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Personalized pills by 3D printing: Challenges and potential

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Oral medicines manufactured using conventional tableting and capsule filling methods can fulfil basic therapeutic functions and they are the most preferred route of administration due to their non-invasive and convenient nature. However the adherence of the patients with chronic conditions such as cardiovascular disease, cancer and neuro-degenerative diseases have low adherence to prescribed medicines and with complex medicine regimens, adherence can be as low as 50% . This is a global problem and the lack of adherence to prescribed medicines is estimated to cost the NHS over £500 million each year. Clinical evidence has shown that using polypills (incorporating multiple medications into one pill) can significantly improve patient adherence to the treatment. 3D printing (3DP) can provide the high flexibility required for providing built-in sophisticated microstructures to host different drugs with easily adjustable doses in different parts of a single polypill and has well-recognised potential for personalised polypill manufactuering. However there is a wide range of challenges that 3D printed personalised polypills face which are barriers for translation of the technology into clinical products. This presentation will discuss these challenges in detail and present the latest developments in technological strategies on how to overcome these issues in order to fast-track realization of the clinical potential of 3D printed personalised polypills.

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