



---

## An ingestible & implantable microsensor for the detection of blood in the intestinal tract

Technology in  
oncological surgery  
conference

Prof. Dr. Marc O. Schurr,  
Sebastian Schostek,  
Fabian Rieber

Naples, Italy  
April 18th 2008

Supported by the European Union as an Integrated Project  
Information Society Technologies - Contract Number 033970  
[www.vector-project.com](http://www.vector-project.com)

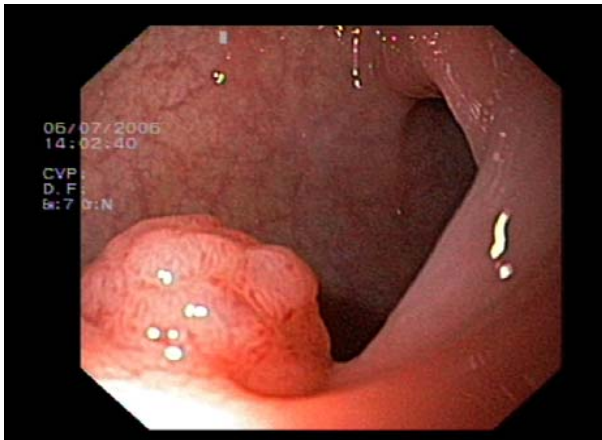


## Clinical background.

**Acute and chronic hemorrhage in the GI tract represent a relevant clinical problem. A new microsensor technology can improve the speed and precision of diagnosis.**

**Chronic lower GI bleeding in case of polyps and cancer**

**Detection of bleeding and location with ingestible sensor capsule**

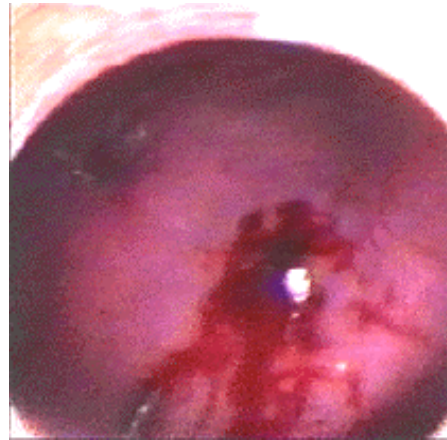


**Concept:  
Ingestible sensor**



**Acute upper GI bleeding in case of peptic ulcers or esophageal varices**

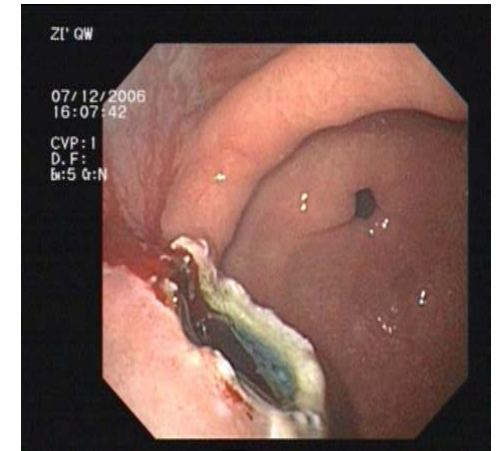
**Situation 1: Detection of suspected bleeding with ingestible sensor capsule**



**Concept:  
Ingestible sensor**



**Situation 2: Monitoring of relapse bleeding with implantable sensor capsule**

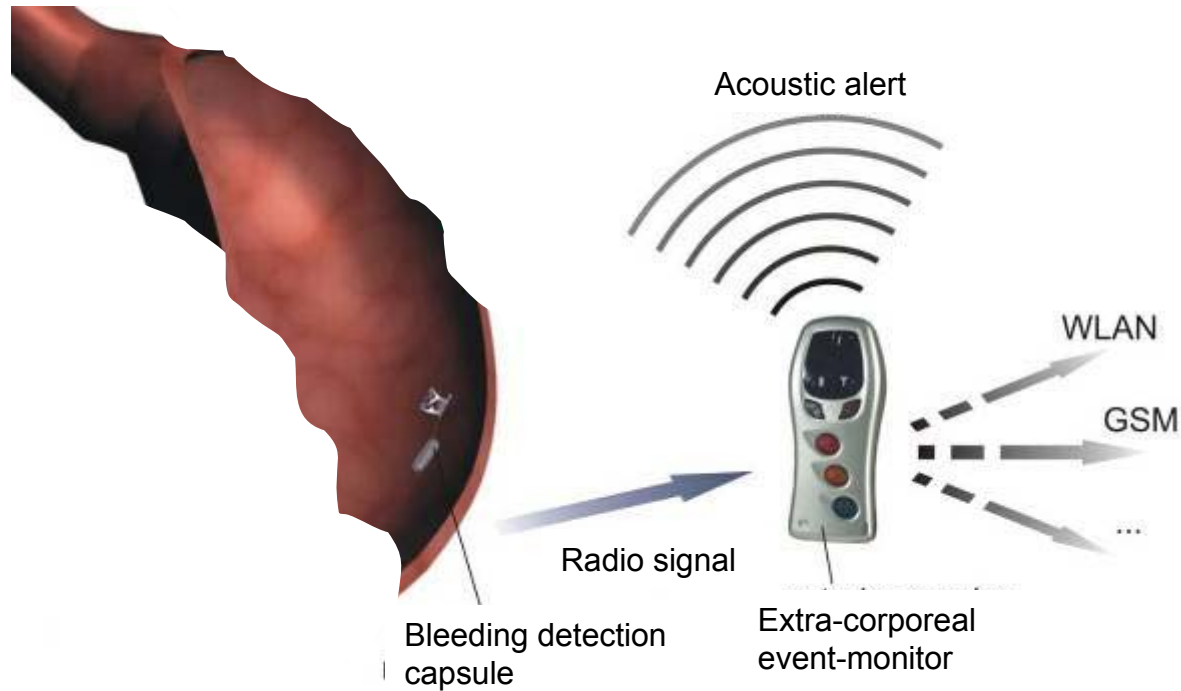


**Concept:  
Implantable sensor**



## Bleeding detection micro-sensor: system concept.

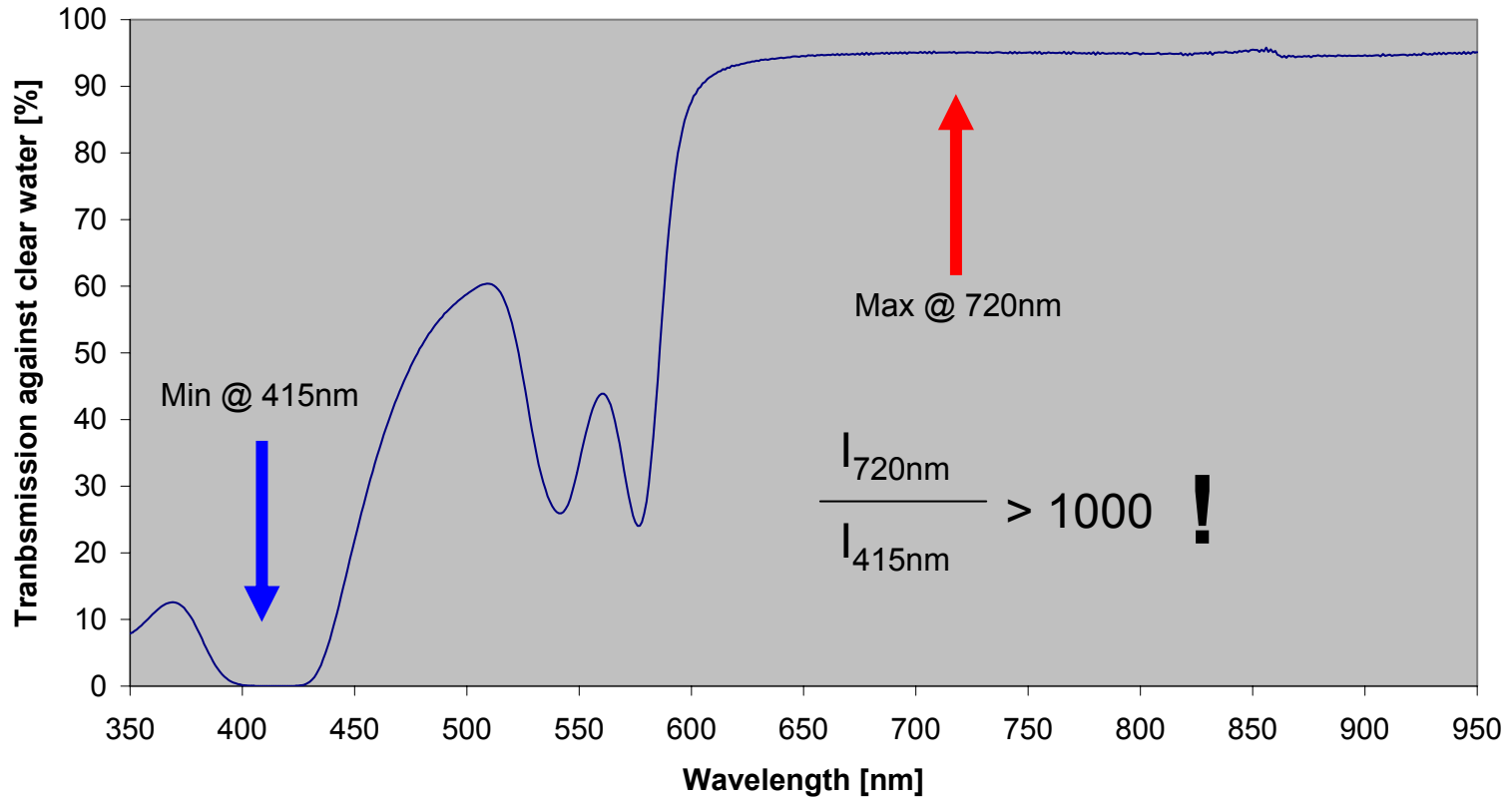
The system consists of the bleeding detection capsule and extra-corporeal event-monitor. Two variations: ingestible and inplantable versions of the micro-sensor capsule.



## Bleeding detection research.

The transmission spectroscopy of blood revealed that the transmission ratio between the wavelengths 415nm and 720nm is extremely high.

Transmission spectroscopy, 1% blood solution

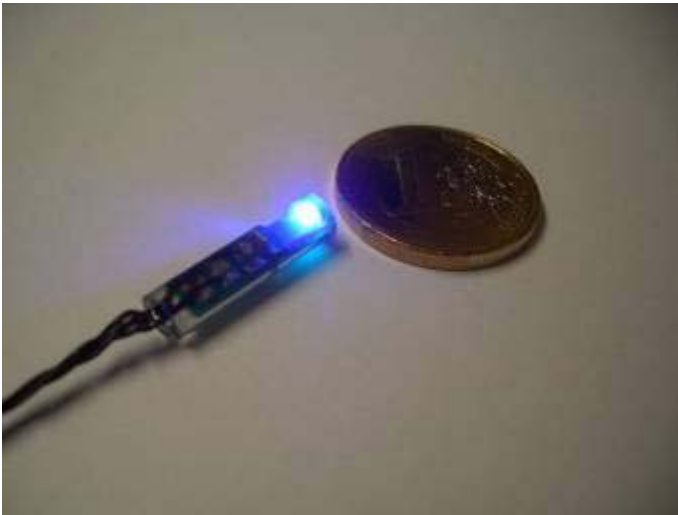


**Bleeding detection sensor.**

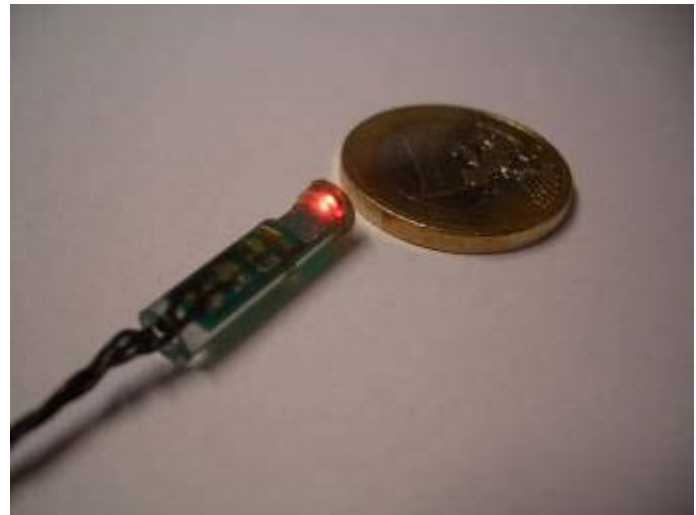
---

**Two LED's are used for optical detection.**

**Blue light (415nm)**

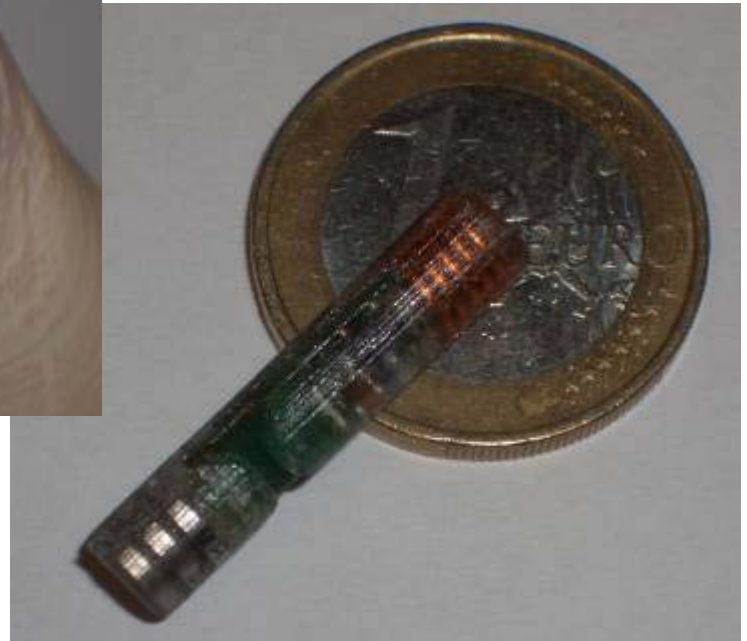
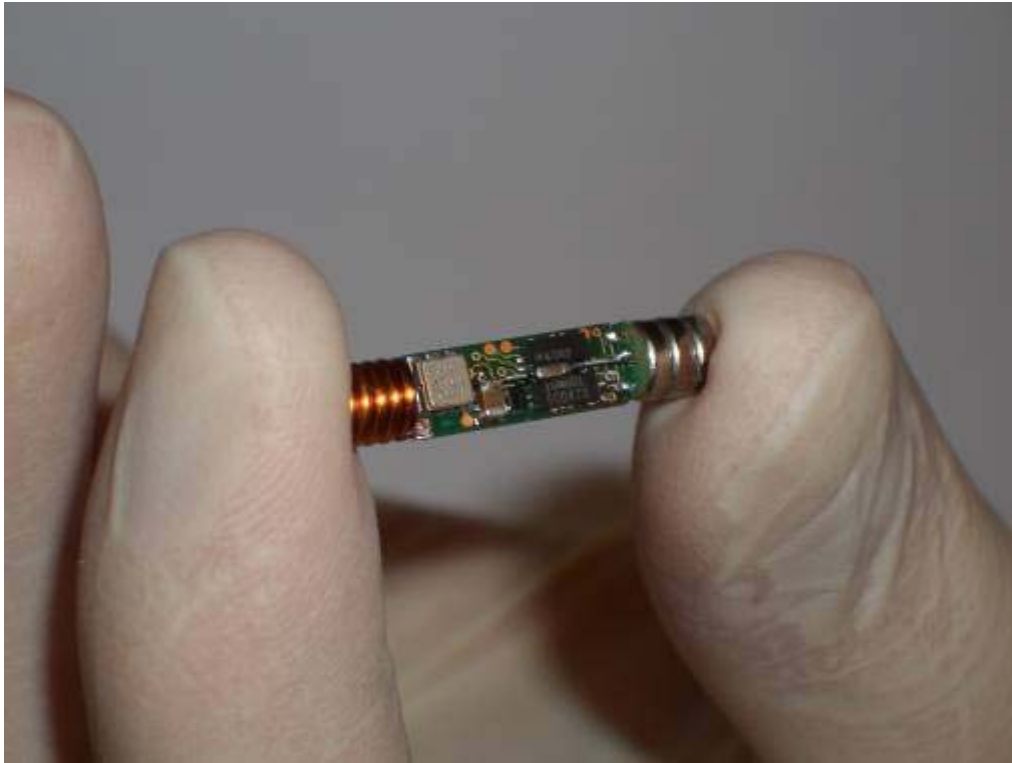


**Red light (700nm)**



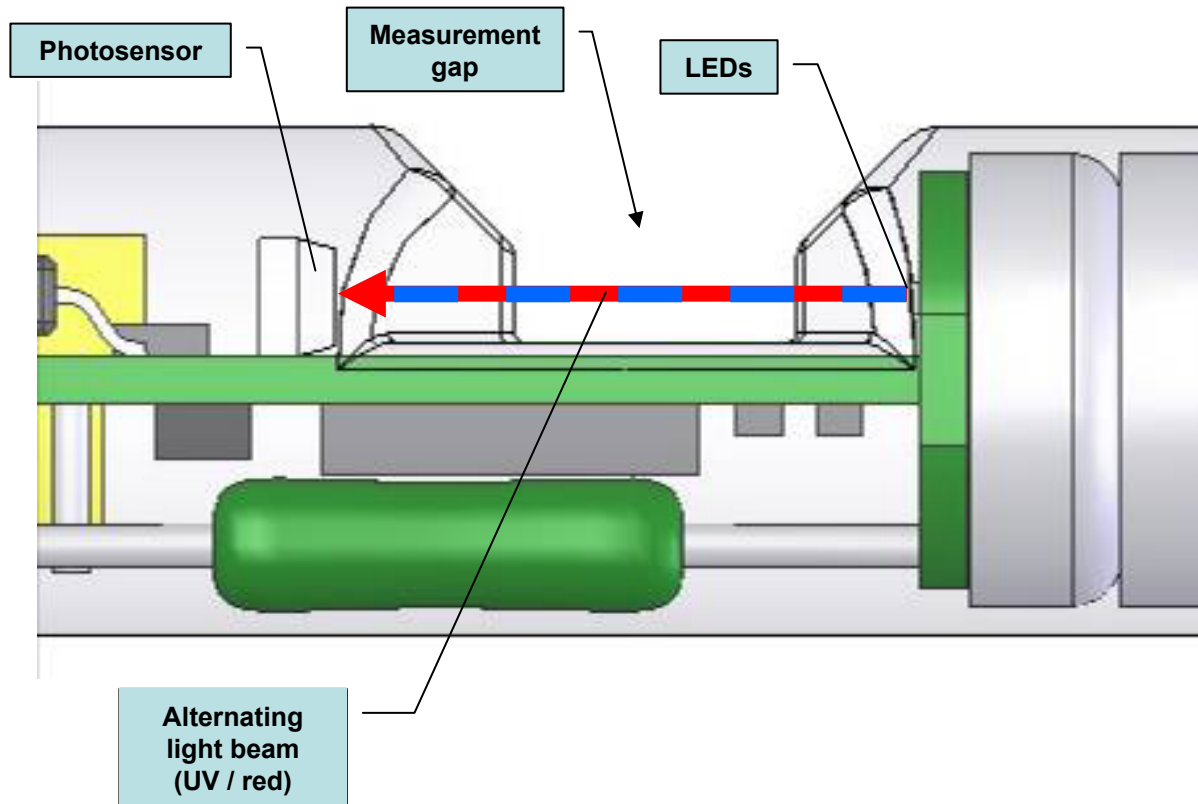
Sensor capsule prototype.

Prototype of an integrated, telemetric bleeding detection sensor capsule



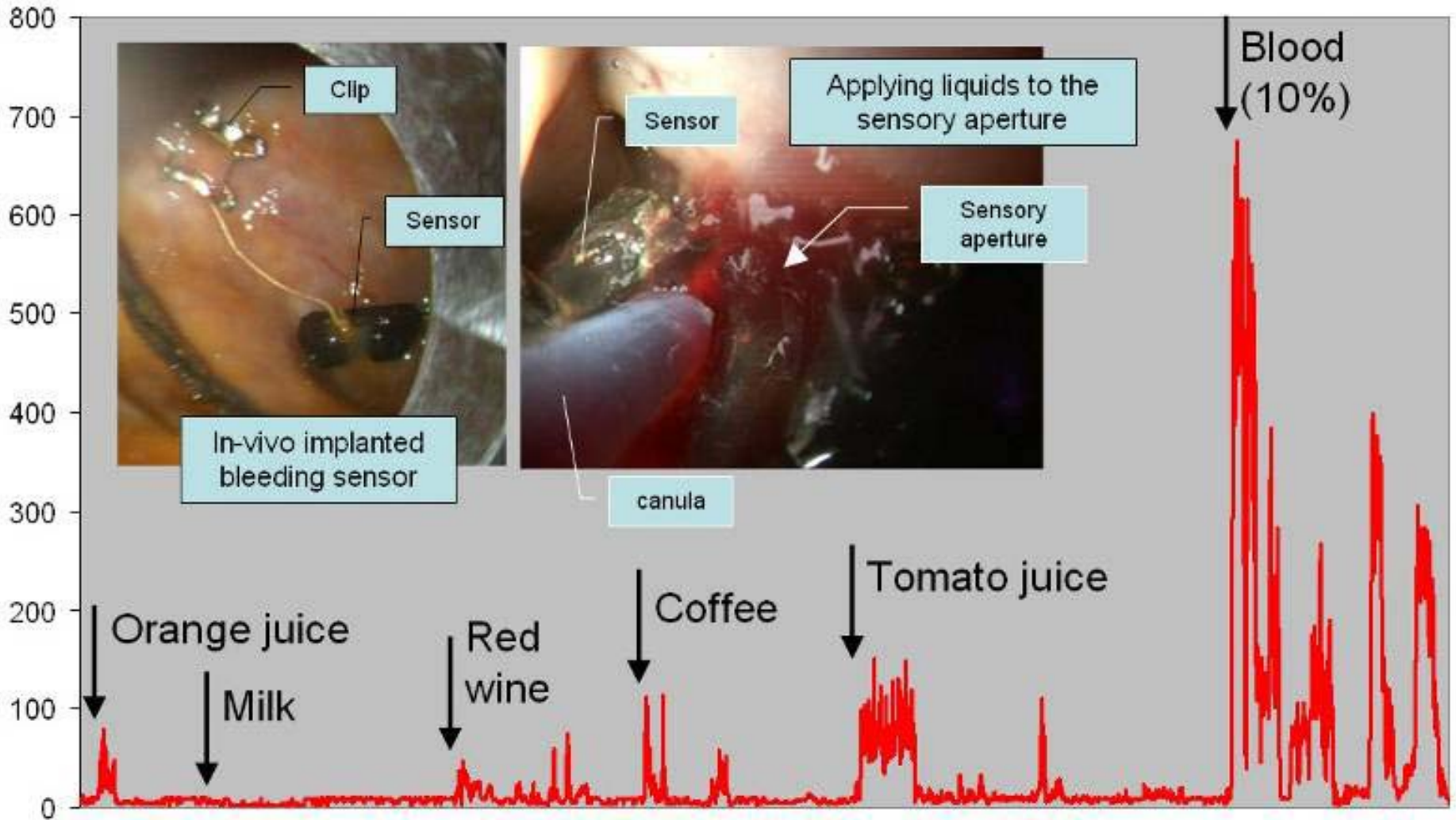
## Sensor capsule prototype.

The bleeding detection implant prototype optically detects blood content within a measurement gap by measuring the absorption of blue and red light.



## Bleeding detection research.

**Proof of principle: The sensor principle was successfully verified in-vivo.**



Annex.

---

## Contact.

In case of questions please contact:

**VECTOR project coordinator**  
**Prof. Dr. Marc O. Schurr**  
**novineon Healthcare Technology Partners GmbH**  
**Dorfackerstr. 26**  
**72074 Tübingen**

[marc.schurr@novineon.com](mailto:marc.schurr@novineon.com)

**+49-7071-7704515**

[www.novineon.com](http://www.novineon.com)

[WWW.vector-project.com](http://WWW.vector-project.com)