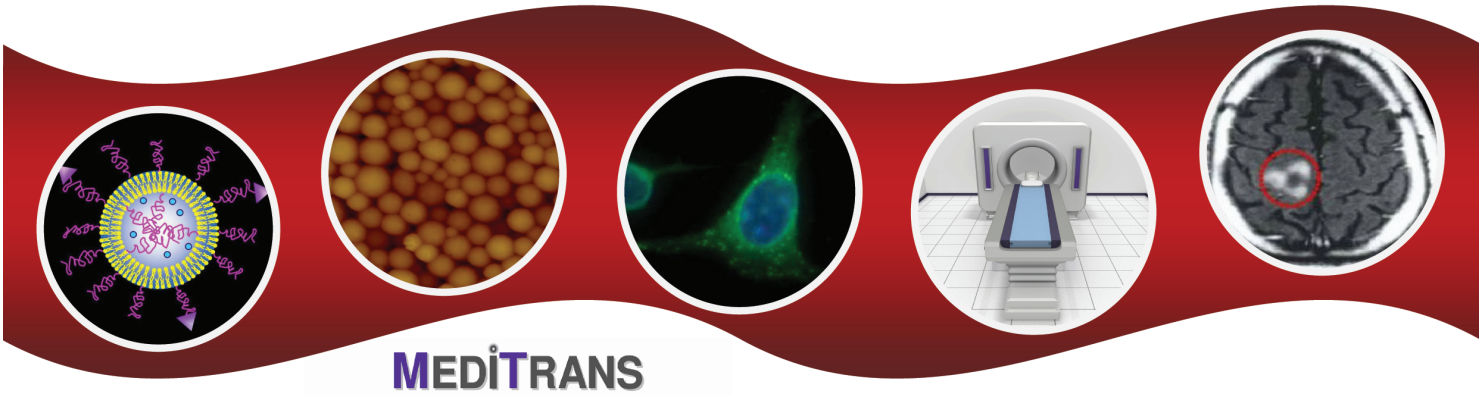

MEDITRANS

www.meditrans-ip.net

Targeted delivery of nanomedicine (2007-2010)

Consortium

Universiteit Utrecht
Commissariat À L'Energie Atomique
Magforce Nanotechnologies AG
Charite Universitatsmedizin Berlin
FOM
CSEM
PCI Biotech AS
Universiteit Gent
Uniwersytet Łódzki
N. V. Organon (part of Schering-Plough Corp.)
Technische Universiteit Eindhoven
Molecular Profiles Ltd
Universität des Saarlandes
Philipps-Universität Marburg
Bayer Schering Pharma AG
Across Barriers GmbH
Philips Electronics Nederland B.V.
Instituto di Richerche Biomediche A. Marxer SpA
Bracco Imaging SpA
Weizmann Institute of Science
Università Degli Studi di Torino
CSIC
Guerbet S.A.
University of Copenhagen
Forschungslaboratorien der Philips GmbH
Integrated DNA Technologies, BVBA
Universidad Nacional de Educacion a Distancia
Infuturia Group AG
Rijksuniversiteit Groningen
Universitair Medisch Centrum Utrecht

MEDITRANS represents a multidisciplinary Integrated Project dealing with targeted nanomedicines. Platform technologies will be developed with broad applicability to disease treatment, as exemplified by the choice for chronic inflammatory disorders (rheumatoid arthritis, Crohn's disease, multiple sclerosis), and cancer as target pathologies. Nanomedicines (based on carrier materials like polymeric and lipidic nanoparticles, nanotubes, and fullerenes) will be endowed with superior targeting and (triggerable) drug release properties. In parallel, MRI imaging probes will be designed that report on the localisation of the targeted nanomedicines, specific biomarkers, the drug release process and therapeutic outcome (imaging-guided drug delivery).

Project objective

To develop innovative targeted drug / imaging agent delivery, with controlled release and imaging guidance procedures for the detection of the underlying targeting / (triggered) drug release processes.

Specific challenges

Promote entry of targeted nanomedicines into industrial exploitation and clinical proof-of-principle studies.

Develop non-invasive imaging procedures for monitoring of targeted drug delivery processes.

Demonstrate potential of emerging materials (*e.g.* fullerenes) for use as drug carrier materials.

Expected impact

Well-characterised targeted nanomedicines with broad applicability to disease treatment (rheumatoid arthritis, Crohn's disease, multiple sclerosis and cancer).

Improved structural collaboration between industry and academia.

Images courtesy of:
1: Dr R. Schiffelers (UU), 2: Prof. Dr C.-M. Lehr (UDS),
3: Dr K. Fischer (BSP), 4: www.istockphoto.com,
5: The MRI brain image is from: Dousset *et al.* (2006).
American Journal of NeuroRadiology 27: 1000-1005.

NMP4-CT-2006-026668 – MEDITRANS
Targeted delivery of nanomedicine
Total cost I € 15 794 740 - EC Contribution I € 11 000 000
Project duration I January 2007 – December 2010 (48 months)
Project co-ordinator I Prof. Dr. Gert Storm – Utrecht University
Project managers I Dr. William Dawson / Mr. Seymour Kurtz – Infuturia Group AG
EC project officer I Dr. Marton Haraszti

The FP7 project MIMOMEMS - a contribution to the excellence of IMT Bucharest in Micro and Nanotechnologies

The FP7 project "European Centre of Excellence in **MI**crowave, **M**illimetre Wave and **O**ptical Devices, based on **M**icro-**E**lectro-**M**echanical **S**ystems for Advanced Communication Systems and Sensors" (**MIMOMEMS**, call REGPOT-2007-1-01, project No 202897, coordinated by Dr. Alexandru Müller (alexandru.muller@imt.ro) from **IMT-Bucharest** (**www.imt.ro**) has started on May 1, 2008. The main objectives of the project are: (i) Exchange of know-how and experience with twining partners (LAAS-CNRS Toulouse and FORTH Heraklion), (ii) Recruitment of incoming experienced researchers, (iii) Acquisition, development/upgrading of research equipment, (iv) Organisation of workshops and conferences, (v) Dissemination and promotional activities.

The overall aim of the MIMOMEMS project is **to bring the research activity in RF and Optical-MEMS at IMT Bucharest** to the highest **European level**.

After the first year of the MIMOMEMS project, the **Scanning Near field Optical Microscope (SNOM) (figure 1)**, the **up-graded to 110GHz set-up for "on wafer" S parameter measurements (figure 2) and the frequency generator up to 110 GHz** are already in use. An ongoing project in the national "Capacities" program has contributed to the infrastructure of the excellence centre with a **spectrum analyzer up to 110 GHz** and a **white light optical profiler** both working already in the microwave laboratory.

Recently other new technological and characterization equipments have been obtained by IMT, in the frame of national programs (the E-line Nano-engineering workstation for nanolithography, from Raith, the MA6 /BA6 mask aligner, a laser pattern generator, a thin film deposition system, a RIE machine, a high performance SEM, a XRD equipment, a SPM equipment). All these equipments are included in a new clean room environment, in the "**MINAFAB**" facility of IMT. MINAFAB is a center for research, for training by research and for services in micro and nano-system fabrication and characterization.

The main technical and scientific objectives supported by the MIMOMEMS project are: millimeter wave circuits based on silicon and GaAs micromachining; acoustic devices for GHz applications based on micromachining and nanoprocessing of wide band-gap semiconductors, polymer-based micro-photonic devices and sub-wavelength photonic structures

The new SAW (Surface Acoustic Wave) resonator structure manufactured on GaN/Si (cooperation IMT-Bucharest -FORTH Heraklion) was manufactured using the new nanolithography facility from IMT (fig 3). Fingers and interdigits 150nm wide have been obtained.The resonance was at 7 GHz.

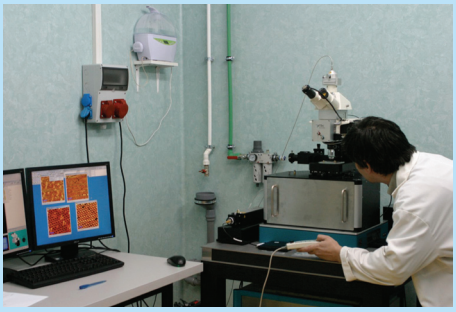

Fig 1: Measurements on the recent purchased SNOM equipment, in the MINAFAB facility.

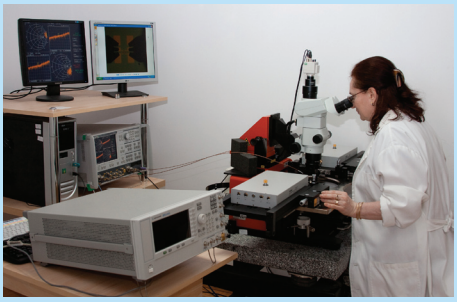

Fig 2: "On wafer" S parameter measurement set up during the upgrading from 65 to 110 GHz

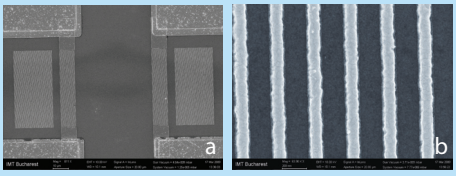

Fig 3: (a) SAW resonator manufactured on GaN/Si working at 7GHz; (b) detail of the IDT with fingers and interdigits 150nm wide, obtained by nanolithography in IMT

After the first workshop devoted to the MIMOMEMS project (**www.imt.ro/mimomems**), the second one (a strategic workshop in MEMS for applications in microwave and optical devices) will take place in October 2009 during the International Semiconductor Conference (CAS 2009), Sinaia, Romania (**www.imt.ro/cas**)

SEVENTH FRAMEWORK PROGRAMME