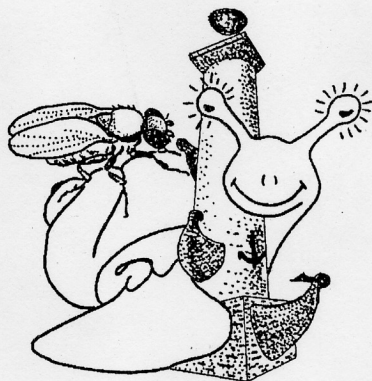


SIMPLER NERVOUS SYSTEMS

IX East European Conference
of the International Society for Invertebrate Neurobiology

St. Petersburg, Russia
September 9–13, 2009

A B S T R A C T S



ПРОСТЫЕ НЕРВНЫЕ СИСТЕМЫ

IX Региональная конференция
Международного общества нейробиологии беспозвоночных

Санкт-Петербург, Россия
9–13 сентября 2009 года

ТЕЗИСЫ ДОКЛАДОВ

EXPRESSION OF SEROTONIN RECEPTORS DURING EARLY EMBRYOGENESIS

D. A. Nikishin¹, E. G. Ivashkin², A. S. Mikaelyan³, Yu. B. Shmukler¹

¹Group of Embryophysiology

²Laboratory of Comparative Physiology

³Laboratory of Molecular and Genetic Mechanisms of Ontogenesis

N. K. Koltzov Institute of Developmental Biology

Russian Academy of Sciences

Moscow, Russia

E-mail: yurishmukler@yahoo.com

Early embryos during cleavage divisions are the simplest model of cellular interactions. The "protosynapse" concept elaborated in sea urchin early embryos suggests the existence of double-side symmetric structure for intercellular signal exchange that may be laying the basement for further development of classic mechanisms in adults. Neurotransmitters can act as signal molecules in such interactions proved by their ability to imitate related effects in early embryos. At the same time the data on the expression of the neurotransmitter receptors during early development are either poor or absent at all.

The expression of serotonin receptors in mouse *Mus musculus* and zebrafish *Brachydanio rerio* early development has been studied. To obtain working cDNA library SMART PCR method for small amounts of the original RNA was used with 200 two-cell mouse embryos. Using PCR the presence of 5-HT_{1D}-receptor mRNA in two-cell mouse embryo was shown and confirmed by sequencing of the reaction products. Using RT-PCR and sequencing the expression of 5-HT_{1A}-receptors in early *B. rerio* development (cleavage divisions, blastula, epiboly, and neurulation) also was shown. Relative amount of 5-HT_{1A}-receptor mRNA decreases during development (to epiboly stage) and raises again at the neurulation stage. On the contrary, expression of predicted 5-HT_{3A}-receptor sequence in zebrafish first occur at the neurulation stage only.

Thus, the expression of serotonin receptors during early development was confirmed in mouse and first demonstrated in zebrafish. This data support our earlier suggestion on the existence and functional significance of the processes in preneurogenesis in which neurotransmitters take part.