THERATOOLS

Funded by the European Union

DC5 – Job Vacancy

Position Description	
Reference	DC5
Title of the project	Sono-responsive shuttle peptide-modified polymer/ceramic nanoparticles and their validation in 3D-bioprinted heterocellular tumor models
Recruiting Institutions	(1º) Technion – Israel Institute of Technology (Israel, 24 months) and (2º) University of Aveiro (Portugal, 12 months)
Secondment	Metatissue (Portugal)
Expected Start Date (estimated)	Latest July, if possible, February/March

Job Offer Description	
Keywords	
Project Description	This project aims to develop fine-tuned hybrid polymer/ceramic nanoparticles capable to cross the blood-brain barrier (BBB) endothelium and target glioblastoma (GBM) cells. For that, amphiphilic copolymers grafted with shuttle peptide will be synthesized and combined with titanium dioxide for the formation of nanoparticles with a size of 100-200 nm and sono-responsiveness. The nanoparticles could be also loaded with anticancer drugs to achieve synergistic activity. Finally, materials will be assessed in vitro using BBB models and GMB cells. Optimized prototypes will be tested in 3D models in the framework of a secondment in Metatissue (Portugal)
Objectives	- Production and characterization of hybrid nanoparticles of poly(ethylene oxide)-b-poly(propylene oxide) block copolymers and titanium dioxide surface-modified with shuttle peptides - Permeability of drug-free or drug-loaded hybrid nanoparticles of poly(ethylene oxide)-b-poly(propylene oxide) block copolymers and titanium dioxide surface-modified with shuttle peptides in an established model of blood-brain barrier in vitro - Advanced 3D-cell culture tumor models of brain tumors - 3D-Bioprinting of heterocellular tumor models of brain tumors containing cancer stem cells - Brain cancer cell compatibility, uptake and anticancer efficacy in vitro of shuttle peptide-modified hybrid nanoparticles of poly(ethylene oxide)-b-poly(propylene oxide) block copolymers and titanium dioxide
Expected Results	Shuttle peptide-modified hybrid nanoparticles of poly(ethylene oxide)-b-poly(propylene oxide) block copolymers and titanium

	dioxide will effectively cross a model of the blood-brain barrier and kill brain tumor cells upon irradiation with therapeutic ultrasound in vitro with respect to the unmodified nanoparticles
Supervisors	Prf. Alejandro Sosnik (Technion – Israel Institute of Technology) and Dr. Vitor Gaspar (University of Aveiro)
Work in the secondment	Metatissue (advanced 3D models of brain tumors)

Vacancy requirements	
Qualifications	Solid background in nano and biomaterials or nanoscience or bioengineering/biomedical engineering and basic background in organic chemistry/polymer chemistry. Having a master degree or equivalent diploma, and not having a doctoral degree
Requirements	MSCA-recruiting rules are applied. Not having resided in Israel for more than 12 months in the 3 years immediately before the recruitment date, and not having carried out their main activity (work, studies, etc.) in Israel during this period.
Languages	Excellent command of written and spoken English is a must
Skills	Ability for research management, dissemination, communication with colleagues and supervisors, strong teamwork spirit, creativity, problem solving and attention to safety
Experience	Research experience in the academic or industrial sector will be considered

Job Details	
Salary	Salary and benefits will follow the rules of the MSCA-DN, as foreseen in the Marie Skłodowska-Curie Actions Work Programme. Gross salary per month in Israel: 3.644,80€ (3400€ per month*CCC Israel (107,2%)) + 600 € mobility allowance Gross salary per month in Portugal: 2.866,20€ (3400€ per month*CCC Spain (84,3%)) + 600 € mobility allowance *CCC (Country Correction Coefficient)
Other benefits	Other benefits: Gross family allowance: 660€ per month - if applicable* *The family allowance will also be made available to researchers whose parental status changes during their project.
Duration	36 months
Type of contract	Full time
Place of work	*Technion – Israel Institute of Technology:* Haifa, Israel (24 months). At the end of this period, a short secondment in Metatissue is foreseen.

	University of Aveiro: Aveiro, Portugal (12 months)