



# NEWSLETTER



**Dr. MD Mehedi Hasan, PhD**  
Postdoctoral Researcher  
Tulane Center for Aging  
COBRE Bioinformatics Core

## BIOINFORMATICS RESEARCH

Dr. Mehedi Hasan, a postdoctoral researcher affiliated with the COBRE Grant Bioinformatics Core at the Tulane University Center for Aging, has made substantial contributions to the field of aging research. His innovative investigations primarily revolve around the analysis of the Frailty Index in Healthy Aging Animals and the Religious Orders Study/Memory and Aging Project (ROSMAP) as a means to study aging. Dr. Mehedi Hasan's work is distinguished by his employment of cutting-edge methodologies and his expertise in analyzing various omics data, including Next-Generation Sequencing (NGS) data. Additionally, his research has yielded tangible outcomes, such as the development of widely-utilized software tools and significant scientific publications. Dr. Mehedi Hasan's association with the Center for Aging is rooted in his ardent interest in comprehending the intricate processes of aging, and as a postdoctoral researcher within the Bioinformatics Core, he actively contributes to the Center's mission of unraveling the complexities of aging through the application of innovative technologies in research.

Dr. Mehedi Hasan attributes his research direction and dedication to data science within the COBRE Grant to the guidance and mentorship of prominent figures in his field, notably Dr. Jazwinski (COBRE Grant Principle Investigator) and Dr. Sangkyu Kim (COBRE Bioinformatics Core Director). Throughout his career, Dr. Mehedi Hasan has achieved several noteworthy research milestones. His groundbreaking analysis of scMultiome data in blood MCMV virus has garnered recognition within the scientific community, highlighting the significance of understanding the impact of viral infections on aging processes. Furthermore, Dr. Zvezdaryk (Lead Investigator) along with Dr. Mehedi Hasan (Co-Investigator) studied the effects of intermittent cytomegalovirus infection on neurobiological metabolism and cognitive deficits in mice have shed light on the intersection of viral infections and age-related cognitive decline. Moreover, his software tools, including Meta-i6mA and Deepm5C, have gained global recognition and adoption, playing a crucial role in advancing research endeavors by facilitating the analysis and interpretation of complex omics data for numerous researchers. Despite the challenges associated with selecting research topics and securing funding, Dr. Mehedi Hasan remains resolute in exploring new avenues and achieving further breakthroughs in understanding the aging process.

Dr. Mehedi Hasan's forthcoming research will focus on the single-cell RNA analysis of the Religious Orders Study/Memory and Aging Project (ROSMAP). This undertaking is expected to provide deeper insights into the molecular and cellular processes underlying age-related changes in brain tissues, thereby expanding our understanding of neurodegenerative disorders associated with aging. With ongoing projects and future endeavors, he is poised to make further strides in comprehending the aging process and enhancing the well-being of older adults. As of July 2023, Dr. Hasan's publications have been cited more than >2,100 times and his H-index is 30 and i10 index is 48.

Dr. Mehedi Hasan's significant contributions to the field are reflected in his publications, which have had a notable impact. Among his important works are:

"HLPpred-Fuse: improved and robust prediction of hemolytic peptide and its activity by fusing multiple feature representation."

"Deepm5C: a deep-learning-based hybrid framework for identifying human RNA N5-methylcytosine sites using a stacking strategy."

"Intermittent Cytomegalovirus Infection Alters Neurobiological Metabolism and Induces Cognitive Deficits in Mice."

# DISASTER RESILIENCE AND AGING RESEARCH

Marlene Friis, a dedicated PhD student in the Tulane University Interdisciplinary PhD in Aging Studies program, has conducted noteworthy research in the field of disaster studies, specifically focusing on the needs of the elderly during flooding events. In her recent publication titled "Younger and older adults' perceptions of stressors after a flood" in the journal *Traumatology*, Friis sheds light on the challenges faced by older adults in flood-prone areas and provides valuable insights with implications for residents of Louisiana, coastal regions, and other flood-affected areas nationwide. The impetus for Friis's research originated from the devastating floods that struck south Louisiana in August 2016, following the destructive hurricanes Katrina and Rita a decade earlier. Acknowledging the necessity to comprehend the experiences and requirements of the elderly during such disasters, Friis employed over 200 interviews conducted by Dr. Cherry of Louisiana State University to gather crucial data for her study. To examine the influence of age on flood response, Friis categorized the participants into three groups based on their flood exposure: those who had never encountered flooding, those experiencing their first flood, and those who had previously encountered flooding.



Marlene Friis  
PhD Student  
Interdisciplinary PhD in Aging Studies

The study found several significant stressors experienced by older adults according to the interviews. Surprisingly, even individuals in the control group who had not personally experienced flooding were profoundly affected by the floods. They assumed the responsibility of providing housing and support for those whose homes were affected by the disaster, underscoring the interdependence within the community during crises. Among the interviewed older adults, those who had previously experienced flooding before 2016 suffered the most substantial financial losses. These individuals faced difficulties in recovering their losses, leading to mounting debt and financial stress. Furthermore, the research demonstrated that the older cohort exhibited reduced involvement in inter-family dynamics, as they prioritized financial matters and recovery timelines, resulting in increased social isolation. The broader implications of this research extend beyond the geographical scope of Louisiana, serving as a valuable resource for understanding the vulnerabilities of coastal and flood-prone areas across the United States. Policymakers can employ this understanding of age-related vulnerabilities and challenges faced by the elderly during floods to develop strategies for mitigating these issues. The research highlights the necessity for heightened awareness and preparedness among residents of flood-prone regions. It emphasizes that natural disasters can affect anyone, regardless of their location or perceived risk. Taking proactive measures to secure homes, important documents, and belongings can help reduce individual vulnerabilities. At the structural level, Friis's work underscores the need for federal assistance in flood-prone areas, particularly in supporting the elderly population, which often experiences worse outcomes following floods. Policies should concentrate on enhancing accessibility and affordability of flood insurance for all residents, as escalating insurance costs and withdrawal of insurance companies from high-risk areas exacerbate the problem.

Friis presented her research findings at the State of the Coast Conference held in New Orleans from May 31 to June 2, 2023. Her work not only sheds light on the challenges faced by elderly individuals during flooding but also addresses the potential adverse impacts of large-scale coastal projects, such as the Mid-Barataria Sediment Diversion. Looking ahead, Friis aims to investigate the influence of infrastructure on the elderly population in flood-prone regions. By comprehending how infrastructure affects the well-being of older adults during and after flooding events, her future research will contribute to enhancing the resilience and preparedness of communities. Friis's research has made significant strides in understanding the needs and vulnerabilities of elderly residents during flooding events. Her study underscores the importance of individual and structural efforts to mitigate the impact of floods. By implementing proactive measures and ensuring equitable access to resources such as flood insurance, communities can better support their elderly population and enhance overall disaster resilience. Friis's work serves as a crucial resource for policymakers, researchers, and residents of flood-prone regions in their ongoing endeavors to protect vulnerable populations and build more resilient communities.

# AIG MEETINGS

July 24, 2023

**Dr. Elizabeth Engler-Chiurazzi, PhD**

<https://tulanehipaa.zoom.us/j/95651882258>

4:30-5:30PM

July 31, 2023

**Marlene Friis, student**

<https://tulanehipaa.zoom.us/j/94612474325>

4:30-5:30PM

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## Contact us!

Please feel free to reach out about publications, grants, events, or other information you would like to share.

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