Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Trinity Translational Medicine Institute
Trinity Centre for Health Sciences

Collaborator/Funding Agencies

Key Enabling Technologies Nanomedicine

Representative Case Study — From bench to bedside. Key enabling technologies at TTMI.

Prof. Yuri Volkov and
Prof. Adriele Prina-Mello

The growing interest in the medical application of nanotechnology from academic and industrial researchers worldwide has led to the development of novel nanomedical platforms and nanodrugs, attracting substantial investments. Nanomedicine and its translation has evolved in recent years with enhanced sensitivity, safety and efficacy over existing diagnostic, treatment and combination strategies, resulting in clear benefits for the patient and society.

Prof. Yuri Volkov and Prof. Adriele Prina-Mello (TTMI Nanomedicine and Key Enabling Technologies group) are developing platforms in diagnostic, treatment and theranostic applications and have licenced a number of technologies to industry. In close collaboration with multinationals, SMEs and spinouts the group has been focused on screening, assessing and delivering the following:

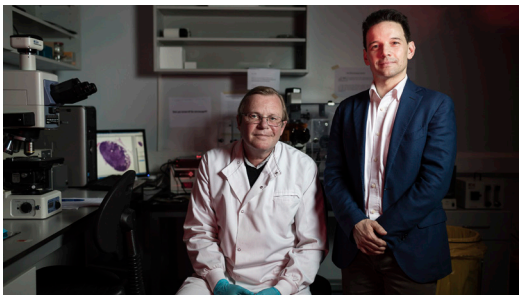
— Commercially exploitable solutions in cancer diagnostics based on second-harmonic generation nanocrystals licensed by NAMDIATREAM EC-FP7 project to TIBIO Sagl, (Switzerland)

— Commercially exploitable magnetic iron oxide nanoparticles for theranostics and magnetic hypethermia, commercialised by Liquid Research Ltd. (UK)

— Testing and validating new methodologies, instrumentation, devices for the biomedical industry

Prof. Yuri Volkov and Prof. Adriele Prina-Mello have pioneered the development of nanotechnological toolkits for multi-modal disease diagnostics and treatment monitoring (NAMDIATREAM project). As part of the MultiFun consortium, the group developed functionalised nanoparticles for early stage detection and treatment of breast and pancreatic cancer, where cancer stem cells are the key target. Additionally, Prof. Yuri Volkov and Prof. Adriele Prina-Mello are also involved in the Advanced Materials for Cardiac Regeneration (AMCARE) project.

TTMI is central enabling partner in the H2020 infrastructure project aimed at establishing the EU NanoMedicine Characterization Laboratory (EU-NCL), which partners with the US-NCL (as part of the National Cancer Institute) in the field of advanced characterisation, industrial translation and future market approval of nanomedical products.



Selecting Targeting Molecule

Pre-clinical Prototype Assessment and Validation

Healthcare Monitoring: Medical Device Development

Next Generation Nanomedicine and Theranostic products

1	2	3	4	5
1 Proven Imaging Contrast Agent Capabilities 2	Core and Multilayer Nanoparticle /Nanocarrier Testing and Selection 3	Screening for Smart Surface Coating 4	Effective Drug Selection	5 Safety, Quality and Efficacy screening

Enabling the increase of technology readiness level