Dr. Bastien Venzac

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Biography

Bastien Venzac received an engineering degree in physics and chemistry in 2012 from the ESPCI (École Supérieure de Physique et Chimie Industrielles, France), a top 10% French engineering school, followed by a master degree in microfluidics from the Pierre-Gilles de Gennes Institute (France). In 2016, he received a PhD degree from the Pierre and Marie Curie University (France) for his work on microfluidics-based DNA detection for bacterial analysis in the team of Jean-Louis Viovy at the Curie Institute (France). Since 2017, he has been a post-doctoral researcher in the AMBER (Applied Microfluidics for Bio-Engineering Research) group at the Twente University (the Netherlands) under the supervision of Prof. Le Gac. Currently, he acts as project leader and principal investigator for a project (lung-on-chip model for nanoplastics toxicity) funded by a ZonMW Microplastics & Health grant. He focuses on the development of microfluidic devices for biological applications, especially on organ-on-chips (kidney, oviduct, embryo, skin, cartilage, testis and lung-on-chip). He is very active developing innovative microfabrication approaches (e.g., using 3D printing, low-cost and equipment-free engineering) and toolboxes to improve the user-friendliness of microfluidic devices and fabrication, in order to accelerate the transfer and adoption of organ-on-chip systems in biological and medical laboratories.

Abstract - Organ-on-a-chip platforms for cartilage and assisted reproductive technologies

Modern biology has been built on two main pillars: on one hand, in-vivo studies using animals or human subjects, and, on the other hand, in-vitro culture of cells and tissues. Animal experimentation is subjected to strict regulation and animal models are most of the time not representative of the human physiology; in-vitro systems are often too simplistic to predict in-vivo mechanisms. The emergence of advanced cell and tissue culture systems called organs-on-chip, that rely on microfluidics technology, is revolutionizing how biological studies are performed, from drug screening to fundamental research, by mimicking organ structures, functions and environments. At AMBER (Applied Microfluidics for Bio-Engineering Research), we are developing and using innovative platforms to reproduce organs and tissues as diverse as cartilage, lung, oviduct, testis or tumors, for nanoplastic toxicity screening, reproductive medicine and tumor research.

In my presentation I will particularly discuss two areas of applications of the so-called organ-on-a-chip platforms: assisted reproductive technologies (ART) and cartilage research.