Abstract Template

Title: Biofabrication of a tumour microenviroment on-a-chip.

Daniel Nieto[1,*], Alberto Jorge de Mora[2], Jesus Pino[2], , Gerard O'connor[3], Linh Nguyen[4], Hua Ye[4] and Amir Miri[5].

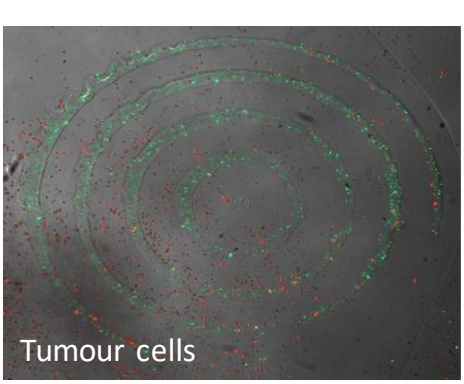
[1]Photonics4life group, University of Santiago de Compostela, Santiago de Compostela, Spain
[2]SERGAS (Galician Health Service), Orthopaedic Department. Universidad de Santiago de Compostela.
[3]National Centre for Laser Applications of Ireland, NUI Galway, Ireland.
[4]Institute of Biomedical Engineering, Oxford University.
[5]Department of Mechanical Engineering, Rowan University, Glassboro, NJ 08028 USA.

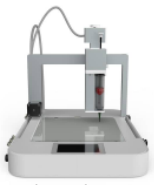
Keywords: Biofabrication, tissue engineering, tumour-on-a-a-chip.

I. Abstract Body (up to 250 words)

The cancer microenvironment is highly complex, and is highly dynamic with distinctive key features (*e.g.* cellular and ECM compositions, matrix stiffness, and degree of vascularization) present at each of the different stages of the disease (3, 4). In particular, the large-scale growth of a tumour ultimately requires a blood supply (5-7). To fully grasp the complexity of the tumour microenvironment, as well as screening of various anti-cancer drugs, it has been increasingly realized that *in vitro* engineered human cancer models are strongly desired. In particular, three-dimensional (3D) cancer models are anticipated to precisely mimic the *in vivo* tumour microenvironment in human patients by recapitulating the proper tumour cell/matrix composition and other key parameters that match both the type and stage of the disease, and therefore provide accurate mechanistic studies as well as a tool for personalized anti-cancer therapeutics studies. In this work present a tumour-on-a-chip device, which integrates a microfluidics biochip, tissue engineering and biomaterials. We demonstrate the bio printability of endothelial and tumour cells inside the microfluidics biochip. The objective is to in-vitro study of metastasis processes: 1) the interactions of tumour cells with the surrounding medium and neighbouring cells and 2) the critical processes in cancer related to cancer invasion and haematological dissemination.

II. Image:







III. Reference:

1. American-Cancer-Society. Cancer Facts and Figures 2016. American Cancer Society: 2016.
2. Organization WH. World Cancer Report2014.
3. Cao Y. Tumor angiogenesis and therapy. Biomedecine & Pharmacotherapy. 2005;59(Supplement 2):S340-S3.
4. Fukumura D, Jain RK. Tumor microenvironment abnormalities: Causes, consequences, and strategies to normalize. J Cell Biochem. 2007;101(4):937-49. doi: 10.1002/jcb.21187.
5. Weis SM, Cheresh DA. Tumor angiogenesis: molecular pathways and therapeutic targets. Nat Med. 2011;17(11):1359-70.
6. Carmeliet P, Jain RK. Molecular mechanisms and clinical applications of angiogenesis. Nature. 2011;473(7347):298-307.
7. Folkman J. Tumor Angiogenesis. In: George Klein SW, Alexander H, editors. Adv Cancer Res: Academic Press; 1974. p. 331-58.

IV. Biography:

Daniel Nieto has completed his Master degree at the National University of Ireland and his PhD at the University of Santiago de Compostela and Postdoctoral Studies from Harvard Medical School and Oxford University. He is postdoctoral researcher at the University of Santiago de Compostela, He has published more than 37 papers in reputed journals and has been serving as an editorial board member of repute journals on tissue engineering.

V. Presenting author details



Full Name: Daniel Nieto
Contact number:+34 605943411
Session name/ number:
Category: (Oral presentation/ Poster presentation)
Passport Number: AAA454740