. R. (2009). Measurement of myostatin concentrations in human serum: Circulating concentrations in young and older men and effects of testosterone administration. *Molecular and Cellular Endocrinology*, 302(1), 26–32. doi: 10.1016/j.mce.2008.12.019

- 42. Hill, J. J., Davies, M. V., Pearson, A. A., Wang, J. H., Hewick, R. M., Wolfman, N. M., & Qiu, Y. (2002). The Myostatin Propeptide and the Follistatin-related Gene Are Inhibitory Binding Proteins of Myostatin in Normal Serum. *Journal of Biological Chemistry*, 277(43), 40735–40741. doi: 10.1074/jbc.m206379200
- 43. Hill, J. J., Qiu, Y., Hewick, R. M., & Wolfman, N. M. (2003). Regulation of Myostatin in Vivo by Growth and Differentiation Factor-Associated Serum Protein-1: A Novel Protein with Protease Inhibitor and Follistatin Domains. *Molecular Endocrinology*, 17(6), 1144–1154. doi: 10.1210/me.2002-0366
- 44. Mckay, B. R., Ogborn, D. I., Bellamy, L. M., Tarnopolsky, M. A., & Parise, G. (2012). Myostatin is associated with age-related human muscle stem cell dysfunction. *The FASEB Journal*, *26*(6), 2509–2521. doi: 10.1096/fj.11-198663
- 45. Siriett, V., Platt, L., Salerno, M. S., Ling, N., Kambadur, R., & Sharma, M.
  (2006). Prolonged absence of myostatin reduces sarcopenia. *Journal of Cellular Physiology*, 209(3), 866–873. doi: 10.1002/jcp.20778
- 46. Amirouche, A., Durieux, A.-C., Banzet, S., Koulmann, N., Bonnefoy, R., Mouret, C., ... Freyssenet, D. (2009). Down-Regulation of Akt/Mammalian Target of Rapamycin Signaling Pathway in Response to Myostatin Overexpression in Skeletal Muscle. *Endocrinology*, *150*(1), 286–294. doi: 10.1210/en.2008-0959
- 47. Winter, J. P. D., Dijke, P. T., Vries, C. J. D., Achterberg, T. A. V., Sugino, H.,Waele, P. D., ... Adriana J.m. Van Den Eijnden-Van Raaij. (1996). Follistatin

neutralize activin bioactivity by inhibition of activin binding to its type II receptors. *Molecular and Cellular Endocrinology*, *116*(1), 105–114. doi: 10.1016/0303-7207(95)03705-5

- 48. Lin, S., Phillips, D., & Kretser, D. D. (2003). Regulation of ovarian function by the TGF-beta superfamily and follistatin. *Reproduction*, 133–148. doi: 10.1530/rep.0.1260133
- 49. Lee, S.J., & Mcpherron, A. C. (2001). Regulation of myostatin activity and muscle growth. *Proceedings of the National Academy of Sciences*, 98(16), 9306– 9311. doi: 10.1073/pnas.151270098
- 50. Lee, S.J. (2007). Quadrupling Muscle Mass in Mice by Targeting TGF-β Signaling Pathways. *PLoS ONE*, *2*(8). doi: 10.1371/journal.pone.0000789
- 51. Evans, L., Muttukrishna, S., & Groome, N. (1998). Development, validation and application of an ultra-sensitive two-site enzyme immunoassay for human follistatin. *Journal of Endocrinology*, *156*(2), 275–282. doi: 10.1677/joe.0.1560275
- 52. Gilfillan, C. P., & Robertson, D. M. (1994). Development and validation of a radioimmunoassay for follistatin in human serum. *Clinical Endocrinology*, *41*(4), 453–461. doi: 10.1111/j.1365-2265.1994.tb02576.x

- 53. Khoury, R. H. (1995). Serum follistatin levels in women: evidence against an endocrine function of ovarian follistatin. *Journal of Clinical Endocrinology & Metabolism*, 80(4), 1361–1368. doi: 10.1210/jc.80.4.1361
- 54. Wakatsuki, M. (1996). Immunoradiometric assay for follistatin: serum immunoreactive follistatin levels in normal adults and pregnant women. *Journal of Clinical Endocrinology & Metabolism*, 81(2), 630–634. doi: 10.1210/jc.81.2.630
- 55. Woodruff, T. K., Sluss, P., Wang, E., Janssen, I., & Mersol-Barg, M. S. (1997). Activin A and follistatin are dynamically regulated during human pregnancy. *Journal of Endocrinology*, 152(2), 167–174. doi: 10.1677/joe.0.1520167
- 56. Rodino-Klapac, L. R., Haidet, A. M., Kota, J., Handy, C., Kaspar, B. K., & Mendell, J. R. (2009). Inhibition of myostatin with emphasis on follistatin as a therapy for muscle disease. *Muscle & Nerve*, *39*(3), 283–296. doi: 10.1002/mus.21244
- 57. Statistics Canada. (2017). Health Fact Sheets Use of nutritional supplements. Retrieved from https://www150.statcan.gc.ca/n1/pub/82-625x/2017001/article/14831-eng.htm.
- Binns, C. W., Lee, M. K., & Lee, A. H. (2018). Problems and Prospects: Public Health Regulation of Dietary Supplements. *Annual Review of Public Health*, 39(1), 403–420. doi: 10.1146/annurev-publhealth-040617-013638

- 59. Natural Science Regulations (2018). Retrieved from https://www.naturalscireg.ca/blog/2018/08/can-you-make-money-canada.
- 60. Vitamins & Minerals Canada: Statista Market Forecast. (2019). Retrieved from https://www.statista.com/outlook/18050000/108/vitamins-minerals/canada.
- Andrews, K. W., Roseland, J. M., Gusev, P. A., Palachuvattil, J., Dang, P. T., Savarala, S., ... Bailey, R. L. (2016). Analytical ingredient content and variability of adult multivitamin/mineral products: national estimates for the Dietary Supplement Ingredient Database. *The American Journal of Clinical Nutrition*, *105*(2), 526–539. doi: 10.3945/ajcn.116.134544
- 62. Use of Dietary Supplements by Military Personnel. (2008). *Institue of Medicine* .doi: 10.17226/12095
- 63. Government of Canada (2012). Pathway for Licensing Natural Health Products Making Modern Health Claims. Retrieved from https://www.canada.ca/en/healthcanada/services/drugs-health-products/natural-non-prescription/legislationguidelines/guidance-documents/pathway-licensing-making-modern-healthclaims.html.
- 64. Alway, S. E., Degens, H., Krishnamurthy, G., & Smith, C. A. (2002). Potential role for myogenic repressors in apoptosis and attenuation of hypertrophy in muscles of aged rats. *American Journal of Physiology-Cell Physiology*, 283(1). doi: 10.1152/ajpcell.00598.2001

\_\_\_

- 65. Aizpurua-Olaizola, O., Soydaner, U., Öztürk, E., Schibano, D., Simsir, Y.,
  Navarro, P., ... Usobiaga, A. (2016). Evolution of the Cannabinoid and Terpene
  Content during the Growth of Cannabis sativa Plants from Different Chemotypes. *Journal of Natural Products*, 79(2), 324–331. doi: 10.1021/acs.jnatprod.5b00949
- 66. Nagarkatti, P., Pandey, R., Rieder, S. A., Hegde, V. L., & Nagarkatti, M. (2009).
  Cannabinoids as novel anti-inflammatory drugs. *Future Medicinal Chemistry*, *1*(7), 1333–1349. doi: 10.4155/fmc.09.93
- 67. Klein, T. W. (2005). Cannabinoid-based drugs as anti-inflammatory therapeutics. *Nature Reviews Immunology*, *5*(5), 400–411. doi: 10.1038/nri1602
- 68. Hampson, A. J., Grimaldi, M., Axelrod, J., & Wink, D. (1998). Cannabidiol and (-) 9-tetrahydrocannabinol are neuroprotective antioxidants. *Proceedings of the National Academy of Sciences*, 95(14), 8268–8273. doi: 10.1073/pnas.95.14.8268
- Zuardi, A. W., Cosme, R. A., Graeff, F. G., & Guimarães, F. S. (1993). Effects of ipsapirone and cannabidiol on human experimental anxiety. *Journal of Psychopharmacology*, 7(1), 82–88. doi: 10.1177/026988119300700112
- 70. Musty, R. E. (1984). Possible Anxiolytic Effects Of Cannabidiol. *The Cannabinoids: Chemical, Pharmacologic, and Therapeutic Aspects*, 795–813. doi: 10.1016/b978-0-12-044620-9.50057-9

- Zuwardi, A. W., & Karniol, I. G. (1983). Changes in the conditioned emotional response of rats induced by 9-THC, CBD and mixture of the two cannabinoids. *Arquivos de Biologia e Tecnologia 26*, 391–397.
- 72. Giacoppo, S., Pollastro, F., Grassi, G., Bramanti, P., & Mazzon, E. (2017). Target regulation of PI3K/Akt/mTOR pathway by cannabidiol in treatment of experimental multiple sclerosis. *Fitoterapia*, *116*, 77–84. doi: 10.1016/j.fitote.2016.11.010
- 73. Iannotti, F. A., Pagano, E., Moriello, A. S., Alvino, F. G., Sorrentino, N. C., Dorsi, L., ... Marzo, V. D. (2018). Effects of non-euphoric plant cannabinoids on muscle quality and performance of dystrophic mdx mice. *British Journal of Pharmacology*, *176*(10), 1568–1584. doi: 10.1111/bph.14460
- 74. Elphick, M. R., & Egertova, M. (2001). The neurobiology and evolution of cannabinoid signalling. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 356(1407), 381–408. doi: 10.1098/rstb.2000.0787
- 75. Pertwee, R. G. (2009). Cannabinoid pharmacology: the first 66 years. *British Journal of Pharmacology*, 147(S1). doi: 10.1038/sj.bjp.0706406
- 76. Mackie, K. (2008). Cannabinoid Receptors: Where They are and What They do. *Journal of Neuroendocrinology*, 20(s1), 10–14. doi: 10.1111/j.1365-2826.2008.01671.x

- 77. Pacher, P., & Mechoulam, R. (2011). Is lipid signaling through cannabinoid 2 receptors part of a protective system? *Progress in Lipid Research*, 50(2), 193–211. doi: 10.1016/j.plipres.2011.01.001
- 78. Marzo, V. D. (2008). Targeting the endocannabinoid system: to enhance or reduce? *Nature Reviews Drug Discovery*, 7(5), 438–455. doi: 10.1038/nrd2553
- 79. Basavarajappa, B. (2007). Critical Enzymes Involved in Endocannabinoid Metabolism. *Protein & Peptide Letters*, 14(3), 237–246. doi: 10.2174/092986607780090829
- 80. Okamoto, Y., Wang, J., Morishita, J., & Ueda, N. (2007). Biosynthetic Pathways of the Endocannabinoid Anandamide. *ChemInform*, 38(47). doi: 10.1002/chin.200747259
- 81. Simon, G. M., & Cravatt, B. F. (2006). Endocannabinoid Biosynthesis Proceeding through Glycerophospho-N-acyl Ethanolamine and a Role for α/β-Hydrolase 4 in This Pathway. *Journal of Biological Chemistry*, 281(36), 26465–26472. doi: 10.1074/jbc.m604660200
- 82. Freund, T. F., Katona, I., & Piomelli, D. (2003). Role of Endogenous
  Cannabinoids in Synaptic Signaling. *Physiological Reviews*, *83*(3), 1017–1066.
  doi: 10.1152/physrev.00004.2003

- 83. Eibl, D., Eibl, R., & Pörtner, R. (2009). Mammalian Cell Culture Technology: An Emerging Field. *Cell and Tissue Reaction Engineering Principles and Practice*, 3–11. doi: 10.1007/978-3-540-68182-3
- 84. Simon-Assmann, P., Maffen, K., Fogh, J., and Zweibaum, A. (1983) Enterocytelike differentiation and polarization of the human colon carcinoma cell line Caco-2 in culture. *Biol. Cell* 47:323–330.
- Breemen, R. B. V., & Li, Y. (2005). Caco-2 cell permeability assays to measure drug absorption. *Expert Opinion on Drug Metabolism & Toxicology*, 1(2), 175– 185. doi: 10.1517/17425255.1.2.175
- 86. Cai, Y., Xu, C., Chen, P., Hu, J., Hu, R., Huang, M., & Bi, H. (2014).
  Development, validation, and application of a novel 7-day Caco-2 cell culture system. *Journal of Pharmacological and Toxicological Methods*, *70*(2), 175–181.
  doi: 10.1016/j.vascn.2014.07.001
- 87. Alhamoruni, A., Lee, A. C., Wright, K. L., Larvin, M., & Osullivan, S. E. (2010).
  Pharmacological Effects of Cannabinoids on the Caco-2 Cell Culture Model of
  Intestinal Permeability. *Journal of Pharmacology and Experimental Therapeutics*, 335(1), 92–102. doi: 10.1124/jpet.110.168237
- 88. Jin, X., Luong, T.-L., Reese, N., Gaona, H., Collazo-Velez, V., Vuong, C., ... Pybus, B. S. (2014). Comparison of MDCK-MDR1 and Caco-2 cell based permeability assays for anti-malarial drug screening and drug investigations.

Journal of Pharmacological and Toxicological Methods, 70(2), 188–194. doi: 10.1016/j.vascn.2014.08.002

- Berry, M. N., Grivell, A. R., Grivell, M. B., & Phillips, J. W. (1997). Isolated hepatocytes - past, present and future. *Cell Biology and Toxicology*, 13(4-5), 223-233.
- 90. Cooke, H., & Smith, B. (1986). Variability at the Telomeres of the Human X/Y
  Pseudoautosomal Region. *Cold Spring Harbor Symposia on Quantitative Biology*, 51(0), 213–219. doi: 10.1101/sqb.1986.051.01.026
- 91. Cagubore, P., Agostini, E., Alemà, S., Falcone, G., & Tatò, F. (1987). The v-myc oncogene is sufficient to induce growth transformation of chick neuroretina cells. *Nature*, 326(6109), 188–190. doi: 10.1038/326188a0
- 92. Ivascu, A., & Kubbies, M. (2006). Rapid Generation of Single-Tumor Spheroids for High-Throughput Cell Function and Toxicity Analysis. *Journal of Biomolecular Screening*, *11*(8), 922–932. doi: 10.1177/1087057106292763
- 93. Kelm, J. M., Timmins, N. E., Brown, C. J., Fussenegger, M., & Nielsen, L. K. (2003). Method for generation of homogeneous multicellular tumor spheroids applicable to a wide variety of cell types. *Biotechnology and Bioengineering*, *83*(2), 173–180. doi: 10.1002/bit.10655

- 94. Lin, R.Z., & Chang, H.Y. (2008). Recent advances in three-dimensional multicellular spheroid culture for biomedical research. *Biotechnology Journal*, 3(9-10), 1285–1285. doi: 10.1002/biot.1285
- 95. Tan, W., Krishnaraj, R., & Desai, T. A. (2001). Evaluation of Nanostructured Composite Collagen–Chitosan Matrices for Tissue Engineering. *Tissue Engineering*, 7(2), 203–210. doi: 10.1089/107632701300062831
- 96. Koutsilieris, M., Sourla, A., Pelletier, G., & Doillon, C. (2009). Threedimensional type I collagen gel system for the study of osteoblastic metastases produced by metastatic prostate cancer. *Journal of Bone and Mineral Research*, 9(11), 1823–1832. doi: 10.1002/jbmr.5650091120
- 97. Edmondson, R., Broglie, J. J., Adcock, A. F., & Yang, L. (2014). Three-Dimensional Cell Culture Systems and Their Applications in Drug Discovery and Cell-Based Biosensors. *ASSAY and Drug Development Technologies*, *12*(4), 207– 218. doi: 10.1089/adt.2014.573
- 98. Karlsson, H., Fryknäs, M., Larsson, R., & Nygren, P. (2012). Loss of cancer drug activity in colon cancer HCT-116 cells during spheroid formation in a new 3-D spheroid cell culture system. *Experimental Cell Research*, *318*(13), 1577–1585. doi: 10.1016/j.yexcr.2012.03.026
- 99. Sodek, K. L., Ringuette, M. J., & Brown, T. J. (2009). Compact spheroid formation by ovarian cancer cells is associated with contractile behavior and an

invasive phenotype. *International Journal of Cancer*, *124*(9), 2060–2070. doi: 10.1002/ijc.24188

- 100. Ikeda, K., Ito, A., Imada, R., Sato, M., Kawabe, Y., & Kamihira, M.
  (2017). In vitro drug testing based on contractile activity of C2C12 cells in an epigenetic drug model. *Scientific Reports*, 7(1). doi: 10.1038/srep44570
- Montesano, A., Luzi, L., Senesi, P., Mazzocchi, N., & Terruzzi, I. (2013).
   Resveratrol promotes myogenesis and hypertrophy in murine myoblasts. *Journal* of *Translational Medicine*, *11*(1), 310. doi: 10.1186/1479-5876-11-310
- Yaffe, D., & Saxel, O. (1977). Serial passaging and differentiation of myogenic cells isolated from dystrophic mouse muscle. *Nature*, 270(5639), 725– 727. doi: 10.1038/270725a0
- 103. Miller, J. B. (1990). Myogenic programs of mouse muscle cell lines: expression of myosin heavy chain isoforms, MyoD1, and myogenin. *The Journal* of Cell Biology, 111(3), 1149–1159. doi: 10.1083/jcb.111.3.1149
- 104. Koppe, R. I., Hallauer, P. L., Karpati, G., & Hastings, K. E. (1989). cDNA clone and expression analysis of rodent fast and slow skeletal muscle troponin I mRNAs. *Journal of Biological Chemistry*, 264(24), 14327–14333.

- 105. Gahlmann, R., & Kedes, L. (1990). Cloning, structural analysis, and expression of the human fast twitch skeletal muscle troponin C gene. *Journal of Biological Chemistry*, 265(34):21247-53
- 106. Parmacek, M. S., & Leiden, J. M. (1989). Structure and expression of the murine slow/cardiac troponin C gene. *Biol. Chem.*, 13217–13225.
- 107. Parmacek, M. S., & Leiden, J. M. (1990). The structure and regulation of expression of the murine fast skeletal troponin C gene. *Biol. Chem*, 15980–15976.
- 108. Bains, W., Ponte, P., Blau, H., & Kedes, L. (1984). Cardiac actin is the major actin gene product in skeletal muscle cell differentiation in vitro. *Molecular* and Cellular Biology, 4(8), 1449–1453. doi: 10.1128/mcb.4.8.1449
- 109. Olson, E. N., & Capatanaki. (1989). Developmental regulation of intermediate filament and actin mRNAs during myogenesis is disrupted by oncogenic ras genes. *Oncogene*, 907–913.
- Wang, Y. C., & Rubenstein, P. A. (1992). Choice of 3' cleavage/
  polyadenylation site in B-tropomyosin RNA processing is differentiationdependent in mouse BC3H muscle cells. *The Journal of Biological Chemistry*, 267(4) 2728-2736.

- 111. Cross-Doersen, D., & Isfort, R. (2003). A Novel Cell Based System for Evaluating Skeletal Muscle Cell Hypertrophy-Inducing Agents. *In Vitro Cellular* and Developmental Biology--Animal. doi: 10.1290/0304024
- Manabe, Y., & Fujii, N. L. (2016). Experimental research models for skeletal muscle contraction. *The Journal of Physical Fitness and Sports Medicine*, 5(5), 373–377. doi: 10.7600/jpfsm.5.373
- 113. Primary Cell Culture Basics. Retrieved from <u>https://www.sigmaaldrich.com/technical-documents/articles/biology/primary-cell-</u> <u>culture.html</u>.
- 114. Dasarathy, S., Dodig, M., Muc, S. M., Kalhan, S. C., & Mccullough, A. J. (2004). Skeletal muscle atrophy is associated with an increased expression of myostatin and impaired satellite cell function in the portacaval anastamosis rat. *American Journal of Physiology-Gastrointestinal and Liver Physiology*, 287(6). doi: 10.1152/ajpgi.00202.2004
- 115. Pampaloni, F., Reynaud, E. G., & Stelzer, E. H. K. (2007). The third dimension bridges the gap between cell culture and live tissue. *Nature Reviews Molecular Cell Biology*, 8(10), 839–845. doi: 10.1038/nrm2236
- 116. Kapałczyńska, M., Kolenda, T., Przybyła, W., Zajączkowska, M.,
   Teresiak, A., Filas, V., ... Lamperska, K. (2016). 2D and 3D cell cultures a

comparison of different types of cancer cell cultures. *Archives of Medical Science*. doi: 10.5114/aoms.2016.63743

- 117. Griffith, L. G., & Swartz, M. A. (2006). Capturing complex 3D tissue physiology in vitro. *Nature Reviews Molecular Cell Biology*, 7(3), 211–224. doi: 10.1038/nrm1858
- Langhans, S. A. (2018). Three-Dimensional in Vitro Cell Culture Models
   in Drug Discovery and Drug Repositioning. *Frontiers in Pharmacology*, 9. doi:
   10.3389/fphar.2018.00006
- Argilés, J. M., Campos, N., Lopez-Pedrosa, J. M., Rueda, R., &
   Rodriguez-Mañas, L. (2016). Skeletal Muscle Regulates Metabolism via
   Interorgan Crosstalk: Roles in Health and Disease. *Journal of the American Medical Directors Association*, 17(9), 789–796. doi: 10.1016/j.jamda.2016.04.019
- 120. Lexell, J. (1995). Human aging, muscle mass, and fiber type composition. *The Journal of Gerontology*, *50*, 11–16.
- 121. English, K. L., & Paddon-Jones, D. (2010). Protecting muscle mass and function in older adults during bed rest. *Current Opinion in Clinical Nutrition and Metabolic Care*, 13(1), 34–39. doi: 10.1097/mco.0b013e328333aa66
- 122. Zheng, H., Qiao, C., Tang, R., Li, J., Bulaklak, K., Huang, Z., ... Xiao, X.
  (2017). Follistatin N terminus differentially regulates muscle size and fat in vivo. *Experimental & Molecular Medicine*, 49(9). doi: 10.1038/emm.2017.135

- 123. Turcotte, L. M., Defor, T. E., Newell, L. F., Cutler, C. S., Verneris, M. R., Wu, J., ... Holtan, S. G. (2017). Donor and recipient plasma follistatin levels are associated with acute GvHD in Blood and Marrow Transplant Clinical Trials Network 0402. *Bone Marrow Transplant Clinical Trials Network*, *53*(1), 64–68. doi: 10.1038/bmt.2017.236
- 124. Dietary Supplement Use Reaches All Time High Available-for-purchase consumer survey reaffirms the vital role supplementation plays in the lives of most Americans. (2018). Retrieved from https://www.crnusa.org/newsroom/dietary-supplement-use-reaches-all-time-highavailable-purchase-consumer-survey-reaffirms.
- 125. Wolfe, R. R. (2017). Branched-chain amino acids and muscle protein synthesis in humans: myth or reality? *Journal of the International Society of Sports Nutrition*, 14(1). doi: 10.1186/s12970-017-0184-9
- 126. Clemesha, C. G., Thaker, H., & Samplaski, M. K. (2019). 'Testosterone Boosting' Supplements Composition and Claims Are not Supported by the Academic Literature. *The World Journal of Mens Health*, 37. doi: 10.5534/wjmh.190043
- Uojima, H., Sakurai, S., Hidaka, H., Kinbara, T., Sung, J. H., Ichita, C., ...
  Kobayashi, S. (2017). Effect of branched-chain amino acid supplements on muscle strength and muscle mass in patients with liver cirrhosis. *European Journal of Gastroenterology & Hepatology*, 29(12), 1402–1407. doi: 10.1097/meg.000000000000968

- 128. Yang, Y., Breen, L., Burd, N. A., Hector, A. J., Churchward-Venne, T. A., Josse, A. R., ... Phillips, S. M. (2012). Resistance exercise enhances myofibrillar protein synthesis with graded intakes of whey protein in older men. *British Journal of Nutrition*, *108*(10), 1780–1788. doi: 10.1017/s0007114511007422
- 129. Andersen, L. L., Tufekovic, G., Zebis, M. K., Crameri, R. M., Verlaan, G., Kjær, M., ... Aagaard, P. (2005). The effect of resistance training combined with timed ingestion of protein on muscle fiber size and muscle strength. *Metabolism*, 54(2), 151–156. doi: 10.1016/j.metabol.2004.07.012
- Candow, D. G., Burke, N. C., Smith-Palmer, T., & Burke, D. G. (2006).
   Effect of Whey and Soy Protein Supplementation Combined with Resistance
   Training in Young Adults. *International Journal of Sport Nutrition and Exercise Metabolism*, 16(3), 233–244. doi: 10.1123/ijsnem.16.3.233
- Hulmi, J. J., Tannerstedt, J., Selänne, H., Kainulainen, H., Kovanen, V., & Mero, A. A. (2009). Resistance exercise with whey protein ingestion affects
   mTOR signaling pathway and myostatin in men. *Journal of Applied Physiology*, *106*(5), 1720–1729. doi: 10.1152/japplphysiol.00087.2009
- Amar, M. B. (2006). Cannabinoids in medicine: A review of their therapeutic potential. *Journal of Ethnopharmacology*, *105*(1-2), 1–25. doi: 10.1016/j.jep.2006.02.001
- 133. Pertwee, R. G. (2008). The diverse CB1 and CB2 receptor pharmacology of three plant cannabinoids:  $\Delta 9$ -tetrahydrocannabinol, cannabidiol and  $\Delta 9$ -
tetrahydrocannabivarin. *British Journal of Pharmacology*, *153*(2), 199–215. doi: 10.1038/sj.bjp.0707442

Schier, A., Ribeiro, N., Coutinho, D., Machado, S., Arias-Carrion, O.,
Crippa, J., ... Silva, A. (2014). Antidepressant-Like and Anxiolytic-Like Effects of Cannabidiol: A Chemical Compound of Cannabis sativa. *CNS & Neurological Disorders - Drug Targets*, *13*(6), 953–960. doi:

10.2174/1871527313666140612114838

- Joseph, J. S., Malindisa, S. T., & Ntwasa, M. (2019). Two-Dimensional
  (2D) and Three-Dimensional (3D) Cell Culturing in Drug Discovery. *Cell Culture*. doi: 10.5772/intechopen.81552
- 136. Guillouzo, A., Corlu, A., Aninat, C., Glaise, D., Morel, F., & Guguen-Guillouzo, C. (2007). The human hepatoma HepaRG cells: A highly differentiated model for studies of liver metabolism and toxicity of xenobiotics. *Chemico-Biological Interactions*, 168(1), 66–73. doi: 10.1016/j.cbi.2006.12.003
- Macdonald, J. S., & Robertson, R. T. (2009). Toxicity Testing in the 21st
   Century: A View from the Pharmaceutical Industry. *Toxicological Sciences*, *110*(1), 40–46. doi: 10.1093/toxsci/kfp088
- Asfour, H. A., Allouh, M. Z., & Said, R. S. (2018). Myogenic regulatory factors: The orchestrators of myogenesis after 30 years of discovery. *Experimental Biology and Medicine*, *243*(2), 118–128. doi: 10.1177/1535370217749494
- 139.Cannabidiol solution C045. Retrieved from

https://www.sigmaaldrich.com/catalog/product/cerillian/c045?lang=en®ion.

- I40. Jankowski, C. (2010). Effects of aging on human skeletal muscle after
  immobilization and retraining. *Yearbook of Sports Medicine*, 2010, 360–361. doi:
  10.1016/s0162-0908(10)79691-4
- Thomas, M., Langley, B., Berry, C., Sharma, M., Kirk, S., Bass, J., & Kambadur, R. (2000). Myostatin, a Negative Regulator of Muscle Growth, Functions by Inhibiting Myoblast Proliferation. *Journal of Biological Chemistry*, 275(51), 40235–40243. doi: 10.1074/jbc.m004356200
- Langley, B., Thomas, M., Bishop, A., Sharma, M., Gilmour, S., &
  Kambadur, R. (2002). Myostatin Inhibits Myoblast Differentiation by Downregulating MyoD Expression. *Journal of Biological Chemistry*, 277(51), 49831–
  49840. doi: 10.1074/jbc.m204291200
- 143. Rodriguez, J., Vernus, B., Toubiana, M., Jublanc, E., Tintignac, L., Leibovitch, S., & Bonnieu, A. (2011). Myostatin inactivation increases myotube size through regulation of translational initiation machinery. *Journal of Cellular Biochemistry*, *112*(12), 3531–3542. doi: 10.1002/jcb.23280
- Cannabinoid Receptors and the Endocannabinoid System: Signaling and Function in the Central Nervous System. (2018). *International Journal of Molecular Sciences*, 19(3), 833. doi: 10.3390/ijms19030833
- 145. Amberznectarz. (2016, December 11). Cannabinoid Receptors and Cells. Retrieved from https://hempedification.wordpress.com/2016/12/11/cannabinoidreceptors-and-cells/

- 146. Zurier, R. B., & Burstein, S. H. (2016). Cannabinoids, inflammation, and fibrosis. *FASEB Journal*, *30*(11).
- 147. Andre, C. M., Hausman, J.-F., & Guerriero, G. (2016). Cannabis sativa:
  The Plant of the Thousand and One Molecules. *Frontiers in Plant Science*, 7. doi: 10.3389/fpls.2016.00019
- 148. Sofia, R. D., Knobloch, L. C., & Vassar, H. B. (1973). The anti-edema activity of various naturally occurring cannabinoids. *Research Communications in Chemical Pathology and Pharmacology*, 6(3).
- Mahadevan, A., Siegel, C., Martin, B. R., Abood, M. E., Beletskaya, I., & Razdan, R. K. (2000). Novel Cannabinol Probes for CB1 and CB2 Cannabinoid Receptors. *Journal of Medicinal Chemistry*, *43*(20), 3778–3785. doi: 10.1021/jm0001572
- 150. Allen, D. L., Roy, R. R., & Edgerton, V. R. (1999). Myonuclear domains in muscle adaptation and disease. *Muscle & Nerve*, 22(10), 1350–1360. doi: 10.1002/(sici)1097-4598(199910)22:10<1350::aid-mus3>3.0.co;2-8
- 151. Mammalian cell-cycle regulation: several Cdks, numerous cyclins and diverse compensatory mechanisms
- Satyanarayana, A., & Kaldis, P. (2009). Mammalian cell-cycle regulation: several Cdks, numerous cyclins and diverse compensatory mechanisms. *Oncogene*, 28(33), 2925–2939. doi: 10.1038/onc.2009.170
- Gutiérrez-Salmeán, G., Ortiz-Vilchis, P., Vacaseydel, C. M., Rubio-Gayosso, I., Meaney, E., Villarreal, F., ... Ceballos, G. (2014). Acute effects of an

oral supplement of (–)-epicatechin on postprandial fat and carbohydrate metabolism in normal and overweight subjects. *Food & Function*, 5(3), 521. doi: 10.1039/c3fo60416k

- 154. TRIzol Reagent User Guide Pub. no. MAN0001271 Rev. A. Retrieved from https://assets.thermofisher.com/TFS-Assets/LSG/manuals/trizol reagent.pdf
- 155. E.Z.N.A.® Tissue DNA Kit. Retrieved from

https://www.omegabiotek.com/product/e-z-n-a-tissue-dna-kit/

- 156. High-Capacity cDNA Reverse Transcription Kit. Retrieved from https://www.thermofisher.com/order/catalog/product/4368814?ICID=searchproduct#/4368814?ICID=search-product
- 157. MTT Assay Kit (Cell Proliferation) (ab211091). Retrieved from https://www.abcam.com/mtt-assay-kit-cell-proliferation-ab211091.html
- 158. C2C12 (ATCC® CRL-1772<sup>TM</sup>). Retrieved from

https://www.atcc.org/Products/All/CRL-1772.aspx#generalinformation

- 159. Trypsin-EDTA Solution 10X 59418C. Retrieved from https://www.sigmaaldrich.com/catalog/product/sigma/59418c?lang=en®ion
- 160. Trypan Blue Solution, 0.4%. Retrieved from

https://www.thermofisher.com/order/catalog/product/15250061#/15250061

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