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Multiparameter *in vivo* sensing platform for intra-uterine studies and subfertility diagnostics

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A wireless, battery-less, low power, multiparameter, in vivo sensing platform for intra-uterine studies is presented. In the developed world, more and more young couples are confronted with sub-fertility. Over 18% of the cases, no clear reason can be identified. It is suspected that abnormalities in the physiological parameters of the uterine environment have a significant influence on embryo implantation and development. Empirical studies on in vitro fertilisation have already confirmed that levels of pH and dissolved oxygen (DO) can inhibit growth and development of embryos, as well as implantation sucess rates. Hitherto, diagnostic capabilities to assess these parameters real-time, in vivo, are still lacking. A platform capable of measuring pH and DO onubtrusively, in vivo, over the course of one complete menstrual cycle will aid professionals in investigating the cause of sub-fertility, and help find a treatment for failure to conceive. The system consists of a minimal drift potentiometric Iridium oxide pH sensor and a low-power, transient operated, Platinum micro-electrode for the sensing of DO levels. An onboard silver-silver chloride electrode is used as a reference, contained in a biocompatible electrolyte. Both sensors are integrated into a single package, sized 4 x 4 mm for the sensor housing, with a possibility for future downscaling. For the first time, actual intra-uterine data on a day-to-day basis can be used to help couples achieve their dream.

Biography

Roel Mingels has completed his BSc Electrical Engineering degree at The Hague University. After a brief period at Hasselt University, IMOMEC's Biosensors group, he went on to obtain an MSc in Bioelectronics at the Unversity of Edinburgh. Currently, he is pursuing his PhD degree at the University of Southampton.

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