

## Education

### **B.A. Biology - Grinnell College - Grinnell, IA**

2006 - 2010                      GPA: 3.51 / 4.00

### **PhD Molecular Physiology and Biophysics - University of Iowa - Iowa City, IA**

2011 - 2015                      GPA: 3.73 / 4.00

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## Work History

### **Synthetic Biology Applications Specialist - Integrated DNA Technologies - June 2017-Current**

- Provide customer support and technical assistance for IDT's line of synthetic DNA products.
- Support high value customers from pharmaceutical companies and academic institutions who use synthetic DNA for CRISPR/Cas genome editing, microbe engineering, and generating therapeutic protein and antibody libraries.
- Serve as technical resource for domestic and international sales staff.

### **Research Scientist - University of Iowa - PI Christopher Adams MD, PhD - 2015-2017**

- Continued research focused on discovering and characterizing new molecular mechanisms of acute and age-related skeletal muscle atrophy.
- Co-authored research showing that two natural small molecules reduce activity of the transcription factor ATF4 to prevent the loss of skeletal muscle mass and strength during aging.
- Presented research in posters at national conferences.
- Gained experience using RNA-sequencing, bioinformatics tools, CRISPR/Cas genome editing and HDR, and Tandem Affinity purification of protein complexes.
- Trained new staff on highly technical laboratory research techniques.

### **PhD Student - University of Iowa - PI Christopher Adams MD, PhD - 2011-2015**

- Used experimental systems to demonstrate that a compound from tomato plants, tomatidine, reduces skeletal muscle atrophy, causes skeletal muscle hypertrophy, and reduces adiposity.
- Gained experience in several molecular biology techniques.
- Regularly presented research in poster and talks at departmental and national science conferences.
- Received NIH F31 NRSA grant.
- Received best poster award at 2nd Cancer Cachexia Conference in Montreal, Canada.

### **Research Assistant - University of Iowa - PI Christopher Adams MD, PhD - 2010-2011**

- Performed breeding and genotyping of skeletal muscle specific knockout mice.
  - Maintained primary and immortalized cultured cells.
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## Technical Skills

### **• Molecular Biology, Genomics, and Model Systems**

Mouse tissue necropsy, DNA and RNA extraction from cells and tissue, DNA cloning using restriction enzymes and isothermal assembly, RT-qPCR, DNA sequence analysis, CRISPR/Cas9 gene editing and HDR knockin, RNA-Seq and bioinformatics using BaseSpace (Illumina), transfection of DNA and siRNA in mouse tissue and cultured cells, maintenance of immortal and primary cells, making transgenic and knockout mice, gene set enrichment, codon optimization for gene expression, and DNA synthesis and gene assembly.

### **• Protein Analysis and Histology**

Protein extraction from cultured cells and tissues, Bradford Assay, SDS-Page, immuno-histochemistry, mouse tissue sectioning and staining, and Tandem Affinity Purification.

### **• Software and Microscopy**

Proficient in Microsoft Office, Adobe Photoshop and Illustrator, Prism, NCBI, SnapGene, DNAWorks, GSEA, Ingenuity Pathway Analysis, and fluorescence and confocal microscopy.

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## Publications

DeRidder BP, Shybut ME, **Dyle MC**, Kremling KA, Shapiro MB. (2012) Changes at the 3'-untranslated region stabilize Rubisco activase transcript levels during heat stress in *Arabidopsis*. *Planta* 236(2): 463-76.

Ebert SM, **Dyle MC**, Kunkel SD, Bullard SA, Bongers KS, Fox DK, Dierdorff JM, Foster ED, Adams CM. (2012) Stress-induced skeletal muscle Gadd45a expression reprograms myonuclei and causes muscle atrophy. *The Journal of Biological Chemistry* 287: 27290-27301.

Kunkel SD, Elmore CJ, Bongers KS, Ebert SM, Fox DK, **Dyle MC**, Bullard SA, Adams CM. (2012) Ursolic acid increases skeletal muscle and brown fat and decreases diet-induced obesity, glucose intolerance and fatty liver disease. *PLoS ONE* 7:e39332.

Bongers KS, Fox DK, Ebert SM, Kunkel SD, **Dyle MC**, Bullard SA, Dierdorff JM, Adams CM. (2013) Skeletal muscle denervation causes skeletal muscle atrophy through a pathway that involves both Gadd45a and HDAC4. *Am J of Physiology - Endocrinology and Metabolism* 305: E907-E915.

Fox DK, Ebert SM, Bongers KS, **Dyle MC**, Bullard SA, Dierdorff JM, Kunkel SD, Adams CM. (2014) p53 and ATF4 mediate distinct and additive pathways to skeletal muscle atrophy during limb immobilization. *Am J of Physiology - Endocrinology and Metabolism* 307: E245-E261.

**Dyle MC**, Ebert SM, Cook DP, Kunkel SD, Fox DK, Bongers KS, Bullard SA, Dierdorff JM, Adams CM. (2014) Systems-based discovery of tomatidine as a natural small molecule inhibitor of skeletal muscle atrophy. *The Journal of Biological Chemistry* 289: 14913-14924. Covered in *Chemical and Engineering News* (92: 27-28, 2014), *SciBX*, *Fox News*, *Prevention*, *Yoga Journal*, *Bicycling*, *Men's Health*, and *Women's Health*.

Bongers KS, Fox DK, Kunkel SD, Strebounova LV, Murry DJ, Pufall MA, Ebert SM, **Dyle MC**, Bullard SA, Dierdorff JM, Adams CM. (2015) Spermine oxidase maintains basal skeletal muscle gene expression and fiber size, and is strongly repressed by conditions that cause skeletal muscle atrophy. *Am J of Physiology - Endocrinology and Metabolism* 308: E144-58.

Adams CM, Ebert SM, **Dyle MC**. (2015) Use of mRNA expression signatures to discover small molecule inhibitors of skeletal muscle atrophy. *Current Opinion in Clinical Nutrition and Metabolic Care* 18: 263-268.

Ebert SM, **Dyle MC**, Bullard SA, Dierdorff JM, Murry DJ, Fox DK, Bongers KS, Lira VA, Meyerholz DK, Talley JJ, Adams CM. (2015) Identification and small molecule inhibition of an Activating Transcription Factor (ATF4)-dependent pathway to age-related skeletal muscle weakness and atrophy. *The Journal of Biological Chemistry* 290(42): 25497-511.

Bullard SA, Seo S, Schilling B, **Dyle MC**, Dierdorff JM, Ebert SM, DeLau AD, Gibson BW, Adams CM. (2016) Gadd45a promotes skeletal muscle atrophy by forming a complex with the protein kinase MEKK4. *The Journal of Biological Chemistry* 291(34): 17496-509.

Adams CM, Ebert SM, **Dyle MC**. (2017) Role of ATF4 in skeletal muscle atrophy. *Current Opinion in Clinical Nutrition and Metabolic Care* 20(3): 164-168.

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## Patent

Adams CM, **Dyle MC**, and Welsh MJ. Tomatidine, Analogs Thereof, Compositions Comprising Same, and Uses for Same. PCT/US2013/53423. Filed August 2, 2013. Claiming priority to Provisional No. 61/679,432, filed on August 3, 2012.

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## Completed Research Support

### NIH NRSA Individual Predoctoral Fellowship - 2013-2015

Investigating the Molecular Mechanisms of Skeletal Muscle Atrophy - NIH 1F31 AG04603801