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MICROCONTAINERS FOR INTESTINAL DRUG DELIVERY: *in vivo* and *ex vivo* study

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The oral administration route is the one most preferred by patients. The digestive system presents several challenges: the low gastric pH, the intestinal mucus and the presence of enzymes can all reduce the therapeutic effect of the active pharmaceutical ingredient (API). Capsules and tablets are commonly used dosage forms in clinical practice. Nevertheless, in these drug delivery systems (DDS), the API is released in an omnidirectional manner entailing an unavoidable loss of the therapeutic substance in the intestinal lumen. Microcontainers (Fig. 1 a) are micro-fabricated cylindrical reservoirs filled with the API which can be used as a multi-particulate system with an intrinsic unidirectional release due to their geometry[1]. Hereby, we present the *in vivo* and *ex vivo* performances of microcontainers as DDS for ketoprofen chosen as poorly soluble model drug. Microcontainers were filled with polyvinyl pyrrolidone (PVP, 10^4 Da) and loaded with ketoprofen by supercritical CO_2 assisted-impregnation[2]. The cavities of the microcontainers were sealed with an enteric coating (Eudragit L100/dibutyl sebacate) deposited *via* spray coating to activate the drug release upon reaching the intestinal pH[3]. The DDS was characterized both *in vitro*, *in vivo* (Fig.1 b) and *ex vivo* (Fig. 1 c). The results suggest the suitability of the microcontainers as carriers for other APIs, such as insulin or the already *in vitro* tested Cyclosporin A.

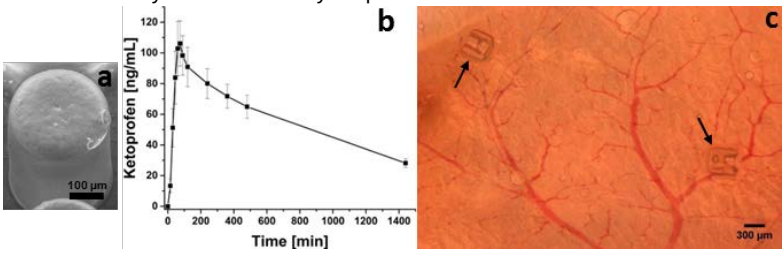

Figure 1 – a) SEM image of a loaded and coated microcontainer; b) Plasma concentration-time profile of ketoprofen in orally dosed with the aforementioned DDS rats; c) Optical micrograph of microcontainers within rat´s jejunum after oral administration (*ex vivo* study).

References

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