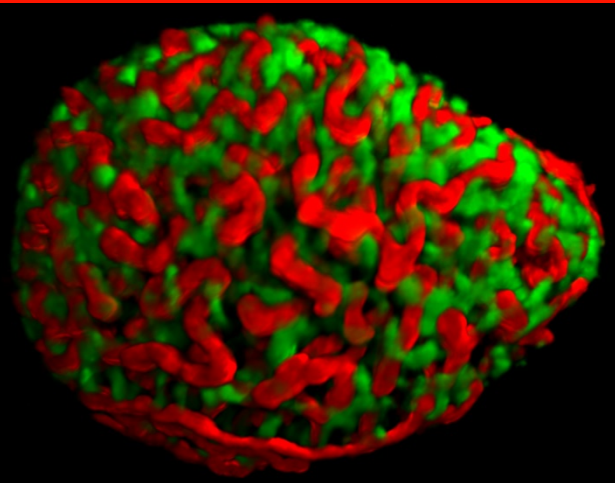
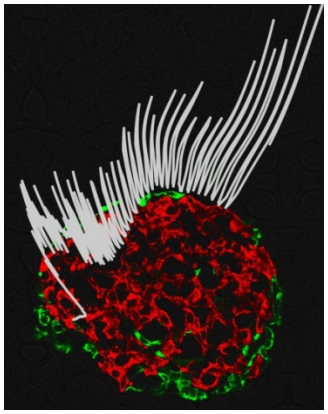
Micrometer-sized wireless fluorescence detection device

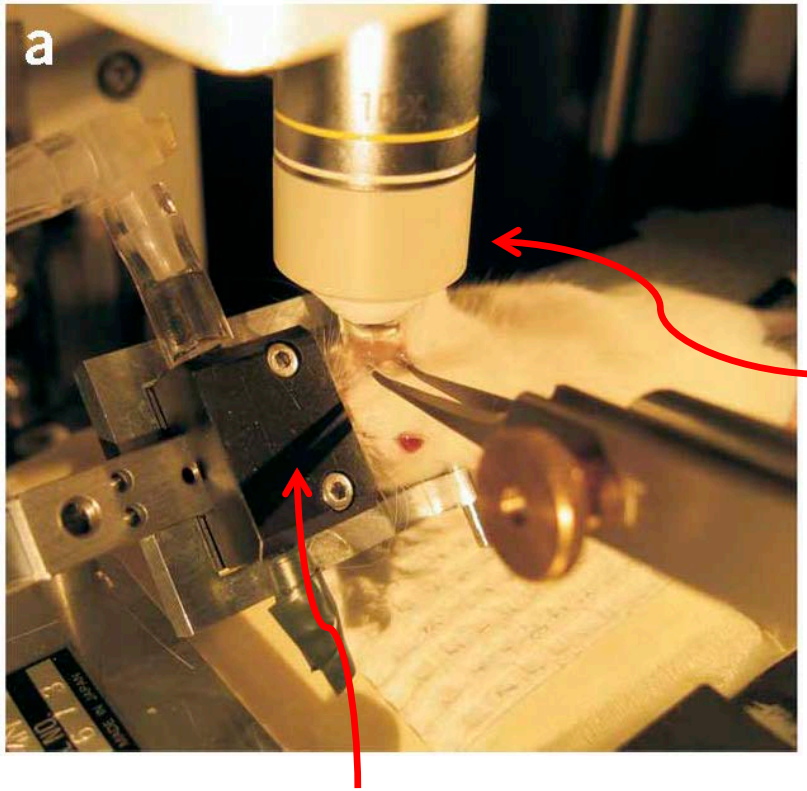
Martin Köhler, PhD
martin.kohler@ki.se

The Rolf Luft Research Center for Diabetes and Endocrinology
Department of Molecular Medicine and Surgery
Karolinska Institutet
Stockholm



- We are currently using fluorescence imaging to monitor cell function *in vivo*.
- One limitation is that animals need to be anaesthetized.





Big microscope for
in vivo fluorescence imaging

Anaesthesia

Unwanted effects of anaesthesisia when monitoring physiology in animals (and humans).

"Anaesthetic agents have a profound effect on the physiology of the animal and may thereby confound the image data acquired."

Example of concept of ”implantable cell-based biosensor” from published literature:

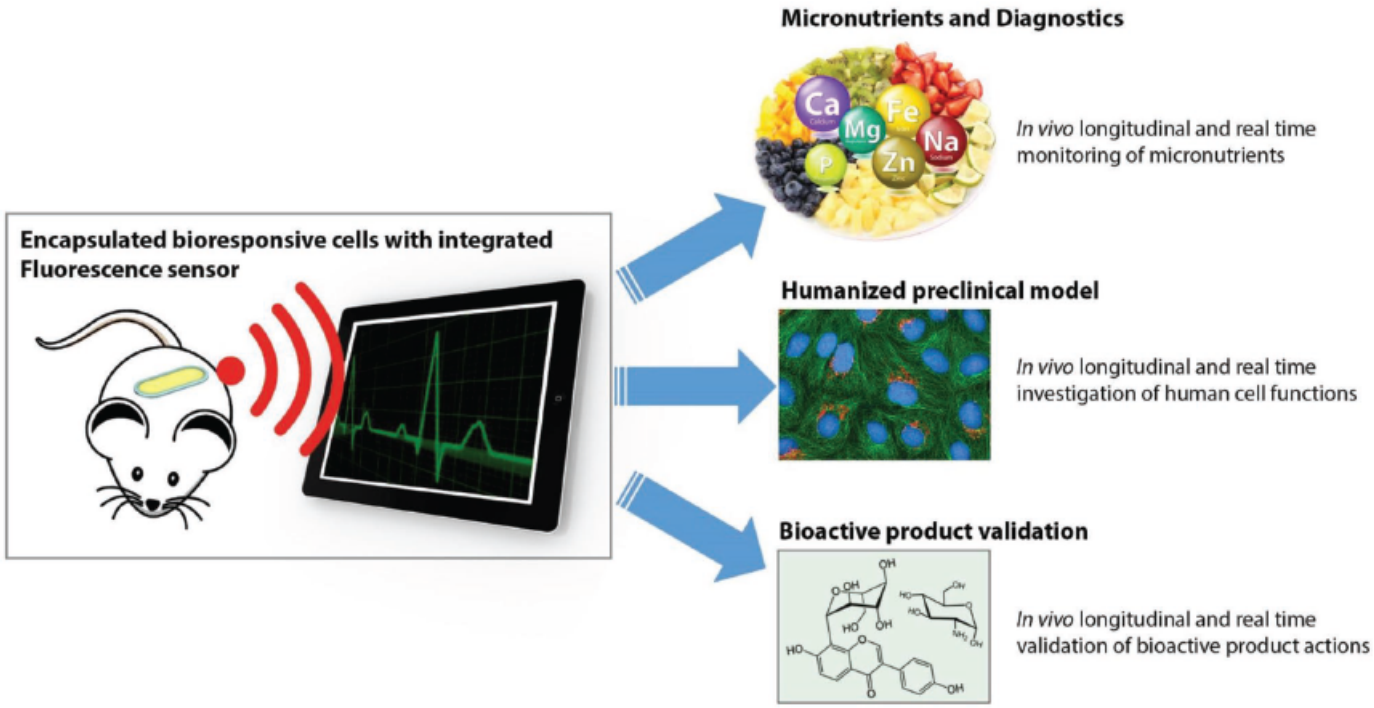


Figure 5. The development of implantable fluorescent cell-based biosensors could find numerous applications in biomedical research such as the in vivo longitudinal and real time monitoring of micronutrients, the investigation of human cell functions and the validation of bioactive product action.

Our goal: To develop a fully-implantable wireless micrometer-sized sensor device for dynamic health monitoring in diabetic and pre-diabetic patients.