**Diving into human mental health with zebrafish**

Mental health affects human’s way of thinking, feeling, and acting, and represents therefore a worldwide critical concern. Both environmental and genetic factors can impair individual’s mental health increasing the risk of developing mental disorders. Our research aims to identify these genetic factors and possible therapeutic targets.

Psychiatric disorders such as ADHD, schizophrenia, autism spectrum disorder, and addiction, represent a high economic and social burden with 1 in 8 people being affected in 2019. In the last two years, anxiety and depressive disorders have increased of 26% and 28% respectively because of the COVID-19 pandemic. It is therefore evident how environmental factors such as social interactions increase the risk to develop such disorders. Genetic factors also contribute to its liability with heritability estimates ranging from 40-60%. Identifying genes involved in the onset of psychiatric disorders and their contribution to its pathogenesis is therefore crucial to develop novel therapeutics.

Danio rerio, well-known as zebrafish, is a very powerful model in biomedical research. Zebrafish is a small freshwater teleost fish widely employed in neurobiological and behavioral studies because of its advantages over other vertebrate models such as small size, rapid development, high reproductive capacity and number of offspring, easy genetic manipulation. Furthermore, 84% of the genes associated with human psychiatric disease have a zebrafish counterpart and zebrafish show conservation of main human neural circuits such as dopaminergic, serotoninergic, and cholinergic systems. In addition, over the last decade, the number of behavioral assays in zebrafish have increased confirming its translational validity and offering the possibility to exploit the advantages of this model to identify molecular mechanisms involved in behavioral phenotypes associated with psychiatric disorders.

In our research we aim to:

* identify genes potentially involved in the onset of disorders by means of bioinformatic tools or forward genetic studies
* induce loss of function mutations for the candidate gene/s using the CRISPR-Cas9 genome editing technique
* characterize the associated behavioral phenotype and identify the molecular pathways involved.

This will help develop new therapeutics of translational relevance for human psychiatric disease.