

2<sup>nd</sup> International Conference on

# Antibodies and Therapeutics

July 11-12, 2016 Philadelphia, USA



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### Bioinks for 3D Bioprinting: A development parameters review

Additive manufacturing (or 3D printing) is supporting innovations in many areas. 3D bioprinting is the 3D printing of materials and cells into functional living assemblies or tissues. It is being applied to *in vitro* analytics and modeling as well as regenerative medicine. Challenges remain in many areas, including in the development of printing fluids and cell culture media employed in the printing process and post printing construct incubation and development. These bioinks have critical nutritional factor, physicochemical and rheological parameters as determined by the cell types, structural matrices and final applications involved. Functional goals of bioinks include maintenance of cell viability, development of cell functionality and control of CD phenotype and differentiation as well as providing structural support and accommodation of matrix requirements. Components of 4D bioprinting, where the deposited mass responds and evolves to its host environment will be addressed.

### Biography

William George Whitford is a Strategic Solutions Leader for BioProcess at GE Healthcare Life Sciences in Logan, UT with over 20 years experience in biotechnology product and process development. He has joined the company as an R&D Team Leader developing products supporting biomass expansion, protein expression and virus secretion in mammalian and invertebrate cell lines. He has published over 300 articles, book chapters and patents in a number of fields in the biotechnology arena.

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