in this issue >>>

Why We Do What We Do

Community Focus Symposium

CNG Faculty & Research Labs

Clinical Connections

Ask The Experts

July 2016

The Center for NeuroGenetics, University of Florida

*in*focus

Come hear what we are doing...

Join us at the Center for NeuroGenetics for the

First Annual Community Focus Symposium

July 22nd, 2016

See page 2 for more details

The UF Center for NeuroGenetics

Why we do what we do…

The Center for NeuroGenetics (CNG) uses molecular, genetic and clinical research to define the causes of neurodegenerative disease and to develop effective treatment strategies.

Genetic disorders that affect the nervous and muscular systems are responsible for a large number of devastating diseases including amyotrophic lateral sclerosis (ALS), myotonic dystrophy (DM), Huntington disease (HD) and the spinocerebellar ataxias (SCAs).

Each of these diseases progresses over a period of years and results in insidious decline and ultimately death. Although there has been a significant effort to understand and treat these disorders, progress has been slow. A major reason for the limited advancement in our understanding and treatment of these disorders is that we have not developed sufficiently integrated and multidisciplinary approaches to understand the causes and common pathways of these diseases.

Cutting edge sequencing technology in the CNG

The goal of the Center for NeuroGenetics is to advance our basic understanding of these disorders so we can develop rational therapeutic strategies for patients. Key aspects of our approach are to partner with affected families to identify novel disease genes and to link these patients with scientists working to understand these diseases using both clinical and basic science approaches.

Community Focus Symposium

July 22nd, 2016
Cancer Genetics Research Complex
University of Florida

We are holding our first Annual Center for NeuroGenetics Community Focus Symposium on July 22nd at the University of Florida. The purpose of this Symposium is to highlight for the community what we are learning and the interdisciplinary basic and clinical research efforts among Center for NeuroGenetics faculty and students across campus.

Our tentative schedule for this meeting includes an overview of CNG research efforts, CNG faculty presentations, and short talks and poster presentations by Postdoctoral Fellows, Graduate students and a group of Undergraduate Summer Research Students that are being funded through a new philanthropically supported scholarship effort.

We are inviting people from the community that have previously participated in or are interested in our efforts to fight neurological and neuromuscular disease.

Come meet our team of interdisciplinary scientists who are working in the various research laboratories.

For more details and to register to attend, please visit the events page on our website at: www.neurogenetics.med.ufl.edu.

Tentative Agenda
Community Focus Symposium
July 22nd 2016, 10am—2pm

Overview of the CNG Vision
Dr. Laura Ranum

Talks by CNG Faculty
Dr. Andy Berglund
Dr. Eric Wang
Dr. Maurice Swanson
Dr. S.H. Subramony

Short talks by CNG Graduate Students and Post-doctoral Fellows

CNG Scholarship undergraduate talks

Poster session and reception

CNG Summer Scholarship Program

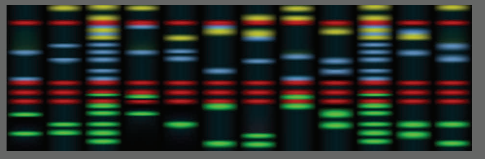
We are pleased to announce a new undergraduate Scholarship program at the CNG this summer supported through donations to the CNG.

We are looking to expand this program to include support for graduate students and post-doctoral fellows working within the CNG to further cultivate the next generation of scientific researchers.

The following undergraduate students were awarded a $2500 scholarship and given a research project within the various research labs in the CNG:

Zacharias Anastasiadis, Faaiq Aslam, John Leatherman, Andrea Murciano, Quinn Silverglate, Daniela Valero & Lainey Williams.

These students will be giving short talks and presenting posters during the Community Focus Symposium to highlight their research projects. Make sure to stop by and see the exciting science they are working on this summer.



Laura Ranum, Ph.D.

Director of the CNG. A leading expert in the field of Human Genetics with a long-term interest and track record in gene discovery and the generation of mouse models to understand the molecular mechanisms of neurodegenerative disorders.

Scientific Contributions

Dr. Ranum began her research career in human molecular genetics in 1989 at the University of Minnesota and is currently the Founding Director of the Center for NeuroGenetics and Professor of Molecular Genetics and Microbiology at the University of Florida. Over the past 25 years her laboratory has identified the mutations for a number of neurological disorders including spinocerebellar ataxia types 5 and 8 (SCA5, SCA8), and myotonic dystrophy type 2 (DM2). Her laboratory has developed and uses mouse models to understand how these and other mutations cause disease. Most recently, the Ranum lab created a mouse model of the C9orf72 ALS/dementia mutation that has generated wide interest in the scientific community studying ALS.

A common feature of several of these diseases is that they are caused by genetic mutations in which letters of the genetic code (e.g. CAG or CTG or CCTG) are repeated too many times. Over the years, work on SCA8 in the Ranum lab has led to two discoveries that have changed our understanding of how these microsatellite expansion mutations are expressed. First, they demonstrated that expansion mutations can be expressed in two directions. This means there are often two genes to worry about instead of one (Moseley et al., 2006). More recently, they discovered that a cellular traffic light that scientists thought provided a critical signal required for cells to make proteins does not apply to expansion mutations. These mutations cause the protein-making machinery of the cell to run molecular "red lights," producing up to six unexpected proteins that can accumulate in the brains of patients. The technical name for these proteins is Repeat-Associated Non-ATG, or RAN, proteins (Zu et al., 2011). These discoveries have taught us basic lessons about how genes work, and have paved the way for similar discoveries in other diseases. Bidirectional gene expression and RAN proteins are now thought to play a role in more common diseases, including ALS and dementia.

Research in the Ranum Lab

Current research in the Ranum lab focuses on the role of Repeat Associated Non-ATG (RAN) translation, RNA gain of function and protein gain of function in repeat expansion disorders including amyotrophic lateral sclerosis (ALS), spinocerebellar ataxia (SCA) types 5 and 8, myotonic dystrophy (DM) types 1 and 2 and Huntington's disease (HD). We are investigating the mechanism by which RAN translation occurs in these diseases and the toxic effects of RAN proteins on the brain and other organs. We have shown that RAN proteins accumulate in brain tissue from patients diagnosed with SCA8, ALS and Huntington's disease and are using mouse models of these diseases to better understand the impact of these proteins and to develop therapeutic strategies. Additionally, the Ranum laboratory continues to search for novel human disease genes. We are using high-throughput sequencing strategies to look for single-gene mutations that cause novel forms of ataxia, ALS and neuropsychiatric diseases. Because RAN translation has now been shown to occur across multiple diseases, and greater than 30 diseases are caused by repeat expansion mutations, these studies are likely to contribute to the understanding and development of urgently needed therapies for a large category of diseases. Scientific breakthroughs made in the Ranum laboratory over the years have depended on partnerships with talented scientific colleagues and students and with members of the community that have participated in our research studies. Although there is much work that remains, scientific advances have dramatically increased opportunities for drug development and clinical trials. The goal of the Ranum laboratory and the Center for NeuroGenetics is to perform synergistic cutting edge research that will lead to improvements in diagnosis and treatments for neurological and neuromuscular disease.

Select Publications

Liu, et al. (2016) C9orf72 Mouse Model with Motor Deficits and Neurodegenerative Features of ALS/FTD. *Neuron, 90:521-534*

Bañez-Coronel, et al. (2015) RAN translation in Huntington's Disease. *Neuron,* 88:667:677.

Cleary J.D., L.P.W. Ranum. (2014) Repeat associated non-ATG (RAN) translation: new starts in microsatellite expansion disorders. Curr Opin Genet Dev.

Armbrust, et al. (2014) mGluR1α mislocalization and LTP deficits in a mouse model of spinocerebellar ataxia type 5. J. Neuroscience 34(30): 9891-9904.

Zu, et al. (2013) RAN proteins and RNA foci from antisense transcripts in C9ORF72 ALS and frontotemporal dementia. Proc Natl Acad Sci U S A. 110:E4968-77. 1315438110.

Zu, et al. (2011) Non-ATG initiated translation directed by microsatellite expansions. *Proc. Natl. Acad. Sci.* 108:260-265.

C.M. Chamberlain and L.P.W. Ranum (2012) Mouse model of muscleblind-like 1 overexpression: skeletal muscle effects and therapeutic promise. Hum. Molec. Genet. 21:4645-54.

Moseley, et al.(2006) Bidirectional expression of CUG and CAG expansion transcripts and intranuclear polyglutamine inclusions in spinocerebellar ataxia type 8. *Nature Genetics* 38:758-69.

Ikeda, et al. (2006) Spectrin mutations cause spinocerebellar ataxia type 5. *Nature Genetics* 38:184-90.

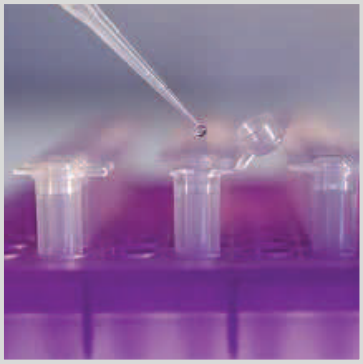
Liquori, et al. (2001) Myotonic dystrophy type 2 caused by CCTG expansion in intron 1 of ZNF9. *Science 293:864-867.*

Koob, et al. (1999) An untranslated CTG expansion causes a novel form of spinocerebellar ataxia (SCA8) *Nature Genetics 21:379-384*

Maurice Swanson, Ph.D.

Co-Director of the CNG. A leading expert in the field of neurological and neuromuscular disease. His current research focus is RNA-mediated disease mechanisms, particularly in the neuromuscular disease myotonic dystrophy (DM).

Scientific Contributions



My early studies on RNA binding proteins involved in RNA processing, including members of the hnRNP family, led to the discovery of several protein motifs (*e.g.*, RRM), which showed sequence-dependent interactions with target RNA sequences. This observation led to an interest in microsatellites since they are tandem repeats. Following the discovery of microsatellite expansion mutations as the cause of a number of neurological diseases, including fragile X (FRAXA) and myotonic dystrophy (DM), I became interested in the molecular basis of DM because the expansion mutation is located in the 3' untranslated region (3' UTR) of the *DMPK* gene and yet the inheritance pattern is autosomal dominant.

We proposed the RNA-mediated pathogenesis model for DM whereby disease-associated mutations are transcribed into expansion RNAs that are pathogenic because they sequester cellular factors required for normal cell functions. To provide evidence for this model, we identified and characterized the first CUG-binding protein, CUGBP1/CELF1, but subsequent studies failed to confirm that CELF1 was a sequestered factor. This led us to develop a repeat-dependent crosslinking assay that resulted in the discovery of the muscleblind-like (MBNL) protein family and subsequent confirmation that MBNL loss-of-function is a major pathogenic event in DM. Another major effort of our research group has been to understand how proteins interact with RNA structures and how these interactions lead to the formation of nuclear RNA foci. Additionally, we have clarified the functional differences between MBNL family members (MBNL1, MBNL2 and MBNL3) in RNA processing in different tissues and these studies have resulted in the current model that DM is a MBNL compound loss-of-function disease. Our analysis has provided an experimental basis to examine the roles of other microsatellite expansions in neurological disease, including *C9orf72* ALS/FTD.

Research in the Swanson Lab

Dr. Swanson's research has focused on the fundamental mechanisms involved in pre-mRNA processing, including splicing and polyadenylation. A major objective has been to address the question of how RNA processing is regulated during embryonic, fetal and postnatal development and how this regulation is disrupted in neurological disease, particularly in microsatellite expansion disorders.

Our primary experimental system is the mouse and we have generated a number of knockout, knockin and transgenic lines to investigate the roles of specific RNA-binding proteins in disease pathogenesis.

As the PI or Co-PI on a number of NIH-funded grants, Dr. Swanson has been responsible for administering these projects and also developing collaborations with a wide range of investigators to generate results that have had a significant impact on our understanding of RNA processing in mammalian development and disease.

Select Publications

Goodwin, et al., (2014) RNA-binding protein mis-regulation in microsatellite expansion disorders. *Adv. Exp Biol. Med. 825:353-388*

Mohan, et al. (2014) RNA-protein interactions in unstable microsatellite diseases. *Brain Res. doi: 10.1016/j,brainres.2014.03.039.* PMID: 24709120.

Batra, et al. (2014) Loss of MBNL leads to disruption of developmentally regulated alternative polyadenylation in RNA-mediated disease. *Mol. Cell 56:311-322.*

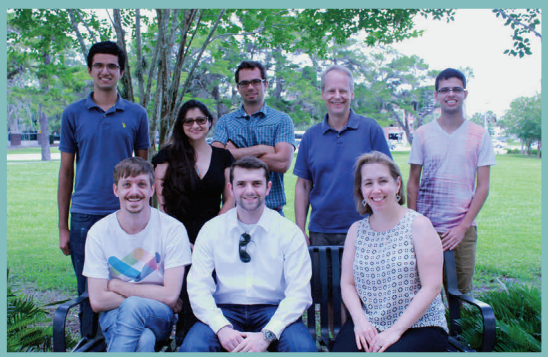
Swanson, et al. (2015) Rectifying RNA splicing errors in hereditary neurodegenerative disease. *Proc. Natl. Acad. Sci. USA 112:2637-2638.*

Batra, et al. (2015) Global insights into alternative polyadenylation regulation. *RNA Biol. 12:597-602*

Goodwin, et al (2015) MBNL sequestration by toxic RNAs and RNA mis-processing in the myotonic dystrophy brain. *Cell Rep. 12:1159-1168.*

Scotti, M., and M.S. Swanson. 2016. RNA mis-splicing in disease. *Nat Rev. Genet. 17:19-32.*

Freyermuth, et al. (2016) Splicing mis-regulation of SCN5A contributes to cardiac-conduction delay and heart arrhythmia in myotonic dystrophy. *Nat. Commun., 7:11067. doi: 10.1038/ncomms11067.*



Andy Berglund, Ph.D.

Joined the CNG in the Summer 2015 bringing part of his research group from the University of Oregon with him to UF. His current focus is on understanding the disease mechanisms of DM and other neuromuscular diseases and using small molecules to target the toxic RNAs that cause these diseases.

Scientific Contributions

Dr. Berglund began studying biochemistry in 1990 with a focus on the structures that RNA can adopt and their role in biology. His interests expanded to determining the mechanisms through which RNA binding proteins recognize RNA motifs in pre-mRNA splicing. As a graduate student he was the first to show that proteins conserved from yeast to humans specifically recognize a RNA motif that is essential for the recognition and removal of introns in pre-mRNA splicing. In his own laboratory, he and his group began studying the molecular mechanisms of myotonic dystrophy. This lead to his laboratory solving the first crystal structure of CUG repeats. They have solved additional structures of CUG repeats leading to a better understanding of the dynamics of the repeats and insights into the toxicity of the repeats. One of the mechanisms through which the CUG and CCUG repeats for myotonic dystrophy type 2 (DM2) are toxic is the sequestration of the muscleblind-like (MBNL) family of RNA binding proteins.

The sequestration of MBNL proteins leads to many changes in splicing, which are implicated in causing the symptoms in DM. His laboratory, along with several other groups in the field, have identified some of the mechanisms through which the MBNL family of proteins regulate splicing providing a better framework for understanding the mis-splicing in myotonic dystrophy. For many years the group has investigated using small molecules to target the toxic CUG and CCUG repeats of DM. These efforts have lead to the identification of molecules that rescue the mis-splicing in DM1 cell and mouse models. Recently the group has shown that targeting the production of the toxic RNA shows promise as a potential approach to identify lead compounds for developing therapeutics.

Research in the Berglund Lab

The Berglund lab continues to focus on myotonic dystrophy with the goal of translating basic science into clinical research using a combination of biochemical, cellular and genomic approaches. The lab is beginning to expand their research efforts into other neuromuscular diseases caused by microsatellite expansions to determine similarities and differences in the mechanisms across these diseases. These studies are important to build the necessary foundation of basic understanding that can be used to develop therapeutic strategies for DM, ataxia and ALS.

A few of our current projects are briefly described. The characterization of many mis-splicing events from DM1 patients is leading to predications on which splicing events are the best biomarkers for therapeutic studies. We plan to expand this approach to DM2. We are developing novel synthetic MBNL1 proteins that have altered activities providing insight into how this protein recognizes RNA and regulates splicing. A synthetic MBNL1 with improved activity could potentially be used in a therapeutic approach.

We are developing approaches to screen libraries of small molecules and mining the scientific literature to identify compounds that can be used to inhibit the production of toxic RNAs. Lead compounds that show promise inhibiting the production of the toxic RNAs will be studied to understand the mechanisms through which they function to inform the development of molecules with improved activity.

Select Publications

Siboni et al., (2015) Actinomycin D Specifically Reduces Expanded CUG Repeat RNA in Myotonic Dystrophy Models. *Cell Rep.* 13(11):2386-94.

Siboni et al., (2015) Biological Efficacy and Toxicity of Diamidines in Myotonic Dystrophy Type 1 Models. *J Med Chem*. 58(15):5770-80.

deLorimier et al., (2014) Modifications to toxic CUG RNAs induce structural stability, rescue mis-splicing in a myotonic dystrophy cell model and reduce toxicity in a myotonic dystrophy zebrafish model. *Nucleic Acids Res.* 42(20):12768-78.

Coonrod et al., (2013) Reducing Levels of Toxic RNA with Small Molecules. *ACS Chem Biol.* 8(11):2528-37.

Eric Wang, Ph.D.

Joined the CNG in Summer 2015

A leading expert in myotonic dystrophy and RNA processing, with interests in RNA localization, computational biology, and single molecule imaging approaches

Scientific Contributions

Eric has always been interested in understanding how biological systems function, but in part entered this field and joined the team at UF because *he has family members affected by myotonic dystrophy*.

He is personally motivated to better understand DM and related diseases, and to find treatments. Eric received his PhD from Harvard-MIT Division of Health Sciences and Technology, mentors Christopher Burge and David Housman. There, he trained in computational biology, as well as learned about diseases such as DM, Huntington's disease, and ALS.

Eric has published key work characterizing the use of deep sequencing technologies to study RNA species across the entire transcriptome, and found that over 95% of human multi-exonic genes are alternatively spliced, the majority in a tissue-regulated manner. He later applied these technologies to studying functions of the Muscleblind proteins, which play a key role in DM, uncovering an unanticipated global role for these proteins in regulating the localization of RNAs to specific subcellular compartments. In more recent work, he has shown that the MBNL and CELF proteins, both implicated in DM, antagonize each other's functions in the nucleus (splicing) and cytoplasm (RNA localization and stability).

In 2013, Eric received an NIH Director's Early Independence Award, which allowed him to launch his lab at MIT. In 2015, he decided to move his lab to the Center for Neurogenetics, in order to work more closely with like-minded individuals focused on understanding microsatellite repeat diseases. He looks forward to helping to build a cohesive team capable of achieving more by working together rather than independently.

Research in the Wang Lab

Our lab is focused on three main areas 1) studying the pathogenesis of microsatellite repeat diseases, in particular myotonic dystrophy, 2) studying the basics of how RNA is processed and localized in cells in tissues, and 3) combining insights made in both of those areas to develop treatments for people with these diseases.

We use a number of traditional molecular and cell biological approaches, as well as cutting edge sequencing and computational approaches. A critical tool for us is **deep sequencing** which allows us to obtain millions of data points in a single experiment with a low cost and time investment. This tool has allowed us to gain a comprehensive view of how RNA species are perturbed in DM and other diseases.

While we have applied this approach to studying these changes in muscle and heart of DM patients, we are beginning to study the central nervous system, and trying to connect RNA changes to important symptoms such as sleepiness, fatigue, learning & memory, and executive functioning.

Our studies of DM pathogenesis and RNA regulation are in part driven by a desire to find treatments for DM and other related diseases. We work with diverse partners in both academia and industry, and are taking a number of approaches to develop therapeutics that will hopefully one day be provided to patients.

Select Publications

Wang et al., (2015) Antagonistic Regulation of mRNA Expression and Splicing by CELF and MBNL Proteins. *Genome Res*.

Katz et al., (2015) Quantitative visualization of alternative exon expression from RNA-seq data. *Bioinformatics*.

Wang et al., (2012) Transcriptome-wide Regulation of Pre-mRNA Splicing and mRNA Localization by Muscleblind Proteins. Cell, 150 (4): 710-24, 2012.

From Bench to Bedside

UF has dedicated adult and pediatric Ataxia, ALS, Muscular Dystrophy, and Huntington Disease clinics. Drs. S.H. Subramony, James Wymer, Guangbin Xia, Nikolas McFarland, and their colleagues, provide expert evaluation for patients and families with genetic neuromuscular and neurological diseases. A multi-disciplinary team including physical, occupational, and speech therapists along with consulting cardiologists and pulmonologists participate in the care as needed. In addition to this ongoing care, one of the major goals of the Center for NeuroGenetics is to bridge the gap between research in the labs and clinical care of patients. The CNG also works very closely with Dr. Anthony Yachnis at UF Health in the Department of Pathology for the analysis of various tissues.

Patients and families are offered opportunities to participate in research that may lead to better diagnosis and treatment strategies, including new gene discovery, studies of imaging and biochemical markers of disease, collection of natural history data that will improve "trial readiness" and clinical trials of novel medications as they become available.

S. H. Subramony, M.D.

Dr. S. H. Subramony was involved in the identification and characterization of many families with spinocerebellar ataxias for gene discoveries such as SCA 1, SCA 3 and SCA 6 and continues this effort in additional families.

He has also been involved in identifying novel mutations in some muscle diseases such as central core disease and Bethlem myopathy. He continues to have an active research role in natural history studies of spinocerebellar ataxias and Friedreich ataxia, and has initiated many other clinical projects in these diseases including clinical trials, imaging research and motor physiology studies.

Dr. Subramony is involved in ongoing research in muscular dystrophies such as myotonic dystrophy and Duchenne muscular dystrophy and actively participates in ongoing clinical trials. He is an active collaborator with the Powell gene therapy center at UF as well as with many members of the Center for Neurogenetics.

Dr. Subramony is a member of many national clinical research networks including the Friedreich Ataxia Research network, the Myotonic Dystrophy clinical research network and the Consortium for Spinocerebellar Ataxias. His long term goals are to bring therapeutic and preventive strategies to these rare Neurogenetic disorders. Current clinical studies include medication trials in myotonic dystrophy, Friedreich ataxia, Charcot Marie Tooth disease, natural history studies in Friedreich ataxia, spinocerebellar ataxias and myotonic dystrophy and imaging and motor physiology research in spinocerebellar ataxias.

Guangbin Xia, M.D., Ph.D.

Dr. Xia is an assistant professor in the Department of Neurology of the University of Florida holding a joint appointment as assistant professor and graduate faculty in the Department of Neuroscience.

Dr. Xia received his MD degree in Shanghai, China, his Ph. D. degree in Tokyo, Japan and completed his postdoctoral training at the University of Southern California. He is board-certified in both Neurology and Neuromuscular Medicine. Dr. Xia holds hospital privileges for performing EMG/NCS, muscle biopsy and skin biopsy. His clinical experience includes management of patients with motor neuron diseases, neuropathies, myasthenia gravis, myopathy/muscular dystrophies and spinocerebellar ataxias.

Dr. Xia's research interest is in therapeutic development for neurogenetic degenerative diseases, mainly nucleotide repeat expansion-mediated neurodegenerative disorders. His lab is focusing on using disease-specific and patient-specific induced pluripotent stem (iPS) cells for the development of autologous stem cell transplantation for advanced neurogenic degenerative disorders. He has established iPS cells for Myotonic Dystrophy type 1 and type 2, spinocerebellar ataxias types 2, and 3 and ALS/C9orf72.

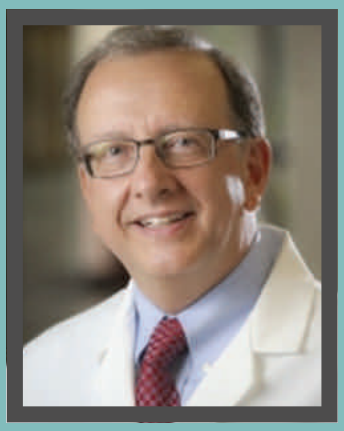
His recent work involves the correction of the mutations in these iPS cells. It is hoped that future research will allow these cells to be used for transplantation. Dr. Xia is also developing *in vivo* genome therapy to correct the mutation at the early stage of the disease to prevent the onset and progression of the disease. This is challenging work but it may, in the future, lead to a cure for these daunting neurogenetic degenerative diseases.

James Wymer, M.D., Ph.D.

Dr. James Wymer recently joined the University of Florida as a professor in neurology and the Director of the Neuromuscular Division. He is a practicing neurologist specializing in the diagnosis and management of neuromuscular diseases including amyotrophic lateral sclerosis (ALS), also know as Lou Gehrig's disease, muscles diseases and peripheral neuropathies.

Dr. Wymer received his M.D. and Ph.D. at the University Of Maryland School Of Medicine and completed his Internship and Residency in the Neuromuscular Disease Center at the Strong Memorial Hospital at the University Of Rochester Medical Center in Rochester NY. Dr. Wymer has extensive experience in clinical research and has been the principal investigator in numerous clinical trials including studies of ALS, diabetic neuropathy, multiple sclerosis, migraine headaches and epilepsy. He is a fellow of the American Academy of Neurology (AAN) and the American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM). He is a member of several national consortiums to research neuropathic pain and ALS.

Dr. Wymer will be establishing a specialized ALS clinic here at UF Health and we are excited to welcome him to the University of Florida and as a collaborator of the Center for NeuroGenetics.



Anthony T. Yachnis, M.D., M.S.

Dr. Tony Yachnis has been a faculty member at the University Of Florida College Of Medicine for more than two decades and is the Neuropathology Section Chief and Director of the Pathology Training Program at UF Health Department of Pathology. He is certified in anatomic pathology and neuropathology by the American Board of Pathology.

Dr. Yachnis has authored more than 100 publications, including journal articles, book chapters and two books. He has given numerous invited talks and has won national and local awards for research and teaching, including the *Horatio T. Enterline Award* in surgical pathology and the *Moore and Rubinstein Awards for the American Association of Neuropathologists*.

Prior to his tenure at the UF College of Medicine, Dr. Yachnis completed pathology residency and a surgical pathology fellowship at the University of Pennsylvania from 1986 to 1991. He then received specialized training in pediatric neuropathology at Philadelphia Children's Hospital in 1993.

Dr. Yachnis works closely with the Center for NeuroGenetics in the assessment of donated tissue and provides his expertise in neuropathology to the histological findings carried out by

Nikolaus McFarland, M.D.,Ph.D.

Dr. Nikolaus McFarland joined the UF Department of Neurology (and Neuroscience) and the Center for Movement Disorders and Neurorestoration as an Assistant Professor and holds the Wright/Falls/Simmons Professorship in PSP/Atypical Parkinson's. He completed medical and graduate training in the MD/PhD program at the University of Rochester School of Medicine & Dentistry, where he received a merit award for outstanding graduate research in thalamic and basal ganglia anatomy. Afterwards he went to the University of Virginia for internship and residency training in neurology and then to the Massachusetts General Hospital to pursue fellowship training in Movement Disorders and research in Parkinson disease and related disorders at the MassGeneral Institute for Neurodegenerative Disease (MIND).

Dr. McFarland oversees the UF Huntington Disease Clinic which has been designated by the Huntington's disease Society of America (HDSA) as a Center of Excellence, one of 39 centers across the country. Located at the UF Health Center for Movement Disorders & Neurorestoration the HD Clinic includes a specialized, multidisciplinary team of medical professionals and includes specialists in neurology, psychiatry, neuropsychology, a neurogenetics counselor, physical and occupational therapy, speech and swallowing therapy, and social work. The HD clinic works closely with multiple researchers, including those at the Center for NeuroGenetics, and is committed to providing patients with Huntington's disease the best interdisciplinary medical care and access to the latest clinical research and experimental therapeutics. Dr. McFarland is collaborating with Dr. Ranum and her laboratory in the Center for NeuroGenetics to undertand the role and impact of RAN translation in HD.

Important Contact Information

University of Florida
Center for NeuroGenetics

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2033 Mowry Road
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352-273-6177 Tel
352-294-8074 Fax

UF Health Center for Movement Disorders and Neurorestoration
For appointments call 352-294-5400

3450 Hull Rd, 4th Floor
Gainesville, FL 32607
- Ataxia Clinic
- Huntington's Disease Clinic
- General Movement Disorder Clinic

UF Health Neurology – Medical Plaza
For appointments call 352-265-8408

2000 SW Archer Rd, 3rd Floor
Gainesville, FL 32608
- Muscular Dystrophy Clinic
- ALS Clinic

UFHealth
UNIVERSITY OF FLORIDA HEALTH

UF UNIVERSITY of FLORIDA

Additional Patient Resources

Map of the CNG and associated UF Health clinics

Center for NeuroGenetics
2033 Mowry Road
Gainesville, FL 32610

Movement Disorder Clinic
3450 Hull Rd, 4th Floor
Gainesville, FL 32607

Shands Medical Plaza
2000 SW Archer Rd,
3rd Floor,
Gainesville, FL
32608

Additional Patient Resources

Support Organizations and Info:

Myotonic Dystrophy Foundation
www.myotonic.org

Muscular Dystrophy Association
www.mda.org

Marigold Foundation
www.marigoldfoundation.org

National Ataxia Foundation
www.ataxia.org

ALS Association
www.alsa.org

CHDI Foundation
www.Chdifoundation.org

Huntington's Disease Society of America
www.hdsa.org

NIH—Clinical Trials Info
https://www.nih.gov/health-information/nih-clinical-research-trials-you

Patient Registries:

National Registry of Myotonic Dystrophy & FSHD
www.urmc.rochester.edu/neurology/national-registry.aspx

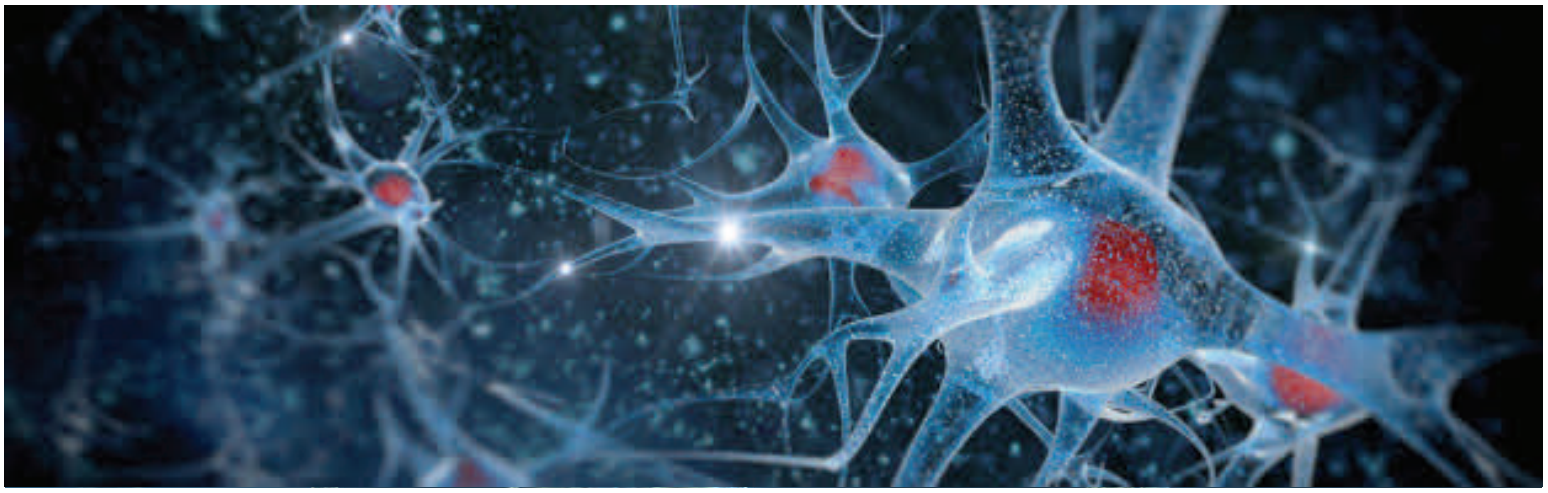
Friedreich's Ataxia Research Alliance Registry
www.curefa.org/patient-registry

The Myotonic Dystrophy Family Registry
https://myotonicregistry.patientcrossroads.org/

CoRDS Registry for the National Ataxia Foundation
https://cordsconnect.sanfordresearch.org/BayaPES/sf/screeningForm?id=SFSFL#

National ALS Registry - The ALS Association
*www.**als**a.org/**als**-care/**als-registry**/*

The Fragile X Research Registry
https://www.fragilexregistry.org/?gclid=CKLwzdzOpKkCFcW5Kgodlh8cwQ/



*final*thoughts...

Our goal is to advance our understanding of the causes of neurogenetic disease and develop opportunities for therapeutic intervention.

To accomplish this we are using an integrated approach to understand the molecular mechanisms and common cellular pathways of neurological and neuromuscular disease.

The Center combines valuable clinical and patient support, newly available tools for gene discovery and laboratory models that allow us to study of the effects of these mutations on the basic biology and function of neurons in the brain.

Upcoming Center Events

- *Community Focus Symposium*
  July 22, 2016
  (see page 2 for details)
- *3rd Annual Brainstorm Symposium*
  Dec. 12-13, 2016

Want to help?

If you would like to join us in the fight to combat neurogenetic disorders including muscular dystrophy, ataxia, amyotrophic lateral sclerosis (ALS) and neuropsychiatric disorders please consider participating in one of our research studies and/or a financial gift.

Donations to support our mission can be made online via our secure website: https://www.uff.ufl.edu/OnlineGiving/FundDetail.asp?FundCode=017933

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