ID: MSCA-19-Goossens01

Discipline: Embryology and Genetics

Title: Investigating and understanding male infertility – the biology of the testis

Abstract: In Europe, at least 20% of young men exhibit sperm parameters below the lower WHO reference level and this affects their fertility. Only for a small fraction of these patients, the cause of their infertility can be diagnosed, but in most infertile men, the reason for their infertility is unknown. Techniques are available to retrieve sperm from patients with oligozoospermia from semen and in case of obstructive azoospermia by microsurgical epididymal sperm aspiration or testicular sperm extraction. The sperm may then be used for assisted reproductive technologies such as in-vitro fertilization or intracytoplasmic sperm injection. However, for men with non-obstructive azoospermia or prepubertal patients at risk for fertility loss (e.g. boys needing gonadotoxic cancer treatments), there are currently no therapeutic options available to father their genetically own child. The spermatogonial stem cell (SSC) is the driving force behind spermatogenesis. Loss or dysfunction of SSCs results in male infertility. In cases where SSCs are the only germ cells present in the testis, in vivo or in vitro strategies based on sperm development from SSCs should be established. However, if no germ cells are present, induced pluripotent stem cells from the patient’s somatic cells will be the only option from which to develop their own sperm. To develop these potential therapies is a huge task, because it requires detailed understanding of the entire process of sperm production from stem cells to functional sperm, and the regulation of each step in this process. Our current research aims include the following studies: regulatory processes during germ cell maturation; mechanisms that lead to Klinefelter-related infertility; the development of a 3D culture system for human in-vitro spermatogenesis, and the implementation of novel developments into the clinic.

Supervisors: Ellen Goossens, Ellen.Goossens@vub.ac.be

Website: http://emgebite.vub.ac.be/

To apply: https://www.vub.ac.be/en/european-liaison-office#apply-msca-if