



CDB SEMINAR

Speaker:

Guy Benian

< Department of Pathology and Cell Biology, Emory University >

Title: **“*C. elegans*: a wonderful system for studying the assembly and maintenance of myofibrils”**

Date: **Monday, November 22**

Time: **12:00 P.M. - 13:00 P.M.**

Place: **7F Conference Room of Building A**

Summary:

We would like to understand the mechanisms by which the muscle contractile apparatus (the myofibril) assembles from its components, and how this precise structure is maintained in the face of repeated muscle activity. This goal is ultimately the cornerstone for understanding many types of human muscular diseases including several types of muscular dystrophies and cardiomyopathies. A number of labs, including our own, are taking advantage of the ability to analyze mutants in *C. elegans* to obtain insights into these questions. Myofibrils contain giant polypeptides (700,000 Da—4 MDa) that consist primarily of Ig, Fn3 and one or two protein kinase domains. At varying levels of certainty, these proteins are thought to have roles in myofibril assembly and as “sensors” of muscle activity. We discovered the founding member of this family, twitchin, and more recently, UNC-89 (the human homolog is called “obscurin”) and the Ce titins, in the nematode. We are also studying two genes, *unc-98* and *unc-96*, which have similar mutant phenotypes: reduced motility and a unique structural defect in their myofibrils. UNC-98 is a 310 residue polypeptide containing 4 C2H2 Zn fingers, and it resides both in muscle focal adhesions and in muscle cell nuclei. UNC-98 interacts with UNC-97 (PINCH in mammals), a LIM domain protein required for muscle focal adhesion assembly. Like UNC-98, UNC-97::GFP localizes to muscle focal adhesions and nuclei. We hypothesize that UNC-98 and UNC-97 function in muscle focal adhesion homeostasis, in which these proteins, when localized to the adhesion sites, monitor myofibril integrity or muscle activity, and travel into the nucleus to affect expression of myofibril components. UNC-96 is a novel 418 residue protein and by 2-hybrid interacts with two conserved LIM domain proteins that also interact with UNC-97. Much of our work on UNC-98, UNC-97 and UNC-96 has been done in collaboration with Hiroshi Qadota.

Host: **Hiroshi Qadota** <Developmental Genomics, CDB>

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