

## POPULAR SCIENCE SUMMARY FOR PUBLIC

According to the statistics, number of infertile couples in reproductive age is estimated up to 15% worldwide. Approximately, 50% of all infertility cases are associated with male factor. These numbers are alarming and encourage researchers to perform enhanced surveys of processes leading to spermatozoa formation. Current knowledge about genetic background of male infertility is fragmented and diagnostic procedures are still not enough sensitive and accurate, which negatively influence specifying the proper diagnosis. The obstacle hindering studies of gametogenesis is lack of well-established model, which allows investigation of spermatogenesis *in vitro*. Nowadays, thanks to stem cell technology and its potential to obtain multiple lineages, research concerning investigation of processes leading to the formation of germline are being conducted in few scientific institutions worldwide.

Proposed project is focused on investigation of *RBMXL3* gene encoding an RNA binding protein, which potentially plays an important role in human spermatogenesis. So far, function of this protein was not studied and described. There are numbers of evidence indicating that proteins from RBM family are involved in gene expression regulation during differentiation and establishment of germ cells and mutations in these genes negatively affect fertility.

The main goal of proposed research is to reveal the pool of genes regulated by *RBMXL3* by utilisation of cutting edge technology: eCLIP-seq in human *in vitro* seminoma model. In addition, we propose to analyse changes on RNA level caused by *RBMXL3* in unique *in vitro* model of primordial germ cells obtained from human embryonic stem cells. Potential results may allow us to uncover the function of *RBMXL3* gene in the context of spermatogenesis and take a step closer to answer the question, if mutations in this gene might be responsible for impairment of sperm cell production, which may lead to infertility.