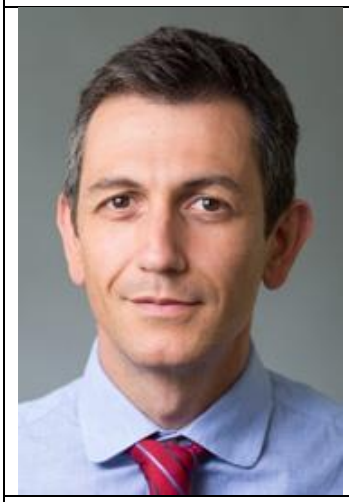


Name: Konstantinos Linos

Institute: Geisel School of Medicine at Dartmouth, Dartmouth-Hitchcock Medical Center

Description of research training/ clinical externship: 12-months basic science training

Topic: Anatomic Pathology Department

Description of basic science project:

A variety of projects can be accommodated in the area of molecular pathology and its correlation with morphologic findings.

Name: Christos Hatzis

Institute: Yale University School of Medicine/Yale Cancer Center

Description of research training/ clinical externship: 12-months basic science training (Medicine/Medical Oncology)

Topic: Identification of resistant subpopulations in triple negative breast cancer

Description of basic science project:

Breast cancer is one of the most common causes of cancer death in women in the US, with over 246,000 new cases estimated in 2016, and over 40,000 deaths by the National Cancer Institute. Extensive genotypic profiling and phenotypic profiling has revealed several molecular subtypes of breast cancer, each with characteristic patterns of prognosis and drug sensitivity. Molecularly targeted therapies are available for estrogen receptor-positive breast cancers and for HER2-positive breast cancers In contrast, there are no targeted agents that reliably control triple negative breast cancer lacking estrogen receptor, progesterone receptor, and high HER2. Triple negative breast cancer arises in younger women, is aggressive, and is difficult to treat effectively and accounts for approximately 15% of the general US population. This research project will use new single cell analytical methods to enumerate the major cellular subpopulations comprising the tumor cell clone in triple negative breast cancer, and to understand how they interconvert and contribute to tumor fitness. It is expected that new subpopulations will be identified. The RNA and protein markers that identify them will be used to further subset triple negative breast cancers that may lead to therapeutic approaches better tailored to these tumors. Furthermore, these new subpopulations, and the regulatory circuits that govern all of the triple negative breast cancer cell populations, will be explored as therapeutic targets based on their functions. This analysis will then potentially improve therapies for all patients with triple negative breast cancer. The project could involve several labs of collaborators at Yale.

Name: Charalambos Kaittanis

Institute: Harvard Medical School / Mass General

Description of research training/ clinical externship: 12-months basic science training

Topic: Molecular imaging in oncology and inflammation

Description of basic science project

The scope of this project is to develop translational imaging agents for solid tumors and immune system effectors. In addition to chemistry and PET/MR imaging, the work intends to delineate molecular and cellular mechanisms, using in vitro and in vivo models. Treatment tailoring based on imaging results will also be evaluated.

Name: Katerina Akassoglou

Institute: University of California, San Francisco

Description of research training/ clinical externship: 12-months basic science training

Topic: Neuroimmunology

Description of basic science project:

Research in my laboratory focuses on the investigation of neurovascular interactions in neurologic diseases, and in particular the functional role of blood-brain barrier (BBB) disruption in CNS autoimmunity, trauma, and neurodegeneration. Our aim is to understand the mechanisms that control the communication between the brain, immune and vascular systems with the ultimate goal to design novel therapies for neurologic diseases. We have developed particularly strong experience in advanced imaging technologies, including super-resolution microscopy of glia and in vivo imaging of the neurovascular interface in the living mouse brain and spinal cord using two-photon microscopy. We integrate animal modeling, histopathology, tissue culture and biochemistry techniques, as a multifaceted experimental approach to address the biological complexity of neurologic diseases, dissect the roles of individual genes and pharmacologic treatments and correlate clinical phenotypes with cellular and molecular mechanisms of disease. In addition, I have established long-standing collaborations with the UCSF Multiple Sclerosis and Small Molecule Discovery Centers, where I am actively involved in pre-clinical translational research aiming to discover novel biologics, small molecules, and biomarkers.

Name: Eleni Liapi

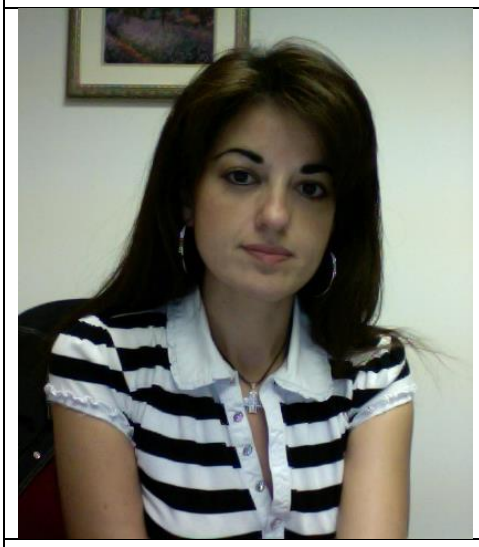
Institute: Johns Hopkins University School of Medicine

Description of research training/ clinical externship: 12-months basic science training

Topic: Magnetic hyperthermia for treatment of unresectable liver cancer

Description of basic science project:

This project spans from basic cancer cell cultures to large animal studies, exploring the effects of magnetic hyperthermia for treatment of unresectable liver cancer. One aspect of this project involves the effect of heat shock proteins 70 and 90 on immune system modulation and thermotolerance. Another aspect of this project involves imaging with US, CT and MRI, as well as simulations, for evaluating tumor perfusion changes in relation to hyperthermia.



Name: Aikaterini Kontrogianni-Konstantopoulos

Institute: University of Maryland School of Medicine

Description of research training/ clinical externship: 12-months basic science training

Topic: Cytoskeletal regulators in health and disease

Description of basic science project:

Our research focuses on the elucidation of the roles of cytoskeletal and membrane-associated proteins as structural and signaling mediators. Using the muscle and epithelial cell as model systems, our laboratory has pioneered the molecular and functional characterization of the obscurin subfamily and its binding partner Myosin Binding Protein-C slow in health and disease. Mutations in the OBSCN gene encoding obscurins leads to diverse diseases ranging from cardiomyopathy to cancer, while mutations in the MYBPC1 gene encoding MyBP-C slow lead to severe and lethal forms of distal arthrogryposis and musculoskeletal myopathies accompanied by tremor and spinal rigidity. Our research is highly diverse involving the use of molecular & cellular biology techniques, biochemical, proteomics and biophysical approaches, examination of human biospies, and generation and physiological evaluation of animal models.

Name: Dimitrios Kapogiannis

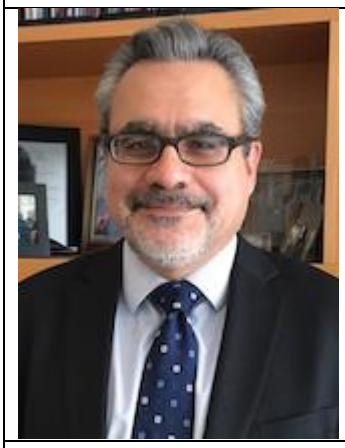
Institute: National Institute on Aging / National Institutes of Health (NIA/NIH)

Description of research training/ clinical externship: 12-months basic science training

Topic: Exosome-based biomarkers for neurological disorders

Description of basic science project:

Our Laboratory has been a pioneer in deriving exosomes enriched for neuronal origin from plasma and using them for biomarker discovery in neurological disorders. Our primary focus is on Alzheimer's disease, but we have active projects on biomarkers for Parkinson's disease, Multiple Sclerosis, and neuromuscular diseases. Future goals include deriving exosomes of heart muscle origin and using them as source of biomarkers for cardiac conditions. The fellow will be trained in a variety of laboratory techniques used to isolate exosomes and quantify biomarkers including immunoprecipitation, Western Blots and ELISA assays. The fellow will be expected to define and run her/his own biomarker discovery project based on a wide variety of existing sample-sets, identify biomarker targets, isolate exosomes, quantify target biomarkers and publish the results. Our Laboratory also conducts clinical trials in subjects with Alzheimer's disease or at normal subjects at higher risk for Alzheimer's disease. The fellow can spend 3 months assisting with subject enrollment, attend history and physical sessions, lumbar punctures, MRIs (clinical and research), and cognitive testing. This would provide a hands-on experience in all aspects of clinical research in the US and clinical experience with Alzheimer's disease.



Name: Constantinos Koumenis

Institute: Perelman School of Medicine at the Univ. of Pennsylvania

Description of research training/ clinical externship: 12-months basic science training

Topic: Development and testing of radiosensitizers/radioprotectors

Description of basic science project:

12-month position available to study the effects of a clinically used radioprotector in a novel mouse model of intestinal injury (Verginadis et al., Cancer Res, 2016). The candidate will learn and apply techniques to study the infiltration of macrophages and other immune cells into the irradiated area and examine the effects of the radioprotector on immune modulation and fibrosis. A concurrent clinical trial in the Department is underway and there is opportunity for the trainee to participate in the analysis of the data in that setting as well. Some experience with molecular biology and animal studies is helpful but not required.

Name: Nikolaos Mellios

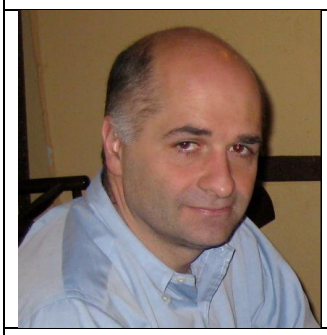
Institute: University of New Mexico School of Medicine

Description of research training/ clinical externship: 12-months basic science training

Topic: Role of circular RNAs in brain plasticity and psychiatric disorders

Description of basic science project:

Schizophrenia (SCZ) and Bipolar disorder (BD) are heterogeneous psychiatric disorders with severe socioeconomic impacts and unknown pathogenesis, despite the plethora of genomics and genetic studies focused on protein-coding genes. However, the emerging consensus is that protein-coding genes are only the tip of the iceberg of the mammalian transcriptome, given the plethora of actively transcribed non-coding RNAs (ncRNAs). Circular RNAs (circRNAs) are a novel category of ncRNAs that are derived from the back-splicing and covalent joining of exons, yet with very few exceptions lack the capacity to become translated into protein. Recent studies have suggested that circRNAs are enriched in the brain, are preferentially generated from brain plasticity-associated genes, and are abundant in dendrites and synapses. However, very little is known about the function of circRNAs in the human brain and their potential involvement in neuropsychiatric disease. We have carried out systematic profiling of circRNA expression in a large cohort of human postmortem brain samples from the orbitofrontal cortex of subjects with SCZ and BD disorder and uncovered a subset of differentially expressed circRNAs produced from genes with known links to synaptic plasticity and neuronal excitability. We validated the expression of a subset of psychiatric disease-altered circRNAs in human postmortem brain with circRNA-specific qRT-PCR and uncovered a subset of circRNAs that were also dysregulated in induced pluripotent stem cell (iPSC)-derived neuronal cultures. Ongoing experiments are using shRNA-mediated knockdown of altered in psychiatric disease circRNAs in stem cell-derived neuronal cultures to examine their role in neuronal gene expression and synaptic function. Collectively, our experiments will shed light into the unexplored role of circRNAs in brain function and disease. The trainee will have the chance to learn cutting edge ncRNA, neuroscience, and stem cell biology techniques and to participate in a very novel and ambitious project.



Name: Stelios Smirnakis

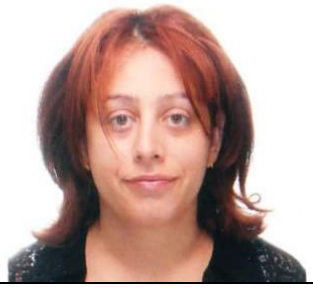
Institute: Harvard Medical School/Brigham and Women's Hospital

Description of research training/ clinical externship: 12-months basic science training

Topic: Studying Neural Circuit Malfunction in Disease States

Description of basic science project:

Several projects are available: 1) Epilepsy -- use chronic two photon imaging and ontogenetic techniques to analyze cortical circuit malfunction in vivo, in mouse models of epilepsy. Dissect how epileptiform EEG patterns correspond to cortical network activity patterns involving identified cell types. 2) Autism -- use two photon imaging and ontogenetic techniques to analyze cortical circuit malfunction during learning in the MeCP2 duplication mouse model of Autism. 3) Stroke -- using 2-photon strategies to develop a cortical micro-infarct model for studying neural repair. 4) Reorganization of the Visual System after injury -- use fMRI/MEG to study visual system organization in patients with lesions of the visual system, trying to identify imaging biomarkers that correlate with recovery and the return of visual perception.



Name: Efi Kokkotou

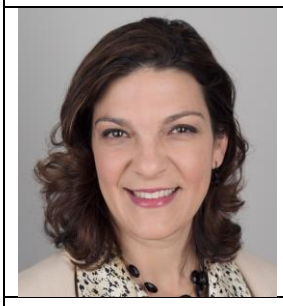
Institute: Harvard Medical School/ Beth Israel Deaconess Medical Center

Description of research training/ clinical externship: 12-months basic science training

Topic: Mucosal inflammation, experimental colitis, therapeutics

Description of basic science project:

The candidate will use approaches at a three tier level (in vitro studies, animal models, analysis of human samples) to identify novel targets for the treatment of inflammatory bowel disease Experience in basic lab techniques such as cell culture, RNA extraction and real-time PCR, immunohistochemistry and ELISA are required. Experience with FACS analysis would be a plus



Name: Maria Kontaridis

Institute: Beth Israel Deaconess Medical Center / Harvard Medical School

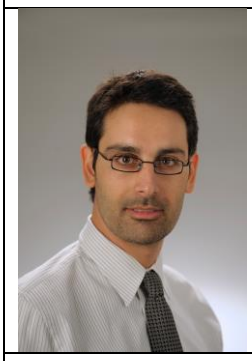
Description of research training/ clinical externship: 12-months basic science training

Topic: Cardiology and/or iPSC-derived application to study disease etiology.

Description of basic science project:

Dr. Kontaridis' research is focused on understanding the signaling pathways that mediate cellular and molecular pathogenesis of disease. The Kontaridis' research program focuses on the fundamental mechanisms associated with aberrant protein tyrosine phosphatase signaling and how mutations in these enzymes lead to congenital heart disease and end-stage heart failure, as well as autoimmunity, gastrointestinal disease and cancer. The lab uses a myriad of tools and techniques including iPS cells, in vivo mouse model systems, and molecular biology techniques. Together, these provide valuable mechanistic and functional information in understanding the differential signaling pathways that cause disease and allow for an individualized approach to therapeutic targeting. Specifically, the lab is focused on four main interests and candidate projects can focus on any of these project areas: 1) Understanding the functional mechanisms associated with SHP2 activity in the development of Systemic Lupus Erythematosus (SLE). The lab is interested in understanding how SHP2 is involved in mediating the onset/propagation of SLE. The lab's data indicate that SHP2 activity is increased in SLE and that this mediates proliferation of cytotoxic T cells, thereby causing lupus pathogenicity. Use of a novel inhibitor for SHP2 ameliorated SLE pathogenesis; increased lifespan, decreased fibrosis and inflammation in tissues, and reduced the number of skin lesions in SLE-prone mice. These data suggest that development of an SHP2 inhibitor may serve as a novel treatment for SLE. 2) Elucidation of the syndrome defects associated with Noonan (NS) and LEOPARD (LS) Syndromes. The lab is interested in investigating the cardiomyogenic and gut-associated defects associated with NS and LS, two autosomal dominant congenital RASopathy disorders principally caused by unique mutations in the protein tyrosine phosphatase SHP2. The Kontaridis group was the first to generate a mammalian mouse model system to study LS. Consequently, they identified that LS mutations led to increased AKT/mTOR activity. Moreover, they identified that the cardiac hypertrophy associated with LS could be reversed with treatment of Rapamycin. The lab is currently investigating how NS and LS mutations differentially affect lineage-specific tissue development and differentiation in mouse embryos and in iPSC-derived tissue types. 3)

Determining the phosphatase-independent functions of SHP2 in development and disease. The Kontaridis lab identified novel functional roles for SHP2 in the regulation of downstream signaling events. They were the first to identify that LS-associated SHP2 mutations, unlike the NS mutations, were loss-of-function for phosphatase activity and behaved as dominant-negatives in downstream signaling. This created a paradigm shift that altered the way phosphatases were thought to function in cellular signaling, in general, and suggested that RASopathy disorders should be distinguished by mutational analysis rather than by clinical presentation alone. Currently, the lab is investigating whether SHP2 has unique phosphatase-independent functions critical for the propagation of downstream signaling. 4) Deciphering the cardioprotective effects of the small G protein RhoA in the failing adult heart. The Kontaridis lab has discovered that RhoA, an enzyme regulated in part by SHP2, is involved in transitioning compensatory cardiac hypertrophy to heart failure. Moreover, it is involved in fibrosis, making RhoA and its downstream effectors attractive targets for therapeutic approaches in treating cardiac disease. Projects in the lab are focused on elucidating the RhoA-mediated signaling pathways involved in fibrosis and in onset of end-stage heart failure.



Name: Michail Lionakis

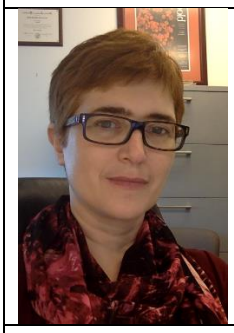
Institute: NIH

Description of research training/ clinical externship: 12-months basic science training

Topic: Fungal pathogenesis

Description of basic science project - NONE if not applicable

Since the 1990s, fungal infections have emerged as a major cause of morbidity and mortality in immunosuppressed and critically ill patients. The yeast Candida is the most common human fungal pathogen and is responsible for both invasive and mucosal infections. Neutrophils and monocytes/macrophages are critical for host defense against invasive candidiasis, the most common deep-seated human mycosis and the fourth-leading cause of nosocomial bloodstream infection in the United States. Despite administration of antifungal therapy, mortality of patients who develop invasive Candida infection exceeds 40 percent. In stark contrast to the requirement of phagocytes for defense against invasive infection, mucosal candidiasis develops 1) in patients with impaired cellular immunity such as those with AIDS (more than 90 percent of whom develop oral thrush) or inborn errors of immunity leading to chronic mucocutaneous candidiasis (CMC) and 2) in the majority of healthy women, often associated with antibiotic use (vaginal candidiasis). In all of these conditions, detailed knowledge of immunopathogenesis at the molecular and cellular levels is lacking. Our laboratory research focuses on 1) cellular and molecular factors that regulate the immune response against mucosal and invasive candidiasis in clinically relevant animal models and on 2) better understanding the genetic and immune defects that underlie enhanced susceptibility to mucocutaneous and invasive fungal infections in humans. Our goal is to develop a detailed mechanistic understanding of the molecular and cellular basis of innate and adaptive immune responses against Candida with an aim to devise novel strategies to improve the diagnosis and augment or supplement the current antifungal drug treatment against candidiasis. To this end, we utilize in vitro cell culture systems and clinically relevant mouse models of mucosal and systemicCandida infections to study host-fungal interactions by using a variety of immunological, biological, and imaging approaches.



Name: Theodosia Kalfa

Institute: Cincinnati Children's Hospital Medical Center

Description of research training/ clinical externship: 12-months basic science training

Topic: Several projects are available related to erythropoiesis or to sickle cell disease pathobiology.

Description of basic science project:

My laboratory has been studying signaling mediated by Rho GTPases (small G proteins that regulate actin mechanics and reactive oxygen species (ROS) production in cells) in red blood cell (RBC) development, morphology, and deformability. My team focuses on the signaling and cytoskeletal requirements in erythroblast cytokinesis and enucleation and the interaction of erythroblasts with the macrophage within erythroblastic islands. We have developed valuable animal models with targeted deletion of Rho GTPases in the erythroid line, with clear and distinct erythroid phenotype and novel methods using multispectral high-speed cell imaging in flow to visualize and investigate the evanescent events of erythroblast cytokinesis and enucleation, in a high enough number to produce reliable and statistically evaluable results. Our objective is to further understand the mechanism of erythroblast maturation and enucleation with the long-term goal to improve the efficiency of RBC production in vitro as a safe and readily available transfusion resource. In a second line of work, with the vision of targeted therapy in sickle-cell disease (SCD), we have been exploring the role of Rac GTPases in generation of ROS within human erythrocytes from patients with SCD. We have shown that ROS production in patients' sickle cells is mediated by NADPH oxidase (enzyme controlled by Rac) and extracellular inflammatory cytokines, revealing targets for SCD phenotype improvement. My laboratory currently investigates further the molecular pathways and consequences of increased ROS production in SCD-associated renal and cardiac pathology using mouse models of SCD with knock-out of NADPH oxidase subunits.

Name: Stavros Manolagas

Institute: University of Arkansas for Medical Sciences

Description of research training/ clinical externship: 12-months basic science training

Topic: Cellular and molecular mechanisms of osteoporosis

Description of basic science project:

Estrogen deficiency and old age are the two most critical factors for the development of osteoporosis in both women and men, but the proximal gene changes responsible for their adverse effects on bone are unknown. In previous work we have elucidated that the anti-resorptive effects of estrogens on cancellous and cortical bone in mice result from ERα signaling on cells of the myeloid and mesenchymal lineage, respectively. Further, we have obtained compelling evidence that S100A8, a calcium binding protein critical for osteoclast generation and survival, is a likely target of the direct estrogen actions on osteoclasts. On the other hand, MMP13 and SDF1 (a.k.a CXCL12) – two proteins that promote osteoclast generation and activity – are targets of the indirect effects of estrogens on resorption, mediated via cells of the mesenchymal lineage. Additionally, we have found that the increased osteoclast numbers and cortical bone loss caused by estrogen deficiency and aging are independent and mechanistically distinct. Albeit, mesenchymal/stromal cells of old mice exhibit typical features of senescence and the senescence associated secretory phenotype (SASP), including increased expression of MMP13 and SDF1. Based on these insights, we hypothesize that the protective effects of estrogens against the resorption of cancellous and cortical bone are not only mediated by distinct cell types but also via different target genes: S100A8 in the former and MMP13 and SDF1 in the latter. In the estrogen deficient state, an increase of S100A8 expression in osteoclasts is the proximal mediator of the increased resorption of cancellous bone; while an increase in MMP13 and SDF1 expression in mesenchymal/stromal cells is the proximal mediator of the increased resorption of cortical bone. MMP13 and SDF1 may also play a role in the age-dependent increase in endosteal resorption and cortical porosity, but instead of estrogen deficiency the culprit is the senescence of mesenchymal/stromal cells and SASP. To test these hypotheses, we will elucidate the role of S100A8 and MMP13 in the cancellous bone resorption caused

by estrogen deficiency, respectively using mice with gain or loss of function of S100A8 in LysM expressing cells and mice with targeted deletion of MMP13 in Prx1 cells. Parallel studies on the role of SDF1 and its receptor CXCR4 will be pursued. The mechanisms and signaling cascades via which S100A8 and MMP13 regulate osteoclast generation and apoptosis and their cis- or trans- interactions with ERα will be studied in vitro. Lastly, the role of MMP13 and SDF1 in the effects of old age on cortical bone resorption will be studied by comparing the time of onset and severity of cortical thinning and porosity in 6, 16 and 22 month old mice lacking MMP13 or SDF1 in Prx1-targeted cells and littermate controls with and without ovaries long-term. Successful completion of this work should provide novel pathophysiologic insights that can inform the optimal therapeutic approach to the treatment of osteoporosis in elderly women and men. The graduate will gain a good understanding of basic bone biology, the hormonal regulation of bone metabolism, and the cellular and molecular mechanisms of osteoporosis. In particular, he or she will become familiar with the role of estrogens in bone health and disease, the function of the estrogen receptor in different bone cell types, and the search for estrogen target genes in vivo. Additionally, will become efficient in state of the art technology for preclinical bone research, including the generation and bone phenotypic analysis of mice with loss or gain of gene function in specific bone cell types using microCT imaging, bone histomorphometry, histochemistry, and cell differentiation and function assays.

Name: Dimitra Skondra

Institute: The University of Chicago

Description of research training/ clinical externship: 12-months translational training

Topic: Role of gut microbiome in Age Related Macular Degeneration (AMD)

Description of basic science project:

In my role as retina faculty at The University of Chicago, I am committed to providing the best possible care to our patients with complex retinal disorders and actively pursuing new ways to improve early identification, better management and better outcomes. My research focuses on retinal diseases, encompassing both clinical and translational research. As a clinician-scientist with previous experience in translational research in AMD and being part of a leading academic institution with excellent resources, expert physicians and scientists and state of the art equipped laboratories in gut microbiome filed , I am dedicated to pursue a multidisciplinary team approach of innovative research for retinal disorders investigating the role of high fat diet and gut microbiome in AMD, developing new preventative strategies could revolutionalize current management.

Name: Emmanuel Pothos

Institute: Tufts University School of Medicine

Description of research training/ clinical externship: 12-months basic science training

Topic: The role of quantal neurotransmission in real time in addiction, obesity and Parkinson's disease.

Description of basic science project:

Our laboratory team studies synaptic plasticity in CNS monoamine systems at the intersection of addictive. metabolic and neurodegenerative disorders. We approach chronic addiction to substances or high-energy foods as aversive states characterized by a potential continuum of neurotransmitter deficiencies in the CNS in real time that elicit the addictive behavior as a compensatory response. We also approach Parkinson's disease as a constellation of deficits in neuronal communication and synaptic plasticity that precede nigral cell death. We are now designing a series of functional assays to screen preclinical drug candidates for the treatment of addiction, obesity or Parkinson's disease on the basis of the effects of the candidate compounds on peripheral and central monoamine quantal neurotransmission in real time. The techniques used include carbon fiber amperometry, in vivo brain microdialysis and neurochemical assays coupled to high performance liquid chromatography with electrochemical detection.

Name: Eftychia Apostolou

Institute: Weill Cornell Medicine

Description of research training/ clinical externship: 12-months basic science training

Topic: Stem cell biology, reprogramming, epigenetics, chromatin conformation

Description of basic science project:

Role of three-dimensional chromatin organization in cell fate decisions Interplay of Transcriptional factors and chromatin architecture during reprogramming Role of mitotic bookmarking in cell fate decisions

Name: Maria Knikou

Institute: City University of New York

Description of research training/ clinical externship: 12-months basic science training

Topic: Neuroplasticity after Spinal Cord Injury

Description of basic science project:

Neurophysiological measures of cortical, corticospinal, and spinal neural excitability are taken before and after repetitive non-invasive transspinal and transcortical paired stimulation during robotic step training or at rest in people with Spinal Cord Injury or healthy control subjects. These measures will establish the underlying physiological mechanisms of action following non-invasive electromagnetic stimulation of the brain and spinal cord. Further, these measures will establish effective targeted neuromodulation strategies for neuroplasticity and neurorecovery of people with spinal cord injury.

Name: Nicholas (Nico) Katsanis

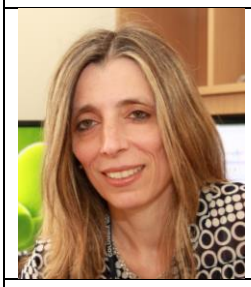
Institute: Duke University

Description of research training/ clinical externship: 12-months basic science training

Topic: Modeling Human Genetic Disease

Description of basic science project:

Our Center offers a unique, project-based atmosphere that is highly collaborative in a shared-resource setting. The ideal candidates will be accomplished, highly motivated, and creative scientists with interests in at least one of the three following areas: 1) understanding the architecture of human genetic disease; 2) investigating the mechanisms underlying disease processes and pathomechanism; and 3) identification of novel therapeutic paradigms for inherited disorders. Candidates will have the opportunity to work with unique patient cohorts; cell-based, zebrafish and/or mouse models; and cutting-edge molecular and imaging technologies in a state-of-the art facility. Research topics can be chosen based on the interests and background of the individual candidate.



Name: Stavroula Kousteni

Institute: Columbia University

Description of research training/ clinical externship:

Topic: The bone marrow niche in health and in myeloid malignancies

Description of basic science project :

Two possible directions: Examine the role of the bone marrow stromal cell microenvironment (niche) in hematopoietic aging and in the development of myelodysplasia (MDS) and acute myeloid leukemia (AML). Examine the role of bone in the regulation of appetite.

Name: Gerard Karsenty

Institute: Columbia University Medical Center

Description of research training/ clinical externship: 12-months basic science training

Topic: Unraveling the impact of bone on whole organism physiology

Description of basic science project:

Explore the role of the bone-derived hormone osteocalcin, in the regulation of various physiological processes. All studies are conducted in several mouse models we have generated and requires a solid molecular biology training. Organs targeted by osteocalcin and currently studied are: the central and peripheral nervous systems, the adrenal glands, testes and pancreatic islets.

Name: Stavros Drakos

Institute: University of Utah School of Medicine & Univ. of Utah Healthcare

Description of research training/ clinical externship: 12-months basic science training

Topic: Understanding cardiac recovery utilizing human and animal myocardial tissue

Description of basic science project:

This translational project is focused on cardiac recovery associated with unloading and mechanical circulatory support in the chronic heart failure setting. Dr Drakos's team is utilizing clinical and cardiac metabolism biological information derived from studies in heart failure patients and small animal HF models to understand and manipulate myocardial recovery. Dr. Drakos's NIH-funded laboratory is housed at the Nora Eccles Harrison Cardiovascular Research and Training Institute-CVRTI: http://www.cvrti.utah.edu/~drakos/Site/index.html Dr. Drakos has published original work generated both in his lab and in the clinical arena which led to the establishment of the award-winning Utah Cardiac Recovery Program (UCAR). Dr. Drakos is co-chairing the NIH/NHLBI Working Group on Myocardial Recovery: its executive summary and member list can be found at http://www.nhlbi.nih.gov/research/reports/nhlbi-working-group-advancing-science-myocardial-recovery-mechanical-circulatory-support . Along the same lines Dr. Drakos is co-directing the Annual International Utah Cardiac Recovery Symposium (UCARS) - for more info http://medicine.utah.edu/cardiacrecoverysymposium/ For Info regarding life in scenic Utah please visit: http://healthsciences.utah.edu/living-in-utah.php and http://healthsciences.utah.edu/why-utah.php

Name: Iannis Aifantis

Institute: NYU School of Medicine

Description of research training/ clinical externship: 12-months basic science training

Topic: Molecular mechanisms of differentiation and transformation of hematopoietic stem cells and progenitors

Description of basic science project:

My laboratory focuses on molecular mechanisms of differentiation and transformation of hematopoietic stem cells and progenitors. More specifically, we focus on mechanisms of both lymphoid (T-ALL) and myeloid (AML, CML, CMML) leukemia initiation and progression. Our work has identified and studied a number of novel oncogenes (including NOTCH1), tumor suppressors (including FBXW7, TET2, CYLD, EZH2, UTX, cohesins) and downstream oncogenic signaling pathways. We have used these pathways to design molecularly targeted therapeutic protocols that inhibit the induction or affect the maintenance of the disease. Moreover, the laboratory is studying mechanisms of hematopoietic stem cell differentiation and self-renewal using both genomic and genetic approaches. Current areas of focus for our lab include the impact of DNA methylation in stem cell transformation, the mapping of long non-coding RNAs in a number of human tumors, the understanding of the impact of the 3D chromosomal architecture in cancer, the role of stress responses in human malignancy and the in vivo mapping of the tumor microenvironment for acute leukemia. Finally, we have recently expanded our scope and focused on the regulation of tumor progression and metastasis in selected solid tumors with an emphasis once again on cancer-initiation mechanisms that include protein stability, epigenetics and tumor microenvironment.