

FAST-DOT

COMPACT ULTRAFAST LASER SOURCES BASED ON NOVEL QUANTUM DOT STRUCTURES



Project Number: 224338

Funding scheme: IP

Contact

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Web site

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Timeline

Start Date: 01/06/2008

End Date: 31/05/2012

Budget

Overall Cost: 13.659.296 €

Funding: 10.100.000 €

Vision

The vision of **FAST-DOT** is to revolutionise the use of lasers in the biomedical field providing both practitioners and researchers with pocket sized ultra high performance lasers at a substantially lower cost making their widespread use affordable.

The Objectives

Biomedical lasers currently in use are not portable and are heavy on energy consumption. This project will develop a new generation of lasers which will be much smaller and more energy efficient. The lasers will be designed for use in microscopy and nanosurgery where high precision cutting, imaging and treatment therapies will be made possible.

The new lasers will mean that surgeons and life scientists will have access to much higher performance and lower cost lasers than are currently available and will open up exciting new application areas for lasers in biomedicine.

The Approach

The project will use Quantum Dot technology to develop the new lasers. Quantum dots are based on novel semiconductor nanostructure clusters which demonstrate remarkable new photonic properties. Quantum Dot structures will afford major advances in ultrafast science and technology by exploiting the unique combination of Quantum Dot properties (high optical quality, efficient light generation, ultrafast carrier dynamics and broadband gain bandwidth) at a wavelength range which is not easily accessible with current technologies. The new Quantum Dot sources will be investigated and validated in a range of biophotonics applications including Optical Coherence Tomography, Nonlinear Microscopy, Nanosurgery and minimally invasive diagnostics/treatments.

Project Partners

- The University Of Dundee, UK
- INNOLUME GMBH, Germany
- The University Of Sheffield, UK
- Tampereen Teknillinen Yliopisto, Finland
- Eidgenoessische Technische Hochschule Zuerich, Switzerland
- Kungliga Tekniska Hogskolan, Sweden
- Institut De Ciencies Fotoniques, Fundacio Privada, Spain
- Foundation For Research And Technology – Hellas, Greece
- Alcatel-Thales III-V LAB, France
- Vilniaus Universitetas, Lithuania
- M-Squared Lasers Limited, UK
- Philips Technologie GMBH, Germany
- Technische Universitaet Darmstadt, Germany
- Toptica Photonics AG, Germany
- Time-Bandwidth Products AG, Switzerland
- Politecnico Di Torino, Italy
- National And Kapodistrian University Of Athens, Greece
- Molecular Machines And Industries Gmbh, Germany