

Clinical Application of Spindle Nuclear Transfer on Poor Embryo Development

Cytoplasmic dysfunctions (essentially in mitochondrial, but not limited to) have been identified as major causes of poor oocyte quality and high aneuploidy rates in patients with sub-fertility disorders or advanced age. In the last years, our group has been studying the safety and potential of mitochondrial replacement therapies (MRTs) techniques to overcome infertility problems related to poor oocyte quality. Proof of concept experiments in mouse models showed that the maternal spindle transfer (MST) technique can overcome developmental arrest of poorly developing oocytes and that the resultant embryos can give rise to healthy and fertile animals with very low heteroplasmy. Furthermore, pre-clinical validations using human donor oocytes donated for research have also corroborated its effectiveness. At present, we are carrying out a clinical pilot trial that includes patients under 40 y/o with a history of several previous failed IVF attempts to determine whether MST is truly beneficial in the context of assisted reproductive treatment.