

## ***In vitro* maturation of spermatogonial cells by growth factors and hormones**

**Prof. Mahmoud Huleihel**, the Department of Microbiology & Immunology,  
Ben-Gurion University of the Negev, Israel

### **Technology**

Aggressive chemotherapy / radiotherapy in childhood often results in testicular damage and jeopardizes future fertility. Prof/ Huleihel and his team invented a method for *in vitro* maturation of spermatogonium, comprised from culturing of spermatogonium in a 3D methylcellulose culture system (MCS) in a culture medium. The culture medium contains either an optimized medium for human cells, capable of *in vitro* maturing the spermatogonium. The technology was tested in seminiferous mice cells, that were isolated and cultured with testosterone combined with GM-CSF, which demonstrated induction of the post-meiotic cells.

### **Application**

This novel method includes *in vitro* maturation of spermatogonium from a patient, thereby generating mature sperm cells. The generated sperm could be used (by assisted reproductive techniques) to fertilize oocytes. Combining studies from mice cells, the findings may assess better understanding of the mechanism involved in the regulation of spermatogenesis *in vitro* and *in vivo*. May be used as part of fertility treatment for adult non-obstructive azoospermia, who are sperm less due to failure of spermatogenesis, or had chemotherapy/radiotherapy without cryo-preservation of sperm samples.

### **Advantages**

- Allowing prepubertal or other males who cannot produce mature sperm to preserve sperm.
- Preventing the possibility of the presence of residual cancer cells, which may restore and evoke the disease after auto-transplanting.
- Increasing sperm quantity and preserving its quality.
- Can be used as additional treatment in Intrauterine Insemination (IUI) and increase success, as a step before IVF.
- These survival cells may also develop *in vivo* and recover spermatogenesis in the cured patient after puberty.
- Suggested as a novel treatment for children.

### **Patents**

[WO 2019/035070 A1](#); [WO 2021/161322A1](#)