

Wednesday, 9th February, 15.15pm, Online

Host: Prof. Aitziber L. Cortajarena

***In Vivo* Cell Reprogramming: from Proof-of-Principle towards Applications in Tissue Regeneration**

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Overexpression of *Oct3/4*, *Klf4*, *Sox2* and *c-Myc* (OKSM) transcription factors in adult living tissues has shown to induce cellular reprogramming *in situ* – to pluripotency or to intermediate, partially reprogrammed states – that can contribute to tissue regeneration or rejuvenation. Evidence that a great plethora of tissues and cell types respond to this reprogramming cocktail suggests a myriad of therapeutic opportunities in ailments as diverse as muscular injuries, heart and neurodegenerative diseases, or ageing. However, various challenges remain to be addressed before *in vivo* cell reprogramming can evolve from an interesting experimental observation into a translatable regenerative intervention, particularly concerning the safety of the approach. In this seminar, I will discuss my work using different viral and non-viral vectors as well as transgenic, reprogrammable mouse models to express OKSM and induce reprogramming *in vivo*, starting from the proof-of-concept and demonstration of reprogramming in mouse liver and leading to our latest results that confirm reprogramming and proliferation of otherwise postmitotic cardiomyocytes in the adult mouse heart. I will also discuss pros and cons of different reprogramming methods, barriers, and opportunities in the road towards translation.