



In the future, we would like to analyse the role of miR-138 in heat stress in PGCs as well as its role in controlling the self-renewal and pluripotency.

Keywords: *Primordial germ cell, heat stress, HSP70, miR-138*

O-50

BALANCING EARLY AND LATE NEURAL PROCESSES BY POLYCOMBS

Gergő Kovács, Enikő Sutus, Viktória Szabó, Melinda Katalin Pirity

Biological Research Centre, Hungarian Academy of Sciences, Szeged, Hungary

Polycomb (PcG) proteins have essential role in diverse developmental processes. We have previously reported that the PcG protein Rybp (Ring1 and Yy1 Binding Protein) is essential for embryonic development and that decreased dosage of Rybp in the heterozygotes can also lead to perinatal embryonic lethality due to exencephaly. However the precise molecular mechanism of Rybp action is still under major debate.

In current work, we utilized wild type (*rybp*^{+/+}) and *rybp* null (*rybp*^{-/-}) mutant ES cells and differentiated them towards neural lineages *in vitro* using retinoic acid (RA) in order to uncover underlying molecular events that are responsible for the *in vivo* phenotypic changes. We found that the kinetics of neural differentiation was disturbed in the absence of Rybp. Our results showed that early neural processes took place in a greater extent in the mutants and absence of functional Rybp resulting dramatic decrease in the formation of terminally differentiated cell types (neurons, glia). We also found indications for possible interaction between Rybp and specific PRC2 (Polycomb repressive complex 2) and nBAF (neuron specific Brg1-associated factor or SWI/SNF-like) complex members during neural differentiation. Furthermore, lack of *rybp* coincided with the altered gene expression of the RA pathway members and key neural transcription factors including Pax6 and Zac1 pinpointing a possible transcriptional regulation circuit among Rybp and these genes.

Together, these findings show that Rybp plays critical role in balancing between early neural processes and late stage of neural differentiation, and it is indispensable for proper neural lineage commitment. Finally, manipulating the expression of self-renewal and differentiation target genes can be beneficial in driving differentiation for therapeutic uses of stem cells.

This work was supported by GINOP-2.3.2-15-2016-00001 and GINOP-2.3.2-15-2016-00039.

Keywords: *Rybp, polycomb, neural differentiation, retinoic acid*