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Functional medical micro-tattoos for monitoring and diagnostic applications

Prof. Dr. Davide Brambilla

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University of Montreal, Canada

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Joint event with the Seminars on Drug Sciences, Pharmazentrum UniBasel

Lecture hall U113, DCBP

Apéro in front of U113 at the end of the seminar

Abstract:

Early diagnosis and patient monitoring are a key elements of modern medicine and as important as effective therapeutic strategies. Intensive research is constantly devoted to the development of technics for diagnostic or monitoring of parameters associated with diseases. While remote monitoring is an attractive concept, its utility has historically been limited by the invasive nature of implantable devices or blood sampling. To this end, other monitoring matrices have also been proposed, notably dermal interstitial fluid (ISF): the extracellular fluid surrounding cells in the dermal and epidermal layers, showed important results. Recent studies, including ours, have suggested that there is an overlap of roughly 93% between the proteomes in plasma and in the ISF. Additionally, similar concentrations of molecules and ions have been observed, with alterations in plasma levels rapidly reflected in the ISF. We recently showed that MNs bear ideal properties for generating naked-eye invisible micro tattoo that, combined with a portable or wearable fluorescence reader, can be used to monitor physiological and pathological signals.

About the speaker: Prof. Dr. Davide Brambilla

Davide Brambilla is associate professor of drug delivery at the Faculty of Pharmacy at the Université de Montreal, Quebec, Canada since 2022. Prof. Brambilla completed his PhD in pharmaceutical technologies at the School of Pharmacy of the University of Paris-Sud with Patrick Couvreur on the design of nanoparticles for drug delivery applications. In 2012, he joined the laboratory of JC Leroux at ETH Zurich where he was postdoctoral scientists and then group leader. In 2017, he was appointed Assistant Professor at the Université de Montréal, where he started his research laboratory focused on micro and nanotechnology-based drug delivery tools and diagnostic devices, and teaches the development of biological drugs and pharmacokinetics. He is a junior research fellow of Québec Research Fund, the biotherapy research Chair from the Canadian Generic Pharmaceutical Association and Biosimilars Canada, the current secretary of the Canada Biomaterial Society and the past-president of the Canadian chapter of the Controlled Release Society, and acts as assistant editor of the Journal of Controlled Release. He co-authored over 50 publications in peer-reviewed journals and filed 3 patents.