

Visegrád Group Society for Developmental Biology: Inaugural Meeting



PROGRAM & ABSTRACTS

7th - 9th September 2018, Brno, Czech Republic

Program

SESSION 3		Chair: A.W. Bruce
15:30-15:35	Tetkova Anna	FSH influences amino acid incorporation in mammalian oocyte and early embryo
15:35-15:40	Machacova Simona	Evolution of gene network regulating gastrulation: Insights via <i>Chordin</i>
15:40-15:45	Stachowiak Anna	Differentiation potential of rabbit inner cell mass
15:45-15:50	Winiarczyk Dawid	<i>SIRT1</i> may control apoptosis resistance in preimplantation mouse development
15:50-15:55	Knop Filip	<i>Caenorhabditis elegans</i> SEL-5 kinase role in anterior-posterior cell outgrowth and migration
15:55-16:00	Henry Surya	Characterization of cardiac transcription factor PLAGL1, a newly identified putative downstream target of RYBP
16:00-16:05	Kovacs Tamas	Intraganglionic macrophages: a new population of cells in the enteric ganglia
16:05-16:10	Drozdova Angelika	Development of melatonin rhythm in the pineal gland of chick embryos incubated under different wavelength of light
16:10-16:15	Pejtsik Diana	Early-life social isolation-induced serotonergic deficits and their behavioural consequences in zebrafish (<i>Danio rerio</i>)
16:15-16:20	Zietek Marta	Effect of advanced maternal age on reproductive outcomes in a mouse model of autism
16:20-16:50	COFFEE BREAK	

Early-life social isolation-induced serotonergic deficits and their behavioural consequences in zebrafish (*Danio rerio*)

Diana Peitsik¹, Zoltan Kristof Varga^{1,2}, Aron Zsigmond³, Laszlo Biro¹, Kornel Demeter¹, Eva Mikics¹, Blanka Toth⁴, Vilmos Salamon¹, Mate Varga³ and Mano Aliczki¹

¹ *Laboratory of Translational Behavioural Neuroscience, Institute of Experimental Medicine, Hungarian Academy of Sciences, Budapest, Hungary*

² *János Szentágothai Doctoral School of Neurosciences, Semmelweis University, Budapest, Hungary*

³ *Department of Genetics, Eötvös Loránd University, Budapest, Hungary*

⁴ *Department of Inorganic and Analytical Chemistry, Budapest University of Technology and Economics, Budapest, Hungary*

Disturbed social environments, e.g. parental neglect in childhood, serve as risk factors for developing psychiatric disorders. Social neglect can be modelled in rodents, employing social isolation in a critical developmental period, when the brain is most amenable to changes. However, despite its numerous advantages, similar models have not been developed in zebrafish. Here we aimed to develop a model of social neglect based on the isolation of zebrafish in a critical developmental period we previously characterised. We found that isolated fish displayed decreased reactivity in the Light-Dark Test compared to socially-housed control. Interestingly, these changes were specific to the Light-Dark Test, since in other tests measuring different domains of avoidance behaviour, isolation resulted in increased responsiveness. Furthermore, whole-brain serotonin content analysis revealed lower basal levels in isolated animals, which swiftly increased to acute stress, as opposed to the long-lasting decrease in socially-reared animals. Immunohistochemical analysis of serotonin showed that this difference appeared in brain areas homologous to the mammalian hippocampus and amygdala, involved in the regulation of avoidance behaviour of zebrafish. To assess possible causal relationships between elevated serotonergic activity and behavioural changes of isolated animals, we pharmacologically dampened 5-HT signaling using 5-HT_{1A} partial agonist buspirone. Buspirone treatment abolished isolation-induced increase in forebrain serotonergic activity along with behavioural changes in Light-Dark Test. Taken together, social isolation in the critical period changes the way zebrafish respond to challenges by disrupting the same neuromodulatory system described in higher vertebrates, allowing for further use of this model in developing treatment for psychiatric disorders.

Acknowledgement: This project was supported by the Hungarian Genetics Society in the form of a travel, and accommodation grant, which enabled me to attend this conference.