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Electrohydrodynamic atomization technologies in pharmaceutical development; recent advances and future directions

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Experimental pharmaceutical dosage form development and preparation technologies have diversified over the last few decades. In addition, the Pharma industry now has a warm willingness to consider unconventional methods and processes for advanced and miniaturized drug dosage form development. There are several drivers for this ranging from the need to improve existing properties of current systems or to develop more complex miniaturized dosage forms by using challenging APIs; which are not possible with well-established pharmaceutical technologies; once such concept which is currently evolving as a hot prospect in the manufacturing of novel pharmaceutical dosage forms is Electrohydrodynamic Atomization (EHDA). This concept has been used to prepare particles, bubbles, fibers, hollow nano-capsules as well as printed 2D and 3D structures. There are several other crucial aspects of this technology which make it appealing to the pharmaceutical industries (e.g. stability, formulation and facile encapsulating ability). This talk will be broken down into three main components. Firstly, explaining how base EHDA concepts are tailored (from ideas) into various emerging drug dosage forms. Secondly, examples of how recent EHDA developments are being used to propose routes to address timely global healthcare challenges (through novel pharmaceutical dosage form concept development and delivery). Finally, some examples of how initiatives between industry and academia are being advanced to maximize or mature EHDA technologies that bring them to fruition and closer to reality (e.g., the EPSRC-EHDA network in the UK). The talk will cover key innovation aspects which will be beneficial to industrial and academic attendees.

Biography

Zeeshan Ahmad has obtained his BSc and PhD (2007) from the University of London. He has worked as a Research Fellow on several drug delivery and biomaterials projects at Queen Mary and University College London before taking up a lectureship in Pharmaceutics in the University of Portsmouth, School of Pharmacy in 2010. He then moved to the Leicester School of Pharmacy in 2013, and recently was appointed as the Chair in Pharmaceutics (2016). He also leads a UK wide initiative (academic and industrial) on EHDA Technologies and is also a Royal Society Industry Fellow. He has published extensively and specializes in drug delivery, nanotechnology, pharmaceutical technologies and biomaterials. His research group comprises national and international PhD, MSc and undergraduate students where the focus is on developing advanced nano, micro and macro drug delivery systems through interdisciplinary design, concepts and technology.

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