Natural biomaterials for 3D *in vitro* cancer cell culture

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The different types of natural, synthetic and bended matrices are prepared for cell-based tissue engineered cancer/disease models. Now a day biomaterial matrix is being used for 3D cell culture for obtaining the appropriate 3D models for drug screening other than 2D mono-layer/flat culture. The success of any strategies for tissue engineering and regenerative medicine entirely depends on the choices of the scaffolds/hydrogels prepared mainly from the natural origin materials including marine origin biopolymers. We usually pay attention to those natural biomaterial matrices, which provide an appropriate environment for regenerations of different tissues (e.g. cartilage, bone, skin, and tendon and/or cancer and other diseases). We also prefer that the matrices that support as delivery systems for bioactive molecules too. To develop proper processing methods for fabrication of different scaffolds are also rely on the selection (s) of appropriate natural materials (such as silk, chitosan, collagen, gelan gum and others), which are easily available, functionalized, blended, support easy processing and cost effective. Equally, the cell sources are important for 3D *in vitro* mono- and/or co-cultures either for static or dynamic ways. We have developed several strategizes using different kinds of biomaterials for the different cell cultures for their growth, viability and differentiation in 3D environment for regeneration therapies including different cancer cell cultures. The cancer cell proliferation, migration and metastasis are dependent on the extracellular matrix; therefore, we create a 3D cell culture microenvironment using different associated cells, which interact with cancer cells namely bone, lung, gastric and breast cancers for investigating their proliferations and migrations. During this presentation, we will discuss what we are doing at 3Bs research group in general using natural origin biopolymers and will focus especially on natural silk as biomaterial for cell culture (Financially supported by European Union Framework Programme for Research and Innovation Horizon 2020 under ERA-Chair grant agreement nº 668983-FoReCaST)