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Università
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SCIENZE BIOMEDICHE E

MEDICINA TRASLAZIONALE

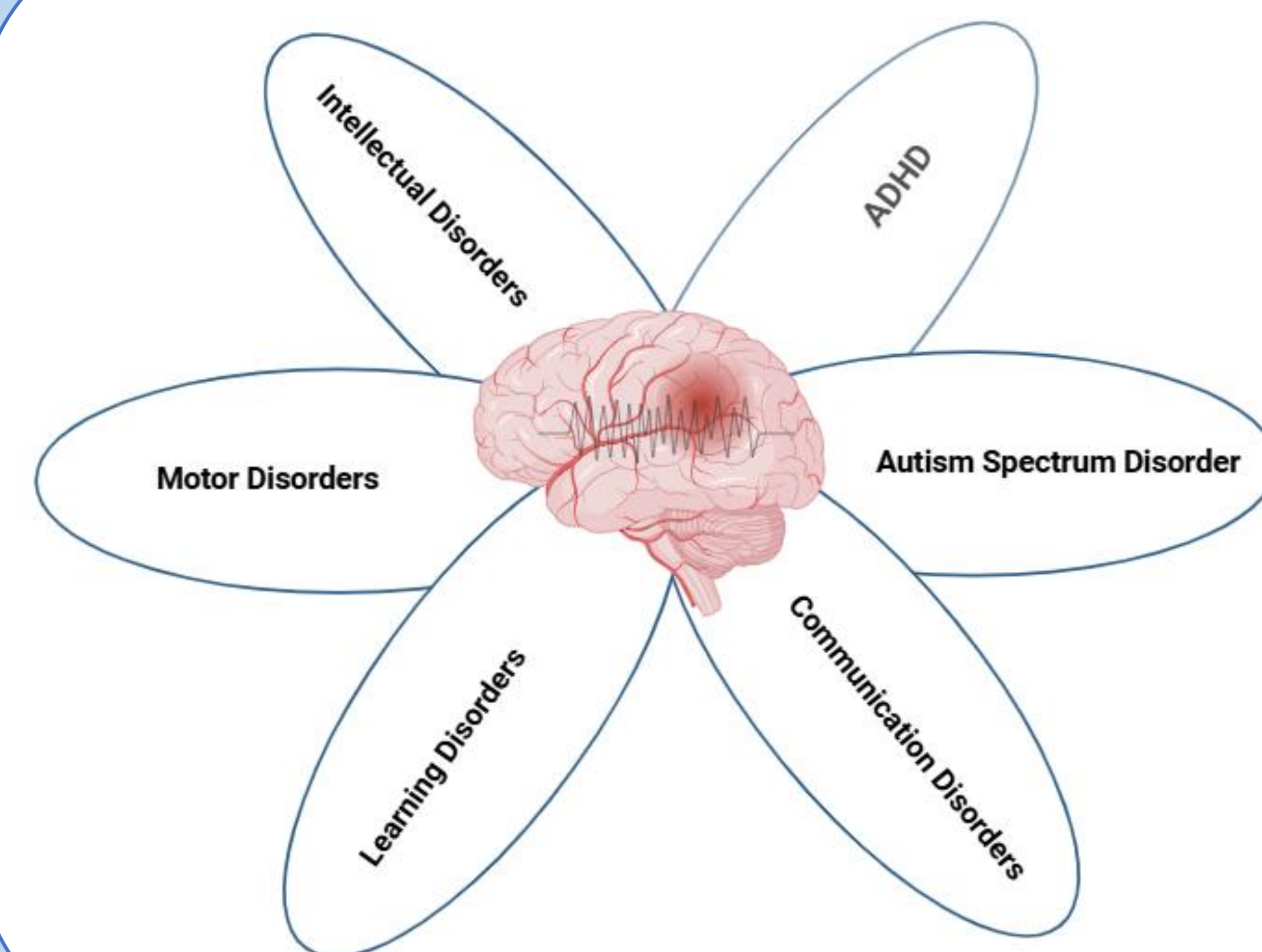
Investigation of Morphological and Functional Brain Alterations in Neurodevelopmental Disorders

BACKGROUND

Neurodevelopmental disorders (NDDs) are a diverse group of conditions that begin during early brain development, leading to lifelong cognitive, behavioral, and motor impairments. These disorders, which include autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), and schizophrenia, affect millions of individuals in the world. Given their early onset and chronic nature, NDDs impose a significant social, economic, and medical costs on patients, families, and healthcare systems.

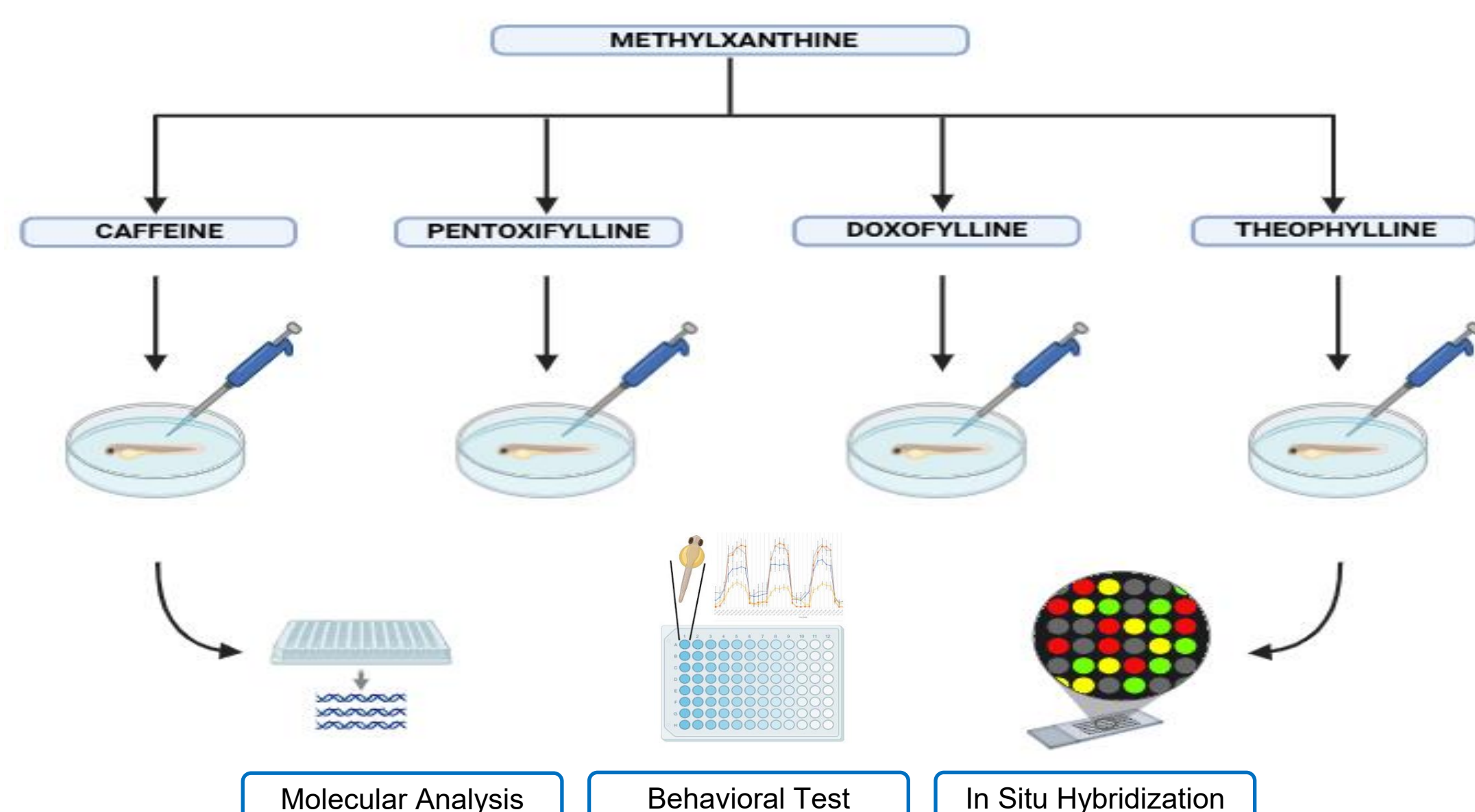
A defining feature of NDDs is the presence of structural and functional alterations in the brain, which disrupt regular neural connectivity and signaling. Epidemiological data indicate that NDDs are more commonly diagnosed in males than females, with male-to-female ratios of approximately 4:1 in ASD and 2:1 in ADHD. However, the biological mechanisms underlying these morpho-functional alterations and this gender imbalance remain poorly understood.

My research projects aim to clarify possible risk factors that can cause neurodevelopmental alterations and characterize the resulting structural and functional alterations at the brain level. This will allow to develop targeted therapeutic strategies.

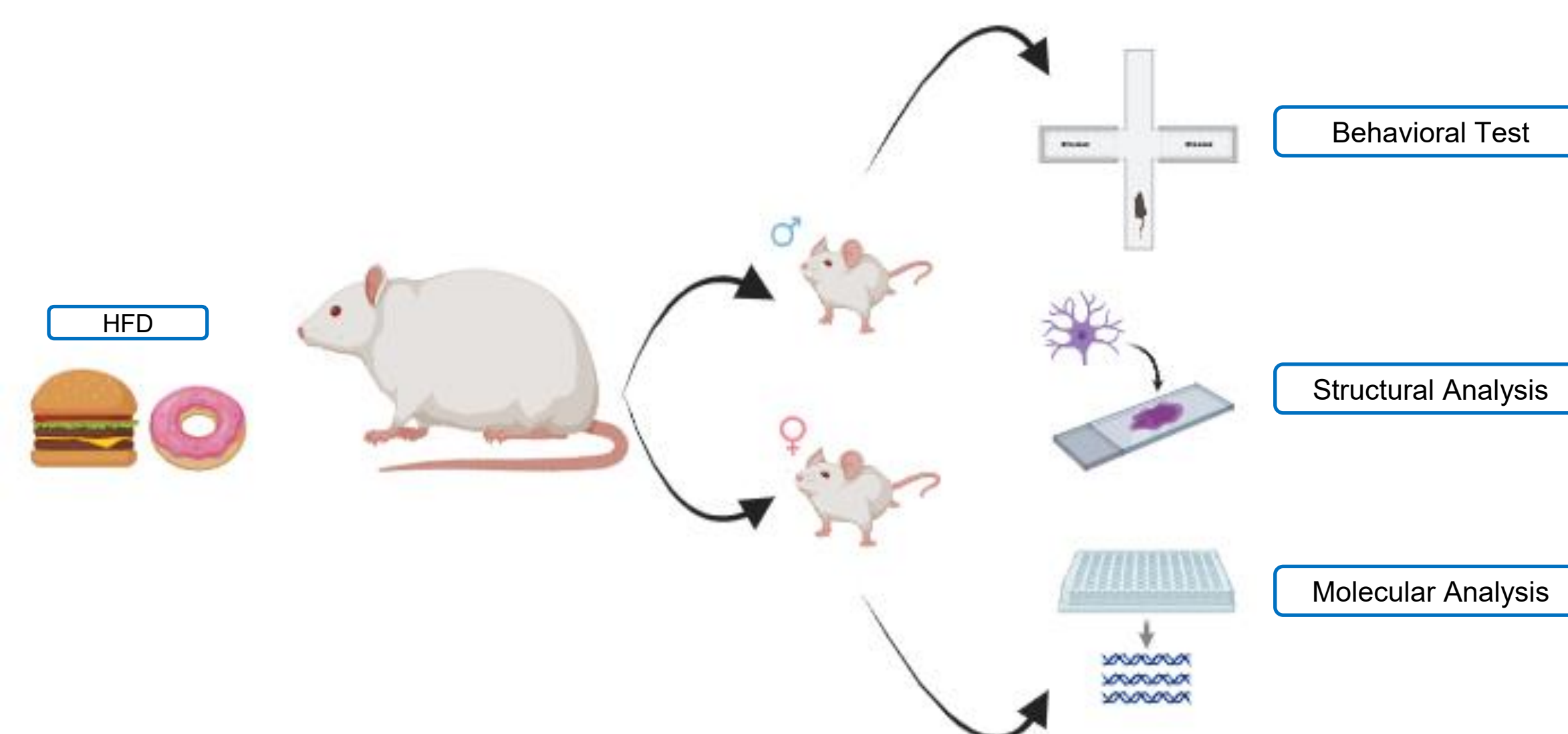


MODELS & METHODS

Zebrafish & Methylxanthine



High Fat Diet Rats



AIMS & PROSPECTIVES

- To study the impact of environmental stimuli (methylxanthines and high-fat diet) on neurodevelopment.
- Combining behavioral, molecular, and neuroanatomical analyses to identify key alterations linked to NDDs.
- Providing crucial insights into sex differences, molecular dysregulations, potential therapeutic targets, and improving treatment strategies for those affected by NDDs.
- This research potentially is a bridge between experimental models and clinical applications, paving the way for more investigation of the impact of environmental and pharmacological factors on neural development and connectivity.