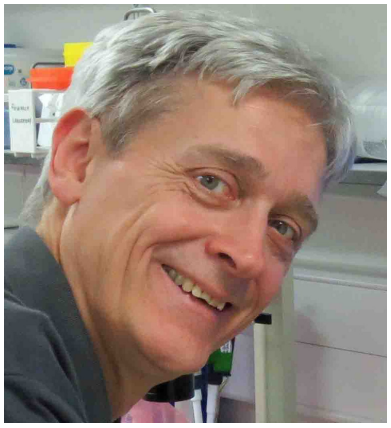
SPEAKER PROFILE



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I started as a chemistry undergraduate, became interested in cell adhesion as a postdoc and have
been for some years researching implantation and
placental development.
The lab's focus is mainly on human, though we keep an eye on comparative aspects of implantation biology. We have developed in vitro and ex vivo methods for the study of embryo-epithelial interactions, the trophectoderm-trophoblast transition and trophoblast invasion. We've become interested in the cascade of challenges presented to the embryo as successive waves of trophoblast attach to and locally displace the epithelium, invade the decidualising stroma and access maternal blood vessels. We hypothesise that there are selection pressures at all three of these distinct stages of early pregnancy – the enterprise may falter at any one of them.

LECTURE ABSTRACT: Implantation and Beyond

14:00 - 14:30

From the first contact with the endometrial surface, concurrent programmes are initiated for embryonic morphogenesis and placental development. The inner cell mass self-organises to generate spatially discrete epiblast and primitive endoderm compartments, and an amniotic cavity. Meanwhile, maternal cells trigger differentiation in trophoblast, beneath which there develops a supporting layer of extraembryonic mesoderm, leading to yolk sac and placental development and establishment of the crucial vascular link to the embryonic heart. Successive interactions with endometrial tissue layers -- epithelium, decidualising stroma and vasculature – impose progressive hurdles for the embryo to surmount. Stepped programmes of gene expression in trophoblast invoke biological responses underlying a highly sensitive negotiation that can either progress or fail at a multiplicity of early time points. Trophoblast lineage allocation is sensitive to environmental factors including osmotic stress and carbon supply, and a poorly supportive uterine cavity may advance the differentiation of invasive (hCG+) lineages; aneuploid mosaic embryos may thus sustain the corpus luteum long enough to allow time for recovery by selective expansion of euploid cells. In this light we face new challenges in selecting embryos for replacement.

Calls for permission to be extended to maintain embryos in vitro beyond the 14 day limit should be considered in the context of what might be achieved: is better basic understanding an acceptable goal in its own right? Is there an expectation that treatments will improve, or a need to reconsider how implantation should be defined in the context of ART and explained to patients?

Society for Reproduction and Fertility