CENTER ON HUMAN DEVELOPMENT & DISABILITY
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New Research Affiliates Join CHDD

Research Affiliates of the CHDD are faculty members at the University of Washington with special interest and special expertise in the field of neurodevelopmental disorders. Over 100 affiliates are actively participating in CHDD-relevant research activities and are critical to our strategic plans and our efforts to intensify our basic and translation research mission.

Efforts to further expand and enhance our research program continue as three Research Affiliates have recently joined the CHDD. Their areas of expertise and interests range widely and include systems neuroscience research utilizing a wide range of modalities, a focus on cellular and molecular mechanisms underlying genetic epilepsies, and the design of molecular therapies for brain malformation disorders.

To introduce these new affiliates to the CHDD community, their research programs are described below.

Mike Guralnick, Ph.D., Director and Professor

Nina de Lacy, M.D., M.B.A., is an Acting Assistant Professor of Psychiatry & Behavioral Sciences. Dr. de Lacy's research in systems neuroscience centers on delineating the structure of whole brain functional organization in children, adolescents, and adults, and examining differences in major developmental neuropsychiatric disorders particularly intellectual disability, autism, and ADHD. She focuses on examining motifs in functional and structural MRI and relating them to psychometric, observational, and genetic/genomic data to probe mechanisms that may better subgroup individuals with these overlapping disorders. A special interest is brain functional control systems and connectivity. In datasets of thousands of individuals, de Lacy applies advanced computational techniques such as machine learning to isolate motifs and develop hypotheses to apply to smaller, targeted subject groups.

Franck Kalume, Ph.D., is an Assistant Professor of Neurological Surgery, Pharmacology, and Global Health. Dr. Kalume's research interests focus on understanding the pathophysiological basis of genetic epilepsies and their co-morbid conditions. Kalume's goal is to pave the way for the discovery of future therapeutic approaches for these disorders. Current research projects center on studies of the cellular and molecular mechanisms underlying sudden unexpected death in Leigh syndrome (LS), a debilitating neurodegenerative disorder. LS is strongly associated with loss-of-function mutations in NDUFS4, the gene that encodes a subunit of the protein complex I in the mitochondrial electron transport chain. Kalume's lab uses innovative approaches that combine behavioral assays, patch-clamp electrophysiology, electroencephalography, electrocardiography, plethysmography, immunohistochemistry, and mouse genetic techniques to identify changes in neuronal and network excitability that cause epilepsy and associated conditions in mouse models of LS. Other work consists of studies of the effects of a novel PIK3ca inhibitor on seizures and related motor and behavioral phenotypes of Dravet syndrome mice and the impact of non-pharmacological manipulation of sleep and circadian rhythm on seizures and autistic features of Dravet Syndrome mice.

Ghayda Mirzaa, M.D., is an Assistant Professor of Pediatrics. Dr. Mirzaa's research focuses on the phenotypic delineation and gene discovery for brain malformation-epilepsy syndromes associated with megalencephaly, microcephaly, and focal cortical dysplasia. Mirzaa's current studies leverage earlier genetic discoveries to define molecular aberrations in affected human brain tissues on a single cell level, with a special emphasis on the detection of low frequency genetic variation and pathway dysregulation using high throughput genomic, transcriptomic, and proteomic methods to facilitate molecularly targeted therapies. Mirzaa is also developing ways to make it easier to access and interpret human genomic data. She has designed and implemented the Developmental Brain Disorder Database, a web-based tool that delivers information on the genes associated with neurodevelopmental disorders and makes it easier for researchers to understand which genes are associated with specific aspects of particular disorders.

CHDD is an interdisciplinary center dedicated to the prevention and amelioration of developmental disabilities through research, training, clinical service, and community outreach. CHDD includes the University Center of Excellence in Developmental Disabilities and the Eunice Kennedy Shriver Intellectual and Developmental Disabilities Research Center.

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