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## Metrology in pharmaceutical manufacturing

Dimitrios A Lamprou  
University of Kent, UK

Structure-property relationships are often poorly defined in advanced continuous pharmaceutical manufacturing processes and products and hence it is difficult to control final product performance to the required degree to deliver advanced functionality. The dynamics of particles within complex mixtures and the effect of processes and storage on their disposition and microstructure is also challenging to measure. Hence, there is a clear need to have techniques for analysis and measurement of composition, dynamics and structure with increased spatial and temporal resolutions. Secondary Ion Mass Spectrometry (SIMS) is a technique that enables the analysis of the ionized particles (secondary ions) emitted when a surface is bombarded by energetic species (primary ions). To apply this technology to the study of pharmaceutical products is extremely interesting in order to investigate the precise distribution of Active Pharmaceutical Ingredients (APIs), impurities or excipients in the formulated product, also in a three dimensional visualization, to have a better understanding of the impact that this could have on its final performance. The aim of this work was to visualize the lateral and depth distribution of the drug in the polymer matrix, using ToF-SIMS, and to relate this data to the drug elution rate. The findings were supported with data from other techniques, such as Atomic Force Microscopy (AFM), Raman confocal imaging and micro CT.

## Biography

Dimitrios A Lamprou is an Associate Professor in Pharmaceutics at University of Kent, and has been trained in multidisciplinary areas and worked in first class laboratories. He has experience of Teaching in higher education, conducting research and securing national and international funding (over £1M). He has authored over 40 articles in high impact multidisciplinary journals, and over 130 poster and podium presentations at national and international conferences.

dimitrios.lamprou@strath.ac.uk

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