Description of Funded Research Projects
1st Call for H.F.R.I. Research Projects to support Post-Doctoral Researchers

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Research Project Title:

Fluorescent inks, pastes and filaments based on luminescent carbon dots for cutting edge and bio-applications

Principal Investigator:
Konstantinos Dimos

Fluo-Prints

Popular Title:
Materials for printed fluorescent objects of high technological value

Scientific Field:
Engineering and Technology Sciences

Host Institution:
University of Ioannina

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Research Project Summary

FluoPrints aims to the development of fluorescent inks, pastes and filaments based on carbon dots for cutting edge and bio- applications via 2D and 3D printing technologies. Carbon dots are on the research spotlight of recently, due to their biocompatibility and photoluminescence in advance, while 3D printing is considered a major technological breakthrough that will dominate multiple markets in near future.

FluoPrints targets to the synthesis of high-quality carbon dots with advanced and tuned optoelectronic properties, by sophisticated modification and the subsequent production of novel media with excellent specifications for printed applications. The final innovative products may lead the market of fluorescent printing consumables as of their benign nature, low cost, ease of preparing, complex properties and versatility, since they can be exploited in a plethora of high-tech applications such as: the formulation of custom-made biocompatible fluorescent scaffolds for bio-imaging purposes via 3D printing; for new generation printed electronics as folded sensors and “smart” identifiers; in anti-counterfeiting and information encryption, while their benign nature allows their employment by domestic users.

The project combines materials science and engineering with chemistry, cutting edge technology and medicine. Its methodology relays on advancing of known carbon dots’ synthetic procedures, i.e. microwave-assisted one-step pyrolysis, controlling all possible factors affecting their physicochemical properties, having 2D or 3D printing alternatives, thus gaining expanded applicability.

Originality and expertise grant the dissemination and exploitation of results via publications at high impact factor journals, patents, and finally high technological value but low-cost commercialized products. FluoPrints consortium composes of a greatly experienced Principal Investigator (Dr. K. Dimos), previously working as a Marie-Curie Individual Fellow on conductive inks at Cambridge Graphene Centre (CGC), accompanied by a highly promising team of new researchers as well by a supporting team of top scientists and Professors on carbon dots, carbon materials, biomaterials and optoelectronic properties.

#BrainGain #strongergreece

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Project Impact on Society

FluoPrints is expected to have multifarious impact. Nevertheless, especially for society, FluoPrints is a project that connects research to the industrial sector by producing high technological value products, including innovative bio-imaging scaffolds via 3D printing. Thus, the gained knowledge by FluoPrints may trigger local society in investing and leading the fast-growing market of 3D printing, whereas the final products, especially the bio-imaging ones, may alter the way of clinical test imaging, or enhance accuracy.

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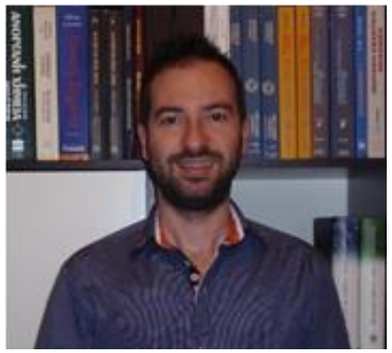
To me, H.F.R.I. funding would mean...



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The call, by the newly established Hellenic Foundation for Research and Innovation (HFRI), of research projects where a postdoctoral scientist can be Principal Investigator, is the most important action for the recognition and reward of Greek researchers; especially of a generation of scientists who had the misfortune to engage in research during the economic crisis in Greece.
After years of underfunding research, this program not only offers research jobs, but it does it with the best prospects in terms of earnings, duration and, above all, action as an individual prize. The effort to harmonize the program with the corresponding European (ERC) that gives researchers the opportunity to set up their own team, is clearly in the right direction. Personally, I used HFRI funding as reintegration grant for returning to Greece from Cambridge University, which I would not do for my involvement in a lesser research project.

The Principal Investigator,

Konstantinos Dimos

Funding

Amount: **130,500 €**

Duration: **24 months**

Foundation: **H.F.R.I.**

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