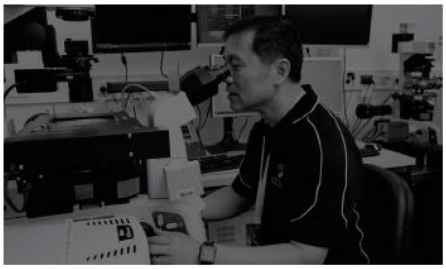

Micro- and nanotopographies for biological applications

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11:00am, 07/02/2023
At the Melbourne Centre for Nanofabrication Boardroom
151 Wellington Road, Clayton, 3168
Zoom link: https://monash.zoom.us/j/82615345345?pwd=Q1pBTHBKaVROTjJrTllkbTNuRjJqUT09
Meeting ID: 826 1534 5345 and passcode: 465451

Micro- and nanotopographies for biological applications

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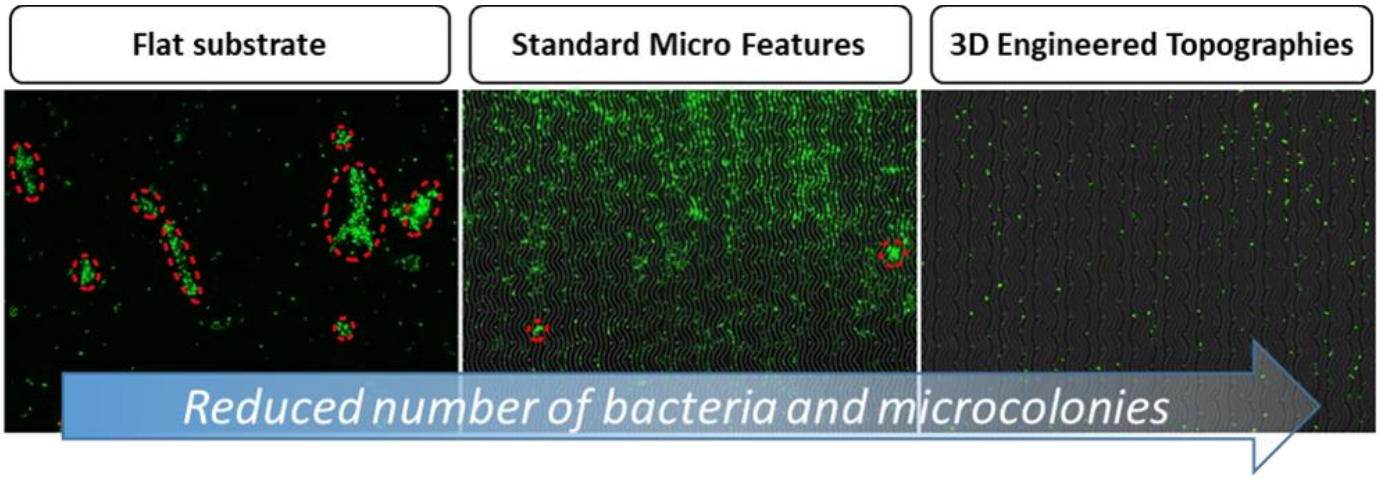
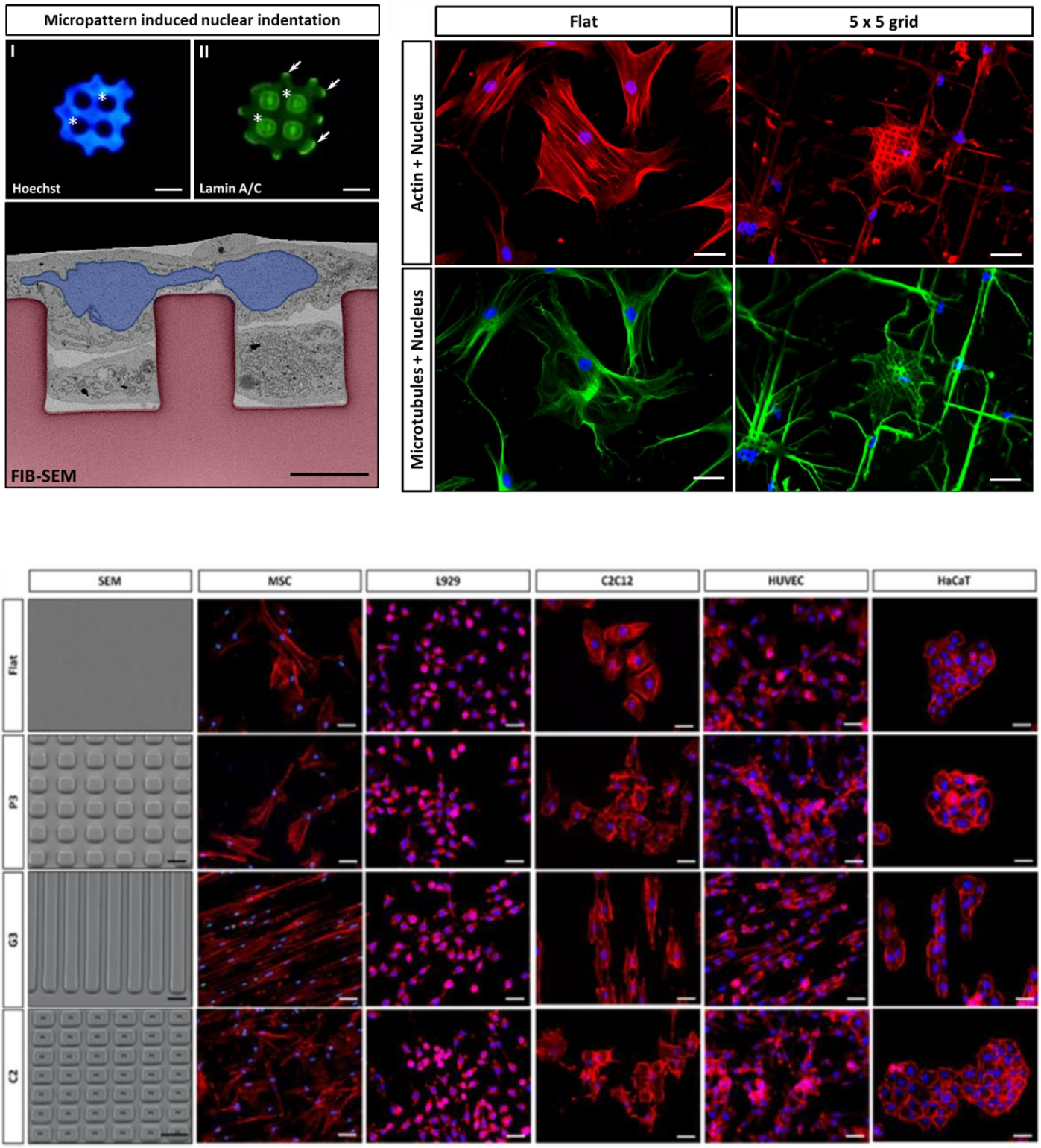
Abstract:
Substrate topography at the micro and nanoscale is emerging as a powerful tool to manipulate cell behaviour, but studies into these effects are hampered by a lack of access to topographies that can be readily incorporated with the standard biological techniques and methods of analysis.

Current techniques to produce micro and nanopatterned substrates are often difficult to produce across a surface area large enough to perform biological analyses, require time consuming and tricky manipulation of substrates into standard cell culture plates and are typically not made of the same material (polystyrene), which further complicates any comparison with typical cell culture datasets. Furthermore, there are indications that complex topographies with 3D features play a key role in the cell to substrate interactions, but obtaining such features over large areas is still extremely challenging.

We have developed simple and scalable technologies to overcome these drawbacks. Here I will show how these technologies can be used to implement topographies on standard Tissue Culture Plastics, regularly used by biologists and how complex 3D topographies can be formed by means of a single standard UV-lithography exposure. We prove the effect of these by testing these two technologies on mammal and bacterial cells, for cell regulation and fate determination and for antimicrobial purposes. These technologies could open up the potential of micro/nano-topographies in the culture and screening across an enormous range of biological applications.





"After completion of a PhD in the area of micro and nanotechnology for microsystems and sensors at the National Centre for Microelectronics in Barcelona Spain, Dr Victor J Cadarso undertook two postdoc positions at the EPFL and an Ambizione Fellowship (similar to an ARC DECRA) in the Paul Scherrer Institute, in Switzerland, before taking up a Senior Lecturer position at Monash University in 2016. Dr Cadarso's work has resulted in high quality publications in a multidisciplinary domain and in the creation of new products being now commercially available (from Micro Resist Technology GmbH), the creation of intellectual property (IP) including two licensed patents (to SamanTree Medical SA and to Composyt Light Labs SA), and he co-founding of two start-up companies, including Proton Intelligence in 2020."