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## Lectrofluidinamics: A new toolbox to design instructive platforms for tissue engineering and molecular therapies

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A large variety of processes and tools is recently emerging to design instructive materials with controlled chemical, physical and biological properties for tissue engineering and drug delivery. Among them, electro fluido dynamic techniques (EFDTs) are revolutionising traditional biomaterial's manufacturing approach, basically identifying relatively complex fabrication processes to design innovative devices with restrained manufacturing costs but high functional complexity. By the use of electrostatic forces, biomaterials may be manipulated in different forms for the fabrication of a large set of 3D platforms with controlled micro/nanostructure (*i.e.*, scaffolds, nanoparticles, capsules, mono or multicompartament systems, microgels and microscaffolds) able to more efficiently address *in vitro* and *in vivo* cell activities. EFDTs allow to produce fibres and/or particles at micro- and/or submicro-metric size scale through a rational selection of polymer solution properties and process conditions, thus creating different 3D devices able to incorporate biopolymers (*i.e.*, proteins, polysaccharides) or active molecules (*e.g.*, growth factors, chemotherapeutics) for countless applications in tissue engineering, drug delivery and cancer therapy. Here, we overview the basic EFDTs technologies – *i.e.*, electrospinning, electrospraying and electrodynamic atomization – and recent current advances in experimental setups to develop bio-inspired platforms for tissue engineering, drug delivery and cancer therapy.

### Biography

Vincenzo Guarino, PhD in Biomaterials Science, is a Senior Research Scientist at IPCB-CNR since 2006. He is expert of process technologies for scaffold design and electrofluidodynamic technologies (*i.e.*, Electrospinning, Electrospraying, Electro Dynamic Atomization) to produce micro/nanofibres, particles and capsules for tissue regeneration, drug delivery and cancer therapy. He is author of over 70 international publications (H-Index 20 – Scopus source), 9 book chapters, 2 patents (1 pending) and about 200 communications in international/national conferences and awarded as author/co-author in several international congresses on biomaterials. He is also Editor/Reviewer of several international journals, and Member of the European (ESB) and Italian (SIB) Society of Biomaterials and American Nano Society.

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