

Two ICMAB researchers awarded with ERC Proof of Concept grants to advance in cancer treatments and smart packaging

Gerard Tobias-Rossell and Mariano Campoy-Quiles have been granted with European Research Council Proof of Concept (ERC PoC) grants worth 150,000 € each.



Gerard Tobias-Rossell and Mariano Campoy-Quiles | ICMAB-CSIC

The grants will be used to explore the commercial or societal potential of the results of their research projects: lithium-based nanomaterials for neutron capture therapy in cancer treatment and a new class of time-temperature indicators for cold-chain smart packaging based on organic semiconductors.

This funding is part of the EU's research and innovation programme, Horizon Europe. In total, fifty-five successful frontier researchers have just been offered ERC PoC grants in this call.

With these two new ERC PoC, the Institute of Materials Science of Barcelona (ICMAB, CSIC) counts currently with 18 ERC grants, 7 of them Proof of Concept, awarded to 11 ERC grantees. Our success rate in the last two ERC PoC calls has been 100 %.

Gerard Tobias wants to improve the efficiency of cancer treatments with nanomaterials

Gerard Tobias, researcher at the Solid State Chemistry Group at ICMAB, has been granted with the ERC PoC for the project “Targeted nanohorns for lithium neutron capture therapy” (TARLIT). Within this project, he and his team will explore the use of lithium as a therapeutic option for neutron capture therapy (NCT), a form of radiotherapy that exploits the potential of some specific isotopes for cancer treatment.

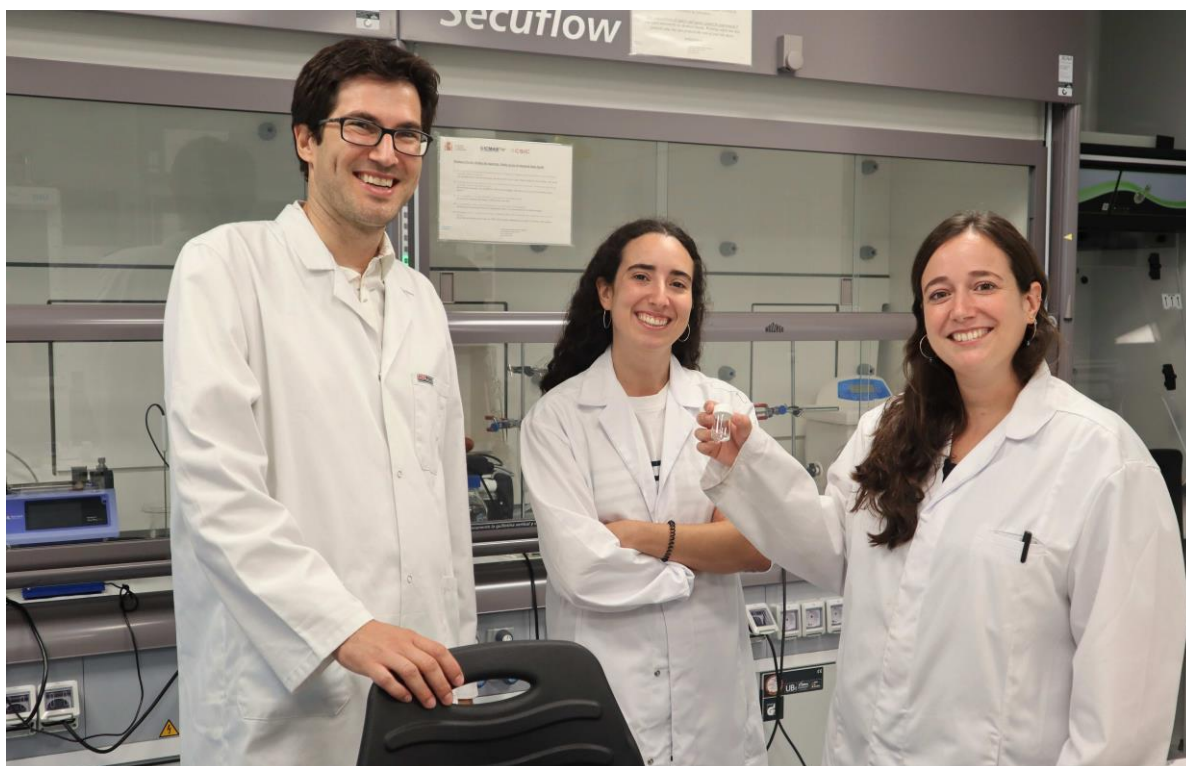
The nuclear reaction that takes place when some isotopes are irradiated with neutrons, produces lethal particles with path lengths that can limit the destructive effects to a single cell, thus conferring high therapeutic precision to this form of radiotherapy. For this therapy to be successful, enough neutron active atoms must be delivered to the tumor site so a lethal capture reaction can take place. Despite lithium is known to undergo nuclear reactions of interest for the localized irradiation tumors, research with this element has been largely limited due to its chemistry.



Gerard Tobias | ICMAB-CSIC

“With TARLIT we aim to overcome such limitation by using nanoparticles as carrier and delivery vehicle. Nuclear reactions of lithium resultant from neutron irradiation produce high energetic particles that can significantly improve the efficiency of NCT in the eradication of cancer cells and tumors” explains Tobias.

Gerard Tobias was granted the ERC Consolidator Grant “Nanoengineering of radioactive seeds for cancer therapy and diagnosis” (NEST) in 2016. This project has allowed the group to develop a variety of nanoparticles to allow an early diagnosis and treatment of cancer. These nanoparticles are highly versatile and have allowed, for instance, to deliver lithium in an unprecedented manner to cancer cells, which will be the focus of this new ERC PoC TARLIT.



Gerard Tobias, Esperanza Medina and Marina Llenas, members of the TARLIT project | ICMAB-CSIC

Mariano Campoy-Quiles wants to establish a sustainable value creation model in the market

Mariano Campoy-Quiles, researcher at the Nanostructured Materials for Optoelectronics and Energy Harvesting (NANOPTO), has been awarded the ERC PoC grant for the project “The cold-chain challenge: à la carte time-temperature indicators enabled by patterned structural colour in organic semiconductors” (VERITASCAN). Within this project, he and his team will explore a new kind of time-temperature indicators based on organic semiconductors to provide visual cues for undesirable exposure to elevated temperatures for cold-chain verification, especially for pharmaceutical, medical and food industry products, that require shipping and handling at specific temperatures.



Mariano Campoy-Quiles | ICMAB-CSIC

“Specifically, we will deliver a versatile indicator design based on vivid patterned structural colour in organic semiconductor films that is erasable on-demand by selection of molecular ‘solvents’. We aim to validate and optimize the commercial viability of the technology via comprehensive field-tests with our industrial partners” explains Campoy-Quiles.

Mariano Campoy-Quiles was granted the ERC Consolidator Grant “Finding a needle in a haystack: efficient identification of high performing organic energy materials” (FOREMAT) in 2014. Within this project, the group developed a high throughput platform to enable the ultrafast identification of promising organic materials for photovoltaics and thermoelectric generators. VERITASCAN taps into the advanced processing toolkit developed in the framework of parent project ERC CoG FOREMAT, but instead of using it for energy devices, will develop it further for advanced labelling applications.

“The key idea of FOREMAT was to structure the active layer of thin films with gradients in the parameters of interest to perform ultrafast combinatorial screening and optimization of materials for solar cells and thermoelectrics. During the process, we developed a fast and versatile method to pattern thin films, and we realized that the applicability of the patented technology is much broader. We would like to explore now a completely different application” adds Alexander Perevedentsev, researcher in Mariano Campoy’s team.



Mariano Campoy-Quiles and Alex Perevedentse, member of the VERITASCAN project | ICMAB-CSIC

About ERC Proof of Concept

The Proof of Concept (PoC) grant competition is open only to ERC grantees. They can apply for top-up funding for their existing or recently completed research projects. The 2022 Work Programme included two PoC grant calls or competitions. The winners of the first 2022 competition were already announced, as were the results of the first round of the second 2022 call. Today's announcement concerns the second of three rounds of this second call. The overall budget for PoCs in 2022 is €50 million.

In this current round, out of 120 evaluated proposals, 55 projects were selected for funding. The new grants were awarded to researchers working in 14 countries: Israel (9), Germany (9), Spain (7), France (7), the Netherlands (6), the UK (4), Sweden (3), Portugal (2), Norway (2), and Turkey (2). In addition, Finland, Cyprus, Denmark, Belgium and have each won one respectively.

In total, around 1576 PoC projects have so far received funding since 2011. With the additional money, ERC grantees can, for example, verify the practical viability of scientific concepts, explore business opportunities, or prepare patent applications. According to a recent survey, more than half of the researchers awarded PoC grants have either created companies or transferred the results of their research to pre-existing companies.



ERC grantees can still apply for PoC funding in the third round of the call in 2022. The next deadline is 29 September 2022.

About the ERC

The ERC, set up by the European Union in 2007, is the premier European funding organisation for excellent frontier research. It funds creative researchers of any nationality and age, to run projects based across Europe. The ERC offers four main grant schemes: Starting Grants, Consolidator Grants, Advanced Grants and Synergy Grants.

The ERC is led by an independent governing body, the Scientific Council. Since 1 November 2021, Maria Leptin is the President of the ERC. The overall ERC budget from 2021 to 2027 is more than €16 billion, as part of the Horizon Europe programme, under the responsibility of the European Commissioner for Innovation, Research, Culture, Education and Youth, Mariya Gabriel.

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Link with photos: <https://photos.app.goo.gl/JX2fc3Y1mvGW8htD7>