



2016

**New Directions in Biology and Disease
of Skeletal Muscle Conference**

PROGRAM BOOK

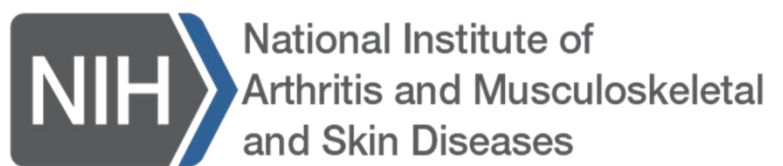
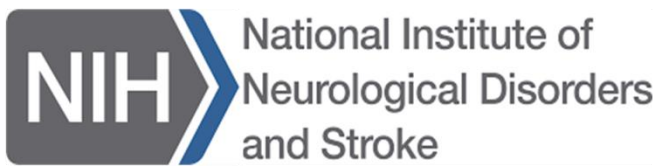
Wednesday, June 29, 2016 — Saturday, July 2, 2016

**Renaissance Orlando at SeaWorld
6677 Sea Harbor Drive
Orlando, FL 32821 USA**



2016 New Directions in Biology and Disease of Skeletal Muscle Conference

We would like to thank all of our sponsors for their contributions to our conference:



Objectives

The New Directions in Biology and Disease of Skeletal Muscle Conference is being held in Orlando, Florida June 29 – July 2, 2016. This meeting brings together scientists working to understand mechanisms and develop new therapies for muscle disease, especially the muscular dystrophies. The “New Directions” meeting differs from other topically related meetings because of its focus on bringing together industry and academic attendees with a focus on evaluating laboratory based observations and assessing or testing suitability for therapy in the preclinical and clinical setting. This meeting was developed in response to MD Care Act and the recognition that devising and testing therapy for rare neuromuscular disorders requires organization and coordinated efforts among all stakeholders. In addition to the focus on identifying and testing therapeutic pathways, the New Directions meeting places a high emphasis on inclusion of trainees and young investigators, as it is recognized that the challenges of these medical problems will require a diverse and prolonged effort to realize cures for these devastating disorders.

Objective 1: The presentation and sharing of unpublished data. This meeting emphasizes the presentation of unpublished work. Early access to information allows for new collaborations to form moving scientific discovery forward faster into translation.

Objective 2: Promotion of collaboration between industry and academic investigators. As targets are increasingly moving towards development, preclinical and clinical testing, the interaction and partnership between industry and academia is increasingly important. The first session of this meeting is designed to promote industry and advocacy group participation.

Objective 3: Clinical trial planning and outcome. We will devote a specific session to outcomes and endpoints for clinical trials for neuromuscular disease especially the muscular dystrophies and hope to contribute to improved consensus and understanding of appropriate expectations for clinical trials.

Objective 4: Identify both common and unique targets for each muscle disease. This meeting provides a format where multiple different mechanisms of muscle disease are covered providing a backdrop to identify common elements that can be manipulated therapeutically.

Objective 5: Provide trainees and young investigators a forum in which to present data and to encourage trainees to remain studying neuromuscular disease. Trainees are expected to present posters, and senior and junior investigators are engaged by evaluating these presentations.

Conference Organizers

Elizabeth McNally, Northwestern University
H. Lee Sweeney, University of Florida

Coordinators

Tharrie Daniels, Northwestern University
Christa Stout, University of Florida

Program Committee

Alan Beggs, Harvard University
James Ervasti, University of Minnesota
Miranda Grounds, University of Western Australia
Jill Rafael-Fortney, The Ohio State University
Melissa Spencer, University of California Los Angeles
Conrad Weihl, Washington University in St. Louis
Noah Weisleder, The Ohio State University

KEYNOTE SPEAKER

Daniel Kelly, M.D.

Sanford Burnham Prebys Medical Discovery Institute



Orchestration of Muscle Metabolism and Structure: A Question of Balance

Daniel Kelly, M.D.

*Tavistock Distinguished Professor and Scientific Director
Sanford Burnham Prebys Medical Discovery Institute at Lake Nona*

Dr. Kelly obtained his medical degree from the University Of Illinois College Of Medicine. He did a Postdoctoral Research Fellowship in the Department of Biological Chemistry at Washington University School of Medicine followed by Cardiology Fellowship training. Dr. Kelly joined the Washington University School of Medicine faculty in 1989 and rapidly moved up the ranks. While at Washington University, Dr. Kelly held the Lewin Professorship and served as Chief of the Cardiovascular Division, and was the founding Director of the Center for Cardiovascular Research. In 2008, Dr. Kelly assumed the role of founding Scientific Director for the Sanford Burnham Prebys Medical Discovery Institute located in Orlando, Florida focused on the metabolic origins of disease. Dr. Kelly's research interests stem from an early fascination with rare inborn errors in mitochondrial metabolism in children that cause sudden death, heart failure, and skeletal myopathies. As a young researcher at Washington University, Dr. Kelly defined the genetic basis for a common inborn error in mitochondrial fatty acid oxidation, work that led to the development of practical screening tests for newborns. Thereafter, he became interested in how similar derangements in striated muscle energy metabolism contribute to common forms of heart disease and insulin resistance including heart failure, metabolic syndrome, and diabetes. His work defined a transcriptional regulatory axis involved in the control of cardiac and skeletal mitochondrial biogenesis and fuel metabolism through pioneering fundamental work on nuclear receptors including the PPARs, estrogen-related receptors (ERRs), and their transcriptional coactivator, PGC-1. The Kelly laboratory has identified molecular "switches" in this regulatory pathway that potentially define distinct metabolic derangements that contribute to different forms of heart failure, an important step towards disease phenotype-specific treatment of heart disease. More recently, the Kelly laboratory has employed systems approaches (genomics, metabolomics, and proteomics), including cell-based high throughput chemical genomic screens to identify novel transcriptional regulatory pathways linking mitochondrial function with the contractile apparatus relevant to heart failure and skeletal muscle fitness. Dr. Kelly is a recipient of the American Heart Association Basic Research Prize and serves as an Associate Editor for *The Journal of Clinical Investigation* and *JACC: Basic to Translational Science*. He serves on the Editorial Boards of *Genes & Development* and *Nuclear Receptor Signaling*.



2016 New Directions in Biology and Disease of Skeletal Muscle Conference

June 29-July 2, 2016; Orlando, FL

Wednesday, June 29, 2016

Industry Workshop

- 12:00 - 12:10PM** **Welcome and Introductions**
- 12:10 - 12:40PM** **Larry Gold**, SomaLogic
The Proteomics Explosion
- 12:40 - 1:10PM** **Ilan Ganot**, Solid Biosciences
Developing Therapies for Duchenne Muscular Dystrophy
- 1:10 - 1:40PM** **Jon Tinsley**, Summit Therapeutics Inc.
Utrophin Modulators for the Treatment of Duchenne Muscular Dystrophy
- 1:40 - 2:10PM** **Joanne Donovan**, Catabasis Pharmaceuticals, Inc.
Edasalonexent (CAT-1004): An NF- κ B Inhibitor in Development for Duchenne Muscular Dystrophy
- 2:10 - 2:40PM** **COFFEE BREAK**
- 2:40 - 3:10PM** **Paolo Bettica**, Italfarmaco SpA
Givinostat an HDAC inhibitor in development for the treatment of Duchenne Muscular Dystrophy
- 3:10 - 3:40PM** **Jane Owens**, Pfizer Inc.
Rare Neuromuscular Disease Research at Pfizer
- 3:40 - 4:10PM** **Clifford Bechtold**, Bristol-Myers Squibb
BMS-986089: An anti-myostatin adnectin
- 4:10 - 4:40pm** **Ron Victor**, Cedars-Sinai Heart Institute
Results of the Lilly Tadalafil Trial
- 5:00 - 6:00PM** **Keynote Speaker: Daniel Kelly**, Sanford Burnham Prebys Medical Discovery Institute
Orchestration of muscle metabolism and structure: A question of balance
- 6:00 - 9:00PM** **Industry Outreach Poster Session and Evening Welcome Reception**
Crystal C Ballroom

Thursday, June 30, 2016

7:15 - 8:15AM Breakfast will be served in Atrium C

Session I: Muscle Disease Modifiers

Chair: Melissa Spencer

8:00 - 8:20AM **Melissa Spencer**, University of California, Los Angeles
Mechanisms Underlying Calpainopathy

8:20 - 8:40AM **Jill Rafael Fortney**, The Ohio State University
Mineralocorticoids in normal and dystrophic muscle

8:40 - 9:00AM **Evelyn Ralston**, National Institutes of Health
Understanding differences in microtubule organization between healthy and DMD/mdx skeletal muscle: dystrophin may not explain everything

9:00 - 9:20AM **Ahlke Heydemann**, University of Illinois
The mitochondrial genome impacts murine muscular dystrophy severity

9:20 - 9:40AM **Annemieke Aartsma-Rus**, Leiden University Medical Center
New function of the myostatin/activin type I receptor (ALK4) as a mediator of muscle atrophy and muscle regeneration

9:40 - 10:10AM COFFEE BREAK

Session II: Muscle Disease Modifiers II

Chair: Elizabeth McNally

10:10 - 10:30AM **Elizabeth McNally**, Northwestern University
LTBP4 as a modifier of muscular dystrophy

10:30 - 10:50AM **Silvere Van Der Maarel**, Leiden University
Epigenetic modifiers of DUX4 expression and disease presentation in FSHD.

10:50 - 11:10AM **Louis Kunkel**, Harvard University and Boston Children's Hospital
Genetic Modifiers of Muscular Dystrophy

11:10 - 11:30AM **Joel R. Chamberlain**, University of Washington
DUX4 protein expression in human FSHD biopsies and in a novel inducible adult mouse model of FSHD

11:30AM - 1:30PM LUNCH BREAK (on your own)

1:30 – 3:30PM Poster Session I

Sponsored by Catabasis Pharmaceuticals, Inc.

Session III: Autophagy & Turnover

Chair: Conrad Wehl

- 3:30 - 3:50PM** **Conrad Wehl**, Washington University at St. Louis
Protein Homeostasis in Muscle Disease
- 3:50 - 4:10PM** **Wolfgang Linke**, Ruhr-Universität Bochum
Chaperone-mediated control of titin spring function in normal and myopathic muscle
- 4:10 - 4:30PM** **Scott Harper**, The Ohio State University and Nationwide Children's Hospital
DUX4 inhibition as a therapeutic strategy for FSHD
- 4:30 - 4:50PM** **Ivor Benjamin**, Medical College of Wisconsin
Pathogenic Mechanisms of Protein-Aggregation Disorders Shared with Muscular Dystrophy
- 4:50 - 5:10PM** **Robert Bryson-Richardson**, Monash University
Myofibrillar myopathies: disease mechanisms and potential therapies.
- 5:10 - 5:30PM** **Amy D. Hanna**, Baylor College of Medicine
Targeting ER stress improves skeletal muscle function in a mouse model of RYR1-linked congenital myopathy

Friday, July 1, 2016

7:15 - 8:15AM **Breakfast will be served in Atrium C**

Session IV: Endpoints/Biomarkers

Chair: Kay Davies

- 8:00 - 8:20AM** **Kay Davies**, University of Oxford
Utrophin modulation of the therapy of Duchenne Muscular Dystrophy
- 8:20 - 8:40AM** **Krista Vandenborne**, University of Florida
MRI/MRS as a Biomarker for Duchenne Muscular Dystrophy
- 8:40 - 9:00AM** **Matthew Wood**, University of Oxford
Advanced oligonucleotide therapeutics for neuromuscular disease
- 9:00 - 9:20AM** **Lee Sweeney**, University of Florida
Biomarkers and Modifiers of Duchenne Muscular Dystrophy
- 9:20 - 9:40AM** **Jordi Díaz-Manera**, Hospital de la Santa Creu i Sant Pau
MRI and Physiotherapy Outcome Measures in a global multi-center dysferlinopathy study
- 9:40 - 10:10AM** **COFFEE BREAK**

Session V: Disease Mechanisms

Chair: James Ervasti

- 10:10 - 10:30AM** **Benjamin Prosser**, Perelman School of Medicine at the University of Pennsylvania
Microtubules in myocyte mechanobiology
- 10:30 - 10:50AM** **James Ervasti**, University of Minnesota
Microtubule perturbations in different models of DGC-opathy
- 10:50 - 11:10AM** **Eric S. Folker**, Boston College
Myonuclear position is disrupted by distinct mechanisms in Emery-Dreifuss Muscular Dystrophy and Centronuclear myopathy
- 11:10 - 11:30AM** **Pam M. Van Ry**, University of Nevada School of Medicine
Galectin-1 ameliorates disease pathology in two mouse models of Duchenne Muscular Dystrophy
- 11:30AM - 1:30PM** **LUNCH BREAK (on your own)**
- 1:30 – 3:30PM** **Poster Session II**
Sponsored by Catabasis Pharmaceuticals, Inc.

Session VI: Repair & Regeneration

Chair: Noah Weisleder

- 3:30 - 3:50PM** **Noah Weisleder**, The Ohio State University
Intracellular signaling responses that mediate membrane repair in striated muscle can compensate for membrane fragility in muscular dystrophy
- 3:50 - 4:10PM** **Robert Bloch**, University of Maryland School of Medicine
Dysferlin Stabilizes Calcium Signaling in Mature Skeletal Myofibers
- 4:10 - 4:30PM** **Miranda Grounds**, The University of Western Australia
New insights into the pathology of dysferlin deficient muscular dystrophies
- 4:30 - 4:50PM** **Daniel Michele**, University of Michigan
Disrupted mechanosignaling in muscular dystrophy
- 4:50 - 5:10PM** **Laszlo Nagy**, Sanford Burnham Prebys Medical Discovery Institute
PPARgamma Regulated GDF3 and GDF15: A Unique Role in Macrophage Mediated Muscle Regeneration
- 5:10 - 5:30PM** **Yasuyuki Mitani**, Cincinnati Children's Hospital Medical Center
Myomaker-Mediated Heterologous Fusion as a Novel Gene Delivery Vehicle for Muscle Diseases
- 7:00 - 9:00PM** **BANQUET DINNER: Lafayette's Music Room (Additional registration is required)**

Saturday, July 2, 2016

7:15 - 8:15AM Breakfast will be served in Atrium C

Session VII: Novel Approaches

Chair: Miranda Grounds

- 8:00 - 8:20AM **Jeffrey Chamberlain**, University of Washington
Relative efficacy of dystrophin production in mdx mice using AAV-microdystrophin vs CRISPR/Cas9
- 8:20 - 8:40AM **April Pyle**, University of California, Los Angeles
Development of a CRISPR/Cas9 gene editing and skeletal muscle progenitor cell therapeutic platform using DMD-human induced pluripotent stem cells
- 8:40 - 9:00AM **Kevin Campbell**, University of Iowa and Howard Hughes Medical Institute
Structural Basis of Laminin Binding to Dystroglycan
- 9:00 - 9:20AM **Chengzu Long**, University of Texas Southwestern Medical Center
Permanent Correction of Diverse Duchenne Muscular Dystrophy Mutations by Gene Editing
- 9:20 - 9:40AM **Elisabeth Barton**, University of Florida
Development of Orally Bioavailable Therapeutics by Chloroplast Expression Counters Muscle Weakness in DMD
- 9:40 - 10:10AM **COFFEE BREAK**

Session VIII: New & Novel

Chair: Michael Lawlor

- 10:10 - 10:30AM **Vandana Gupta**, Brigham and Woman's Hospital
Identification of novel biological pathways and therapeutic development in nemaline myopathy
- 10:30 - 10:50AM **Kathryn Wagner**, Kennedy Krieger Institute and Johns Hopkins School of Medicine
Development of antisense oligonucleotide therapeutics for Facioscapulohumeral muscular dystrophy
- 10:50 - 11:10AM **Eiji Wada**, The University of Tokyo
Preventing dystrophic phenotypes of mdx mice by sevelamer, a phosphate binding drug
- 11:10 - 11:30AM **Chady Hakim**, University of Missouri
A single intravenous injection of a novel AAV micro-dystrophin vector resulted in extended amelioration of muscle disease in the canine model of Duchenne muscular dystrophy
- 11:30 - Noon **Closing Remarks**
- Noon **Adjourn**