Towards a 3D bio-printed *in-vitro* model for liver

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COVID-19 pandemic has highlighted for pharmaceutical companies the need for available and reliable in-vitro models that can shorten the validation process necessary for the marketing of drugs. Particularly in the context of drug development, the liver plays a crucial role as it is primarily involved in drug metabolism and represents the most frequent reason for drug failure in clinical trials and post-marketing drug withdrawal. Moreover, still efficient treatments lack for liver chronic-degenerative diseases, such as fibrosis, cirrhosis, and carcinoma; each of these is characterized by an increasingly overproduction and deposition of extracellular matrix (ECM) going to interfere with the drug's efficacy and consequently causing chemotherapy resistance. Nowadays, 3D bioprinting is a well-known technique that can be exploited as a tool for producing 3D customized *in-vitro* models in an automotive and high-throughput way. Biomaterials very used in this field are hydrogels thanks to their highly hydrated content and capacity to mimic the ECM environment. In this work, we show the first steps towards the design and development of a hydrogel composed of an alginate-gelatin blend in which liver decellularized ECM (dECM) powder is added. In addition to biological features, we aim to create a bioink with tailorable mechanical properties by playing with alginate concentration and crosslinking aspects. This will permit to replicate a precise stiffness value, characteristic of a patient-specific pathological condition, and to better understand the effectiveness of drug treatment on him.