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### **Additive manufacturing in the service of personalized medicines – opportunities and future plans**

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After the expiration of the first patents of various 3D printing technologies, different manufacturers have appeared on the market with desktop 3D printers. Over the last decade additive manufacturing has become a commonly available technology and made its way to most of the industries including the pharmaceutical industry.

Fused Deposition Modeling (FDM), Inkjet – powder bed and Stereolithography (SLA)<sup>1</sup> are the most investigated technologies which offer a promising tool for pharmaceutical technological application. The industrial significance of 3D printing was supported by the FDA approval of the first 3D printed medicine Spritam® (Aprecia Pharmaceuticals)<sup>1</sup> combining the precision of 3D printing and formulation science to produce rapidly disintegrating levetiracetam-containing tablet for oral suspension. Besides the industrial utilization 3D printing can transform healthcare through personalized medicine, thus improving patient compliance by tailoring the medication to the patient. This can be achieved through on-demand manufacturing in clinical settings to offer the best medical care. FabRx Ltd. (UK)<sup>2</sup> applies FDM technology to produce personalized tablets (printlets) based on the physiological parameters of each individual patient. Their development in field of rare diseases, metabolic disorders and nutraceuticals already reached clinical trial phase. Besides pharmaceutical formulations, Additive Manufacturing (AM) also has a huge impact in the medical device industry. The best fit for the given patient in orthopedic implants can be achieved by Digital Imaging and Communications in Medicine (DICOM) processing connected with metal 3D printing.

Based on the mentioned opportunities our aim is to develop a fully customizable FDM based implantable drug delivery system mostly with intranasal application routes.

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