Benign-by-design nanomaterials for a more sustainable future: present and outlook

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The design of benign and environmentally sound methodologies has been the driving force of scientists in recent years towards more sustainable methodologies.
Attractive and innovative protocols that nowadays are even part of industrial ventures including biomass-derived porous carbonaceous materials, designer nanomaterials for catalytic applications and catalytic strategies for biomass/waste conversion into useful materials, chemicals and fuels have been recently developed in our group in recent years. These topics have extensively covered the preparation and design of (nano)materials, biocatalysts and photocatalysts and their utilisation in heterogeneously (bio)(photo)(electro)catalysed processes, flow chemistry as well as in biomass/waste valorisation practices.
An important research avenue from the group deals with the search for novel and alternative reaction media in Organic Synthesis including mechanochemistry, organocatalysis and photo-redox processes as well as greener catalytic processes in Organic Chemistry (flow chemistry) for the synthesis of APIs.
In this lecture, we aim to provide an overview of efforts from our group in leading the future of global scientists in benign-by-design methodologies including the “waste-to-pharma” concept.

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BIO

Rafael Luque (PhD in 2005 from Universidad de Cordoba, Spain) has significant experience in biomass and waste valorization practices to materials, fuels and chemicals including nanoscale chemistry, green chemistry and catalysis as well as environmental remediation with a particular interest on plastic waste and bioremediation (900+ publications, h-index 107, >53,000 citations, 7 patents, 10 edited books). He has been named 2018, 2019, 2020, 2021 and 2022 Highly Cited Researcher (Clarivate Analytics). Prof. Luque is currently DFSP Chair Professor at King Saud University (Saudi Arabia), holding various positions as Head of B4 group (Bioresources, Biopolymers, Biotechnology and Biorefineries) and Project Director at National University of Science and Technology Polytehnica Bucharest (Romania), Director of the Center for Molecular Design and Synthesis of Innovative Compounds for Medicine at RUDN University in Moscow (Russia), International Distinguished Scientist and Rectoral Advisor at Universidad ECOTEC (Ecuador) as well as Rosario Pietropaolo Honorary Chair at Universitá degli studi Mediterranea di Reggio Calabria (Italy).