BME FIREPHARMA RESEARCH GROUP

WOULD LIKE TO JOIN A CONSORTIUM FOR
HORIZON-CL6-2022-CIRCBIO-02-03: Sustainable biodegradable novel bio-based plastics

We can contribute to the following tasks as described in the Topic:

- Develop novel sustainable bio-based biodegradable plastics with enhanced functionalities, circularity and environmental sustainability
- Develop and optimise innovative aspects of the production process,
- Test specific properties in the suitable environment

Our approach:

Our team has developed and recently patented a **novel manufacturing process** that allows the production of highly flexible poly(lactic acid) (PLA) foams. Innovative applications based on new piezoelectric and elastic properties of the bio-based and biodegradable PLA products provide the opportunity to effectively shift the electronics and other industries towards more and more circular, environmentally friendly components. In addition, the elaboration and application of complex analytical protocols (including in-line applicable spectroscopic methods and machine vision), facilitates the development of precisely controlled processing technologies capable of producing consistently high quality products.

THE FirePharma RESEARCH GROUP

FirePharma research group has accumulated a considerable amount of knowledge in the field of materials science, our activity ranges from the synthesis and formulation of new plastic modifiers, through flame retardancy of conventional and bio-based polymers, to pharmaceutical technology development. We have invested great efforts into the research of sustainable, circular materials like biobased and biodegradable polymers, as well as recyled plastics. Firepharma website.

COMPETENCES AND REFERENCES RELEVANT TO THE TOPIC

- More than 150 publications in the field of polymer science and engineering
- Patents relating to polyester recycling, foams and flame retardancy
- ISO certified laboratory for polymer processing and analysis, incl. compounding, film and foam extrusion, electrospinning, 3D printing, injection molding
- In-line applicable analytical tools (Raman, NIR spectroscopy, machine vision)
- Thermoanalytics, rheology, static and dynamic mechanical testing, flame retardancy, stability, ageing, SEM, AFM, TEM, prototyping, simulation
- Joint projects with the main actors of the Hungarian plastic industry (incl. packaging, electronic and automotive suppliers)
- Experience in EU framework projects (e.g. W2Plastics - ELV upcycling of polymer wastes, analysis, separation; Clean sky I - Nanocomposites for airplanes and Clean sky II - Bio-based composites for airplanes)
- Qualified project management staff at university level.

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS

With its regular high-ranking positions (between 200 and 800) BME is among the top universities (2-6%) globally. At the university's 8 faculties and 76 departments, there are 1,200 lecturers teaching 5,000 subjects and 10,000 courses each semester. In the H2020 Framework Programme BME has ranked #2 among the Hungarian institutions (67 funded projects). The University is an active member of the European Engineering Learning Innovation and Science Alliance (EELISA) European University, the CESAER association of universities of science and technology and the European University Association. University website

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RESEARCH TEAM
FOR HORIZON-CL4-2022-TWIN-TRANSITION-01: CIRCULAR FLOWS FOR SOLID WASTE IN URBAN ENVIRONMENT

GYÖRGY MAROSI, Professor, Head of research group

Head of the FirePharma research group at BME since 2004. Fields of excellence: polymer modification and composites, fire retardancy of polymers, Raman spectroscopy, rheological characterization. Member of Society of Polymer Engineering and MoDeSt Society, Editorial Board of Polymers for Advanced Technologies and eXPRESS Polymer Letters journals. He participated in several successful international projects (eg. EU7 framework projekts: W2Plastics - ELV upcycling of polymer wastes, analysis, separation; Clean sky I - Nanocomposites for airplanes and Clean sky II - Bio-based composited for airplanes).

Google Scholar
Hungarian Repository of Publications

Dr. DÁNIEL VADAS, Assistant Research Fellow

Obtained his PhD in 2021. He has seven years' experience in sustainable polymers and a diversified range of their processing methods such as preparation of self-reinforced composites, injection moulding, extrusion foaming, fibre production (electrospinning, melt blowing) and the monitoring of continuous processing technologies.

Google Scholar
Hungarian Repository of Publications

Dr. KATALIN BORDÁCSNÉ BOCZ, Research Associate

Obtained her PhD in 2015. She has ten years' experience in environmentally friendly flame retardancy of thermoplastic polymers and their green composites, in particular in the valorisation of polymers through the development of recycled or recyclable self-reinforced composites, preparation of new multifunctional additives and quality-controlled polymer processing methods.

Google Scholar
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Dr. ANDREA TOLDY, Associate Professor

Obtained her PhD in 2007, DSc in 2019. She led several national and european projects in the field of environmentally friendly flame retardant polymer systems, composites from renewable sources, value-added recycling of polymers. In 2009 she was awarded the L'ORÉAL-UNESCO For Women in Science Prize.

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