

# Modified Scaffolds in Radial Flow Bioreactor for 3D Mammalian Cell Culture

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The bioreactors are used to generate volumetric cell cultures, to conserve the bulk properties of the tissues and the morphology, on biomaterials used like scaffolds for a great proliferation as the 2D cultures [1].

We used 3D scaffolds of PLLA, modified in the surface with polypyrrole (PPy) by plasma polymerization, to growth hepatic cells (Hep G2) in a radial flow biorreactor (RFB), this modified scaffolds increase the cellular proliferation and protein production, and shown that we got a RFB for mammalian cell culture. The PPy plasma polymerization has demonstrated that increase the cellular adhesion without modified the properties of the target scaffolds and it can be biocompatible, using for cell cultures and implants in rats [2].

We design the RFB, to use a lot of modified materials by plasma polymerization and different mammalian cells, using the microscopy we obtained the images of the material and the cells, and then show the system is a good bioreactor for the 3D proliferation of hepatic cells in volumetric scaffolds modified in the surface and show that the protein secreted by the cells in the RFB increased using the modified scaffolds than the target scaffolds [3]. These experiments concluded that we obtained a three-dimensional hepatic cell culture on covered scaffolds of a thin film of polypyrrole (PPy) morphological and physiological viable.

## References

- [1] Hiramoto A, Matsuura T, Aizawa M.. Arch BioCeramics Res 2006; 6: 220-223
- [2] R. Olayo, C. Rios, Journal of Material Science (2008), **19**:817–826
- [3] J. MORALES, M. G. OLAYO, J. Polymer Science Part B: Polymer Physics 38 (2000) 3247