Zebrafish Larvae Model: A High Throughput Screening Tool to Study Autism

Authors : Shubham Dwivedi, Raghavender Medishetti, Rita Rani, Aarti Sevilimedu, Pushkar Kulkarni, Yogeeswari Perumal

Abstract : Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder of early onset, characterized by impaired sociability, cognitive function and stereotypies. There is a significant urge to develop and establish new animal models with ASD-like characteristics for better understanding of underlying mechanisms. The aim of the present study was to develop a cost and time effective zebrafish model with quantifiable parameters to facilitate mechanistic studies as well as high-throughput screening of new molecules for autism. Zebrafish embryos were treated with valproic acid and a battery of behavioral tests (anxiety, inattentive behavior, irritability and social impairment) was performed on larvae at 7th day post fertilization, followed by study of molecular markers of autism. This model shows a significant behavioural impairment in valproic acid treated larvae in comparison to control which was again supported by alteration in few marker genes and proteins of autism. The model also shows a rescue of behavioural despair with positive control drugs. The model shows robust parameters to study behavior, molecular mechanism and drug screening approach in a single frame. Thus we postulate that our 7 days zebrafish larval model for autism can help in high throughput screening of new molecules on autism.

Keywords : autism, zebrafish, valproic acid, neurodevelopment, behavioral assay

Conference Title : ICND 2018 : International Conference on Neurodevelopmental Disorders

Conference Location : Sydney, Australia

Conference Dates : December 03-04, 2018