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Editorial

Imaging tools for pharmaceutical development

Drug release is the result of a complex interplay between the drug, its carrier, and the release environment. Fascinating strategies are under development or are currently investigated to optimise the drug product to provide a time and spatial controlled release. However, many of these novel strategies have not met the expectations. In many cases, the reasons for failure are not easily recognisable and standard *in vitro* tests do not discriminate between formulations that perform well and those that fail *in vivo*. Imaging techniques provide unique information about complex drug delivery processes both *in vitro* and *in vivo*. They are useful tools for drug development in the early stage of *in vitro* testing as well as in the preclinical and clinical in phase.

Without any doubt, imaging techniques are fascinating new investigational tools because we like to see and measure and not just believe. However, their usefulness can be limited by the lack of sensitivity, specificity, long measurement times or high installation and running costs. It is the aim of this special issue to show not only the potential, but also the limitations of several imaging techniques.

Covered techniques include Atom Force Microscopy [1], Terahertz Imaging [2], Confocal Raman Microscopy and Photothermal Imaging [3]. Preclinical and clinical in vivo methods include PET [4], Micro-CT [5], Electron Paramagnetic Resonance Spectroscopy [6] and Imaging, Magnetic Marker Monitoring Biosusceptometry [7] and Magnetic Resonance Imaging [8]. The issue illustrates the fast development and improvement of existing techniques [9–13]: for example, the new development of Benchtop-MRI allows the broader use of MRI mainly due to the decreased installation and running costs.

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