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DEVELOPMENT OF A RAT AND HUMAN IN-VITRO MODEL FOR THE INVESTIGATION OF TESTICULAR TOXICITY

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Purpose: Male fertility has dropped considerably in all industrial countries over the past decades. It is estimated today that male production of spermatozoids decreased by 50 % during the past 50 years, mainly due to environmental factors. Existing models to predict the potential for chemicals to cause reproductive toxicity rely on animal tests that require the use of numerous animals (mainly rodents) which is less and less appreciated and is sometime not predictive enough. In this context, new experimental models are needed to reduce and replace the number of animal used with human-derived models. **Methods:** We are currently developing an in-vitro rat and human testis model based on the culture of isolated seminiferous tubules (organotypic culture) or on 3D testis engineered tissues from dissociated cells. We are using an air-liquid interface approach that takes advantage from both, the access to nutrients with the contact with culture medium, and proper oxygenation of the growing tissue with the air interface. The organotypic culture aims to maintain the tissue structure as close as possible from in-vivo, while the dissociated culture aims to recreate a tubule-like structure from cell lineage that could be kept frozen before culture. **Results:** Preliminary results showed a good in-vitro survival of young rat tissue for more than 3 weeks both for the organotypic and dissociation approach. For human tissue, we kept dissociated cells alive for more than 2 weeks. These in-vitro models will be used to perform toxicological studies with reference toxic compounds such as Dioxin, Busulfan and Vinclozolin.