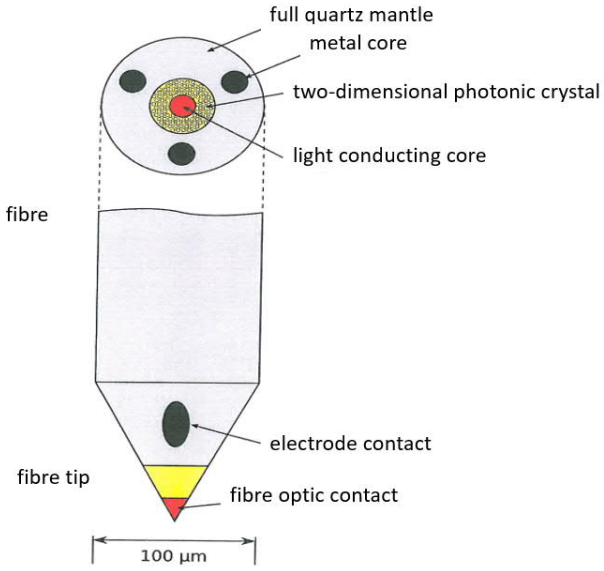
Integrated fibre optic microelectrode

neurosurgery, medical engineering

DESCRIPTION OF TECHNOLOGY AND PRODUCT

Fibre microelectrodes in general have been in use for several years and are used, for example, to measure neuronal interaction in the brain. They allow targeted and rapid control of precisely defined events in complex biological systems. Common fibre micro-electrodes consist of electrical conductors (wires) embedded in an insulator. Optical stimulation of neurons, which enables highly selective activation, opens up many new applications. However, common fibre microelectrodes are not suitable as light conduction.



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This new optical integrated fibre-optic microelectrode combines the advantages of a fibre microelectrode with those of an optical fibre to enable parallel optical and electrical signal conduction. Optical and electrical signals are conducted simultaneously, reliably and with low cushioning.

SCOPE OF APPLICATION

This innovation enables the optical stimulation of neurons. This opens up possible applications especially in the field of biomedical engineering and neurotechnology, e.g. high-resolution implants to restore vision or hearing.

AT A GLANCE …

Application Field

- implants to restore vision or hearing

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- medical engineering
- neurosurgery

USP

- optical and electrical signals are conducted simultaneously, reliably and with low cushioning

Development status

- prototype

Patent Portfolio

European Patent EP3216492C1 is granted.

Reference No.: TM906

ADVANTAGES COMPARED TO STATE OF THE ART

With this novel integrated fibre-optic microelectrode, light can be brought to a neuron and its (electrical) response simultaneously registered. The combination of both "worlds" by means of a novel integrated fibre-optic microelectrode (iFLM) is realised here for the first time and in an optimal way.

DEVELOPMENT STATUS

The development of a prototype for carrying out tests is performed. Currently, it is planned to carry out further feasibility studies.

MARKET

The hearing instrument manufacturers united in the European Hearing Instrument Manufacturers Association (EHIMA) sold about 14.12 million hearing instruments worldwide last year. The demand for modern technical hearing solutions is unbroken. Regular surveys show that there are still people living with untreated hearing loss, thus foregoing quality of life and accepting additional health risks.

OFFER

On behalf of University of Applied Sciences Giessen (THM), TransMIT GmbH is looking for cooperation partners or licensees for further development in Germany, Europe, the US and Asia.

A TECHNOLOGY OF

THM
TECHNISCHE HOCHSCHULE MITTELHESSEN

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