Male infertility affects about 7% of men. Azoospermia (lack of spermatozoa in semen) is being observed in approximately 1% of total male population and increases to the value of 10-15% in males with infertility. Its seems to be very alarming, especially in the light of low demography in the developed countries. Diagnostics of oligo- and azoospermia is complex. However, beside standard seminological analysis, hormonal evaluation and karyotyping it has to be emphasized that in a great number of cases the observed disturbances indicate molecular level of infertility and such standard analyses would be insufficient. This also reflects poor understanding of the molecular mechanisms underlying spermatogenesis and fertilization.

In about 50% of azoospermia cases the etiology is inknown (idiopathic). Thus, there is an urgent need to define the causes of observed disturbance, especially in the fact that those patients may have children conceived by artificial reproductive techniques using testicular spermatozoa. There is also a possibility that in the majority of these cases, unknown genetic anomalies can be transmitted to the offspring.

We anticipate that this project should identify or confirm several novel candidate genes underlying severe oligozoospermia, cryptozoospermia and azoospermia. We are going to generate a 'knockout' mice models (mice with disabled genes) to confirm the significance of selected mutations. This information would also lead to understand how this novel gene functions and why the gene mutations cause the decrease of sperm count in males leading to infertility. Additionally, results obtained should answer the question about possible spermatogenesis differences also in siblings. Thus, we will propose a systematic investigation of oligo/azoo-associated genetic defects in males, which will provide insight into the molecular basis of male infertility. Ultimately, results obtained in this project will facilitate the development of new diagnostic procedures, leading to greater improvement of the prognosis for assisted reproductive medicine where the risk of transmitting of genetic defects to offspring is of a great concern.