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### The broadening horizons of pharmaceutical 3D printing – Simple strategies for complex formulations

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The undeniable potential of 3D printing in the pharmaceutical field has been highlighted due to the notable extent of research triggered by the possibility to deliver personalized drug products. We aimed to support the translation of fused deposition modeling into a flexible pharmaceutical dosage form manufacturing platform by providing simple strategies that enable the customization of the obtained products. Thus, we developed a tablet that allowed the immediate release of the drug due to two major factors. The first one is the unique design (honeycomb structure) that granted a high surface area to volume ratio, while the second one is the low polymer content of the filaments employed for the printing process. These findings were further applied to obtain a product of increased complexity, namely a tablet that assured the sustained release of the API. A bilayer tablet geometry was designed, consisting of a fragment with a honeycomb structure and another fragment with 100% infill. The former was destined to assure the immediate release of an API dose and it was fabricated using the previously mentioned drug-loaded filaments with low polymeric content, while the latter was considered to enable the slow dissolution of another API dose and was manufactured using a drug loaded filament with an increased polymeric fraction. Our investigations provided novel approaches that could further be used to bring the fused deposition modeling technique closer to real-life applicability in the pharmaceutical domain.

#### References:

1. Crișan AG. Int. J. Pharm. 613, 121411 (2022)