Press Release

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Isolation and neutralization cancer stem cells within a few minutes

IHP works on a new method which could help detecting brain tumours quicker than ever before

Frankfurt (Oder). To isolate cancer undifferentiated cells it takes currently months. Scientists at IHP – Innovations for High Perfomance Microelectronics in Frankfurt (Oder) are working on a technique to isolate and neutralise cancer stem cells (CSCs) within a few minutes. Together with a team of six partners, who are mainly biologists, they are aiming for a **S**emiconductor-based **U**ltrawideband **M**icromanipulation of **Ca**ncer **Ste**m **C**ells in the European Union Horizon 2020 project called "Sumcastec". "The targeted scientific breakthrough in Sumcastec is the world`s first micro-optofluidic lab-on-chip platform enabling successively cancer stem cells isolation via electromagnetic sensing and cell spectral signature identification, nanoscale imaging of targeted cells and their selective neutralization via electromagnetic radiations", explains Dr. Canan Baristiran Kaynak from IHP. With this new technique it might be possible to separate CSCs quicker than ever before. A new BiCMOS chip made by IHP shall help to detect and sort the cells. Thereby a novel micro-optofluidic lab-on-chip platform with full integration of microfluidic channels and reservoirs, broadband high frequency sources and detectors into a Silicon Germanium (SiGe) BiCMOS environment will be built up. This chip, which can be compared with a mini computer, should be able through high frequent electromagnetic waves to get inside of a cell without any damage. "Thus, it would be possible to get a more comprehensive view of the cell", says the IHP scientist. If it is possible to get in the inside, then the cell might be understood better and treatment can be sytonised. "With our technologies and systems used in medical engineering, we can contribute to new methods and practices, which help to treat illnesses better in the future", adds Prof. Bernd Tillack, Scientific Director of IHP.

The Sumcastec project, which has been started beginning this year and runs until mid 2020, would be the first crucial step in a long term vision focusing on the development of new electrosurgical tools for in vivo therapeutic targeting of CSCs, thus preventing recurrence and ultimately treating cancers such as Glioblastoma Multiforme and Medulloblastoma. It is also considered to be a very valuable project in terms of fundamental research: "We are proud that IHP takes part in a FET* project, since these calls fund only 2% of the submitted projects", explains Dr. Canan Baristiran Kaynak.

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Meeting at IHP: Every couple of months the group of scientists from Limoges University (France), University of Padova and Enea (both from Italy) as well as University of Bangor and Creo Medical are gathering. Last time they met in Frankfurt (Oder). © IHP 2017

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About IHP:

The IHP is an institute of the Leibniz Association and conducts research and development of silicon-based systems and ultra high-frequency circuits and technologies including new materials. It develops innovative solutions for application areas such as wireless and broadband communication, security, medical technology, industry 4.0, automotive industry, and aerospace. The IHP employs approximately 300 people. It operates a pilot line for technological developments and the preparation of high-speed circuits with 0.13/0.25 µm BiCMOS technologies, located in a 1000 m² class 1 cleanroom.

www.ihp-microelectronics.com

About Horizon 2010:

Horizon 2020 is the biggest EU Research and Innovation program ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.

https://ec.europa.eu/programmes/horizon2020/

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About *FET projects:

The Future & Emerging Technologies (FET) program invests in transformative frontier research and innovation with a high potential impact on technology, to benefit our economy and society.

FET provides a unique combination of high risk, long term, multidisciplinary and collaborative frontier research, which lays the foundations for radically new, next generation technologies. It converts proofs of concept into industrial applications and systems.

Under Horizon 2020, the EU's research & innovation funding program for 2014-2020, FET has an expanding role, forming part of the pillar of the program known as Excellent Science, and being open to all technology areas.

https://ec.europa.eu/digital-single-market/en/future-emerging-technologies-fet

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