Project Outline

OCTmapp

Conception and Set-up of a Japanese Research Presence for Biomedical Applications of Optical Coherence Tomography (OCT)

November 21, 2017
Kick-Off Workshop, Wissenschaftszentrum Bonn

Dipl.-Phys. Niels König
Michael Witte
OCTmapp Kickoff Meeting
History of optical coherence tomography

Non invasive tomographic cross section images of semitransparent materials. Commerially available for ophthalmological diagnosis since 1995

Resolution and imaging depth between confocal microscopy and ultrasound imaging

OCT image of cornea (t.) and retina (b.)
Source http://www.opsweb.org/?page=ASOCT

Resolution
- Ex Vivo: 1µm
- In Vivo: 2-10µm
- 150µm
- 300µm
- 1mm

Imaging depth

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OCT: The missing link in gastrointestinal imaging?

In-vitro measurements

Normal colon mucosa

Gold standard: microscopic analysis of HE stained sections
OCT: The missing link in gastrointestinal imaging?

In-vitro measurements

Colon adenocarcinoma

2D OCT analysis 3D

Gold standard: microscopic analysis of HE stained sections

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Clinical Applications of OCT

Applications of Interest

- Surface Imaging
  - Ophtalmology
  - Dermatology
  - Dentistry
- Endoscopic Imaging
  - Eye-guided Surgery
  - Intra-operative Applications
  - Cardiovascular
  - Gynecology Urology
  - Neurosurgery
- Gastroenterology
- ENT
- Neurosurgery
- In-Vitro Applications
  - Point-of-Care Diagnostics
  - Lab-on-a-Chip

Research Applications

- Biology
- Pre-Clinical Applications
- Small Animal Imaging
Objectives

- OCTmapp
  - five year project sponsored by the German BMBF
  - two project phases: 1. development 2. consolidation

Main Objective:

- Build up a permanent research infrastructure and a research network in Japan
  - Focus area is Optical Coherence Tomography for new medical applications (e.g. intraoperative imaging, digital pathology)
  - Transfer from temporary to permanent operation of a self-supporting research facility at the end of the funding period
Planned Measures and Network Structure

Targeted facilities to be established:

- OCT Innovation Lab (Site of Research)
- OCT Competence Center for Medical Applications (Research Cooperation Unit)

will be financed by the acquired third party funds and also from R&D orders from companies and license revenues.

In addition will be established

- German-Japanese Biophotonic Research Alliance

for the integration of further partners.
Acknowledgement

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- Project supervised by the funding agency DLR