Neurological and psychiatric diseases account for about one third of all human diseases and are a major source of morbidity, mortality and impaired quality of life. This proportion is increasing with ageing of the population and represents a major economical challenge (387 billion Euros/year in Europe). Neuroscience research and its translation into improved diagnosis and therapy has a high priority. In spite of this, progress in neuropharmacology and therapeutics worldwide is largely stalled, with only a minority of lead substances qualifying for clinical use. This is due in part to our limited understanding of brain function in both health and in neurological and psychiatric pathologies, and to the lack of appropriate animal models to mimic these conditions and to assess the validity of candidate drugs at the systemic level.

The nervous system of the zebrafish (*Danio rerio*) is relatively simple while sharing many fundamental similarities with other vertebrates including humans. Crucially, even "higher brain functions" such as emotional, motivational and cognitive processes are evolutionary conserved and can be robustly assessed in zebrafish. This behavioral repertoire is complemented by the ever-increasing availability of neuronal class-specific transgenic tools with which to assess connectivity, report neuronal activity and control circuit activity in the behaving animal, be it wildtype, genetically modified or pharmacologically treated. Hence, the zebrafish offers unsurpassed potential to elucidate the pathophysiology and genetic basis of neurological and psychiatric diseases.

It is imperative for the European Community to support calls for funding exploiting these promises of vast economic potential, and specifically aiming to:

1. bringing together zebrafish neurobiologists, human neurogeneticists, clinical neurologists and psychiatrists to i) identify and understand the neuronal circuits controlling normal and pathological behaviors (deciphering the behavioral "connectome") and ii) establish zebrafish models to functionally annotate genetic loci linked to neurological or psychiatric disorders in humans. These models will validate human disease loci (including those inferred from genome-wide association studies), define new biomarkers, identify neuroanatomical, functional and behavioral endophenotypic traits associated with disease, and provide readily accessible models for drug testing at these different levels of analysis.

2. utilizing the unrivaled potential of zebrafish as a platform for drug discovery fighting neurological and psychiatric disorders. The zebrafish provides a unique moderate to high-throughput whole animal drug-testing model that sits between *in vitro* assays and cumbersome mammalian models. Well-defined zebrafish models already exist that share behavioral or neurological deficits with attention and anxiety syndromes, aggressive behaviors, addictive disorders, and a number of neurodegenerative illnesses. The unbiased quantitative assessment of behaviours in response to genetic or pharmacological insult will further provide many new diagnostic behavioural biomarkers for neurological dysfunction.

The EC has a strong research base in zebrafish brain and behavior research and provides an extensive industrial infrastructure of pharmaceutical companies. The zebrafish is set to become the leading vertebrate model for combined modeling of neurological diseases and high-throughput validation of therapeutic compounds at the organismal level. Building on these strengths we deem it imperative for the EC to promote closer interaction between zebrafish neurobiologists, clinical centers, and pharmaceutical companies for the economic and medical benefit of EC citizens.