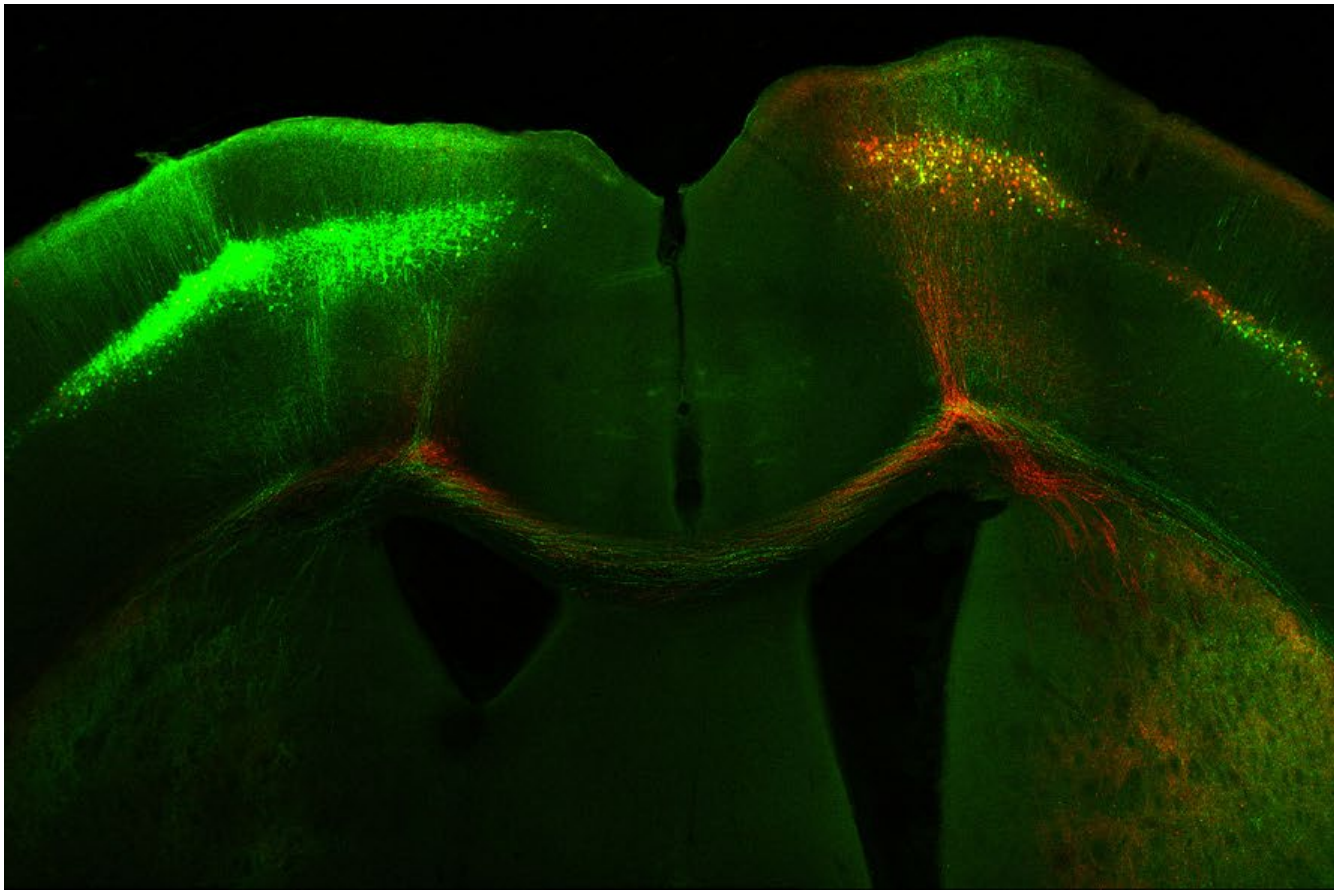
CoNDA Center

cognitive neuroscience of development and aging



VISIT OUR WEBSITE

A note from the Director, Anna Dunaevsky, PhD

In this Issue:

This Fall, we are very excited to begin Phase 2 of the CoNDA Center. We made a lot of progress during Phase 1 and have much to celebrate; in total, we supported 43 individual investigators through our Research Project, Pilot Project and Research Core voucher programs. Our investigators were awarded over $18.5 million in extramural research funding, published more than 250 articles, and have given more than 140 scholarly publications subsequent to CoNDA support.

Additionally, we established the Translational Imaging and Behavioral Analysis (TIBA) Research Core to complement the human-centered Neuroimaging Acquisition and Analysis (NA2) Core, further providing the cutting-edge tools investigators need to rise to the forefront of our field. The first five years of the COBRE have proven to be successful, and we are eager to continue building toward our mission of supporting neuroscience research in the Omaha region.

I want to thank our CoNDA Community of investigators, mentors, research core directors, students and trainees for continuing to work together toward our important mission during the long wait for the Center's renewal. After a long wait with unprecedented uncertainty, we are ready to make a fresh start and hit the ground running with a new cohort of CoNDA investigators. Announcements for new funding opportunities and future seminars will be coming soon – looking forward to seeing you all in Phase 2!

About our Center

The Cognitive Neuroscience of Development and Aging (CoNDA) Center

Neurocognitive disorders are among the most prevalent and disabling health conditions worldwide. Prevalence of both neurodevelopmental disorders such as Autism Spectrum Disorders (ASD) and age-related neurological disorders such as Alzheimer's disease (AD) are on the rise, presenting an urgent need to identify mechanisms and treatments.

The Cognitive Neuroscience of Development and Aging (CoNDA) Center, a multi-institutional Center of Biomedical Research Excellence (COBRE) based at the University of Nebraska Medical Center in Omaha, addresses these needs. The scope of the CoNDA Center spans from basic studies in animals to clinical research with human subjects, uncovering molecular, cellular, circuit, and brain mechanisms that underlie lifespan disorders of cognition. A major role of the Center is to support and mentor the development of junior investigators who study brain function and dysfunction in development and aging.

To see our vision through, the CoNDA Center's mission is to support research projects, pilot projects, Research Cores, a Seminar and Career Development Series, skills workshops, and many more activities to build and strengthen a strong research infrastructure for junior investigators to thrive.

As of August 21st, 2025, the CoNDA Center is entering its' sixth year, the first year of Phase 2.

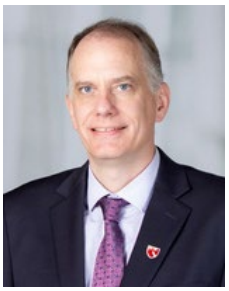
Phase II Research Project Leaders

Kuan-Hua Chen, PhD

Assistant Professor, UNMC Neurological Sciences

Project Title: *Interpersonal MEG/EEG Correlations & Physiobehavioral Synchrony in Dementia Patients and Caregivers*

Physiobehavioral synchrony—such as two people showing synchronized heart rates or laughing together during social interactions—is a biobehavioral measure of social connectedness. Alzheimer's disease and related dementias are debilitating conditions that reduce social connectedness, including physiobehavioral synchrony, between persons with dementia (PWDs) and their family caregivers (CGs). Leveraging CoNDA's state-of-the-art techniques, including magnetoencephalography (MEG) combined with electroencephalography (EEG), this project investigates the functional neural mechanisms underlying reduced PWD-CG physiobehavioral synchrony. We will record MEG/EEG data from 90 dementia care dyads to identify neural signal patterns (i.e., similarity between PWD's and CG's MEG/EEG activity) associated with lower physiobehavioral synchrony. We will also examine how associations between MEG/EEG patterns and synchrony are moderated by the emotional context (positive vs. negative) of social interactions and examine how dyads' MEG/EEG similarity contribute to physiobehavioral synchrony and, in turn, health outcomes. Findings from this project will advance understanding of how dementia affects PWDs, their CGs, dyadic processes, and health outcomes.



Christopher Kovach, PhD

Assistant Professor, UNMC Neurosurgery

Project Title: *Investigating the Role of Attention in Perceptual and Cognitive Consequences of Parkinson's Disease*

Cognitive and emotional impairments are a significant source of morbidity in Parkinson's disease (PD), beyond the hallmark motor symptoms; yet they remain a poorly understood aspect of the disorder. Among the significant and debilitating non-motor symptoms of PD are deficits in perception of social cues, like facial expressions of emotion; as of yet, no unified model of motor and perceptual symptoms in PD has been demonstrated. Because eye movement is altered in PD in a manner consistent with other motoric changes, and because normal eye movement is closely linked to visuospatial attention, this possibility points to a common origin for attentional, perceptual, and oculomotor symptoms of the disorder. Attentional control is an essential element of a wide range of cognitive processes, including working memory and executive function. We propose a focused test of this theoretical perspective by examining whether and how abnormal eye movements in PD associate with impaired perceptual judgment of facial emotion, under the working hypothesis that impaired perception of facial expression will correlate tightly with abnormal patterns of gaze to faces. The opportunity to record from and stimulate structures targeted by therapeutic deep brain stimulation (DBS) will allow a detailed interrogation of the hypothesis and inform models of neural pathways governing attentional control.

Haiying Shen, MD, PhD

Assistant Professor, UNMC Pediatric Neurology

Project Title: *Modulating PNNs to Mitigate Epileptogenesis and Neurobehavioral Deficits in Mouse Models*

Epilepsy is a brain disorder where seizures become frequent and long-lasting over time. While crrent medications can help control seizures, they do not stop epilepsy from developing, and their effectiveness often decreases with use. A key factor in this rocess is the breakdown of protective structures around brain cells called perineuronal nets (PNNs). These nets support specific brain cells that help keep brain activity balanced. However, during seizures, harmful enzymes break down PNNs, leading to increased seizure risk and cognitive problems. Our research aims to understand how PNNs influence epilepsy development and whether preserving them can prevent seizures from worsening. In this CoNDA Research Project, we will study how PNNs change in different stages of epilepsy, how a key protein, OTX2, helps maintain PNN strength, and whether a safe, FDA-approved drug, dolutegravir, can protect PNNs and reduce seizures. By learning how to keep PNNs intact, we hope to develop new treatments that not only control seizures but also prevent epilepsy from progressing, improving the quality of life for people with epilepsy.

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CoNDA Research Cores

The primary objective of the CoNDA Center's Research Cores is to support innovative and collaborative research in the areas of neurocognition in health and disease across the lifespan. The CoNDA's Cores provides the resources, major equipment and technical expertise necessary for state-of-the-art assessment of brain structure, function, and dynamics in both humans and animal models.

Neuroimaging Acquisition & Analysis (NA2) Core

Magnetic Resonance Imaging (MRI) Sub -Core

Core Lead: David Warren, PhD

Magnetoencephalography (MEG) Sub -Core

Core Lead: Valentina Gumenyuk, PhD

Translational Imaging & Behavioral Assessment (TIBA) Core

Animal Behavior Sub -Core

Core Lead: Mystera Sameulson, PhD

Small Animal MRI Sub -Core

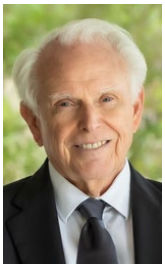
Core Lead: Yutong Liu, PhD

In-Vivo Imaging Sub -Core

Core Lead: Padmashri Ragunathan, PhD

CoNDA MEG Core

Phase II Advisory Committee



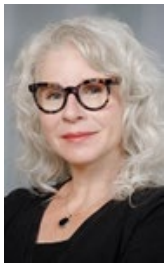
William Mobley, MD, PhD
Associate Dean of Neurosciences Initiatives and Distinguished Professor of Neurosciences
University of California San Diego
CoNDA AC Chair

Qian-Quan Sun, PhD
Professor, Department of Zoology & Physiology and Director, Wyoming Sensory Biology COBRE
University of Wyoming

Rick Bevins, PhD
Mildred Francis Thompson University Professor of Psychology and Director, Rural Drug Addiction Research COBRE
University of Nebraska – Lincoln

Ken Bayles, PhD
Vice Chancellor for Research and Professor, Department of Pathology, Microbiology, & Immunology
University of Nebraska Medical Center

Patricia Reuter -Lorenz, PhD
Chair, Department of Psychology and Michael I. Posner Collegiate Professor of Psychology & Neuroscience
University of Michigan



Jennifer Blackford, PhD
Hattie B. Munroe Endowed Chair and Associate Dean of Research, Munroe-Meyer Institute; Professor of Neurological Sciences, Pediatrics and Psychology – University of Nebraska Medical Center

The CoNDA Center's Advisory Committee is made up of experts from institutions throughout the nation who study cognitive neuroscience across the lifespan, publish high-impact work, and have experience serving as COBRE PIs or in other leadership positions. The function of the COBRE's Advisory Committee (AC) is to advise the Center director regarding administrative operations, evaluate Research Project Leader (RPL) progress and advocate for their support, and provide generalized recommendations to CoNDA Project Leaders, Core Directors, and Administrative Staff alike. The CoNDA's Advisory Committee meets twice per year - once virtually, and once in-person for an annual conference in Omaha.

CoNDA Mentoring Committee

Howard Fox, MD, PhD
Senior Associate Dean of Research & Development, College of Medicine; Professor, Department of Neurological Sciences at UNMC

Jeffrey French, PhD
Professor, Departments of Neuroscience and Psychology at the University of Nebraska at Omaha

Peter Steyger, PhD
Professor, Biomedical Sciences and Director, Richard J. Bellucci Translational Hearing Center COBRE at Creighton University

Wallace Thoreson, PhD
Professor, UNMC Department of Ophthalmology and Visual Sciences; Vice Chair and Research Director, Truhlsen Eye Institute at UNMC

David Warren, PhD
Associate Professor, Department of Neurological Sciences; Director, CoNDA NA2 Core; Associate Director, CoNDA Center at UNMC

CoNDA
Partnering Institutions:

The CoNDA Center provides a structured mentoring program; each CoNDA Research Project Leader chooses two mentors in their area of expertise to guide them through their CoNDA Project and provide general career advice. Representatives from each CoNDA Partnering Institution (UNMC, University of Nebraska at Omaha, and Creighton University) comprise the Mentoring Committee; collectively, they advise the Center Director, and the Research and Pilot Project Leaders through monthly Research Development Forums.

CoNDA Alumni Updates

The metric of success for a COBRE Project Leader is to "graduate" by receiving NIH R01-level independent grant funding. The CoNDA Center congratulates three recent graduates on receiving new R01 grants and beginning the next stage of their independent scientific careers!

Peng Zhong, PhD

Assistant Professor, UNMC Neurological Sciences

CoNDA Research Project Title: "Hypothalamic Sleep-Wake Neuron Defects in Alzheimer's Disease"

R01DA061306: "Mechanistic studies of opiate withdrawal-induced sleep disturbances"

Holly Stessman, PhD

Associate Professor, Department of Pharmacology & Neuroscience, Creighton University

CoNDA Pilot Project Title: "Impact of KMT5B Expression on Choroid Plexus Development and Macrocephaly"

R01MH133600: "Epigenetic regulation of the neuroendocrine axis in brain development and behavior"

Jee-Yeon Hwang, PhD

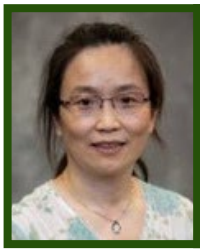
Associate Professor, Department of Pharmacology & Neuroscience, Creighton University

CoNDA Pilot Project Title: "Neuroinflammation in Neurodegeneration and Cognitive Impairment associated with Global Ischemia"

R01NS134993: "A Novel Therapeutic Strategy Targeting Neuroinflammation for Global Cerebral Ischemia Associated with Cardiac Arrest"

Upcoming CoNDA Events

The CoNDA Center hosts a monthly Research Seminar Series with guest speakers nominated by the CoNDA Community. Seminars are always held on Zoom and in-person when possible, on the 4th Wednesdays of the month at noon.



"The Role of Myd88 in the Pathogenesis of Alzheimer's Disease"

August 27th, 2025

Junlin Yang, PhD (U. Illinois)

"Multimodal Approaches to Interrogate Critical Genes for Brain Development & Autism"

September 24th, 2025

Xinyu Zhao, PhD (U. Wisconsin)

SEMINAR TITLE TBA

October 22nd, 2025

Alexander Rotenberg, MD/PhD

(Harvard Medical School)

CoNDA Advisory Committee Meeting

October 30 -31, 2025

Omaha, NE

By invitation only.

Want to nominate a guest speaker for the CoNDA Seminar Series? Click here!

Click here to explore our list of past seminar guests; many recordings are available upon request!

Each year since 2020, the CoNDA Center has hosted a **Colloquium** to bring together our project leaders and their labs to share their latest research advancements.

More information coming soon: **click here to join our mailing list!**

CoNDA Center Colloquium

April 2026

Keynote Speaker:

Thomas Kilduff, PhD

Director, Center for Neuroscience

SRI International