DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Infertility is a problem, which affects many individuals worldwide, as well as in Poland. The proposed Project will make an important contribution to science, since infertility affects about 14-15% of couples in reproductive age, and male factor accounts for about half of these cases.

The male infertility may be an outcome of a number of irregularities occurring during the spermatogenetic process. The regulation of spermatogenesis depends on the cooperation of hormonal, genetic and environmental factors, therefore dysfunctions in one of these factors can lead to azoospermia (the absence of spermatozoa in ejaculate). The causes of nonobstructive azoospermia can be complex and the current andrological diagnosis is not sufficient. Especially the genetic causes are still not well recognized. **Therefore, we will analyze two novel genes *DDX53* and *RBMXL3* (unique for human),** which potentially could be involved in spermatogenesis impairment in azoospermic men.
The main aim of this **Project is to establish novel, an in vitro disease-relevant model of spermatogenesis** which can be applied as a tool for evaluation of genetic causes of male infertility. This will be achieved basing on stable human cell line with primordial germ cell characteristic (TCam-2) and human induced pluripotent cells (iPSC) differentiation towards male germ cells. Generation of in vitro disease-relevant model of spermatogenesis and molecular innovative technology (RNAseq, RIP-seq, ChiP-seq and Co-IP-MS) will disclose the functional role of *DDX53* and *RBMXL3* genes and to answer if the identified mutations in these genes in azoospermic men could be the reason of their infertility.