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Euroscicon Conference on 3D Printing
August 05-06, 2019 | Paris, France

3D PRINTING IN PHARMACEUTICAL AND MEDICAL DEVICE MANUFACTURING

The 3D printing (3DP) process was patented in 1986; however, only in the last decade has it been used for medical applications, as well as being utilized in the fields of prosthetics, bio-fabrication, and pharmaceutical printing. 3DP or Additive Manufacturing (AM) is a family of technologies that implement layer-by-layer processes to fabricate physical prototypes, based on a Computer Aided Design (CAD) model of the design. 3D printing permits the fabrication of high degrees of complexity with great reproducibility, in a fast and cost-effective fashion. 3DP technology offers a new paradigm for the direct manufacture of individual dosage forms, and has the potential to allow variations in their size and geometry varied to control dose and release behaviour. 3DP thus offers the perfect innovative manufacturing route to address critical capability gaps hindering the widespread exploitation of personalised drug delivery systems and medical devices. Ideally, the design and fabrication of such systems should be customised to each individual patient. This talk will focus in the manufacturing of drug delivery systems & medical devices (e.g. catheters, meshes, microneedles, tablets) using innovative 3D printing technologies. Including in-house prepared filaments by hot-melt extrusion (HME) and granules/pellets by Twin Screw Granulation (TSG).

Biography

Dimitrios Lamprou (Ph.D., MBA) is Reader in Pharmaceutical Engineering and MSc Programme Director at the School of Pharmacy in Queen's University Belfast (UK) and Visiting Researcher at University of Strathclyde (Glasgow, UK). Dimitrios has experience of teaching in Higher Education, conducting research (70+ publications, 200+ conference abstracts, 80+ Oral/Invited Presentations) and securing national and international funding (£2M+). He is Secretary at the United Kingdom and Ireland Controlled Release Society (UKICRS), Ph.D. examiner for UK and International Institutions, and referees for journals, publishers and research funding bodies. His group is applying Nano and Microfabrication Techniques in Pharmaceutical and Medical Device Manufacturing. More specifically, his areas of interest includes: Additive Manufacturing (3D Printing & Bioprinting), Electrospinning (Melt & Solution), and Microfluidics (Particle Formulations & Chip Manufacturing).

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