**Macroporous cryogel-based systems for biomedical and environmental applications.**

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**Abstract:**

The macroporous structure of cryogels, with pore sizes ranging from 1 to 100 µm and a well-connected pore system, makes them very attractive for a variety of applications in biotechnology, medicine, and the environment. With large pores and significant amount of free (non-bound) water, cryogels create an optimal environment that promotes the growth and proliferation of mammalian cells, mimicking tissues-like conditions (1). For example, gelatin cryogels loaded with copper, cobalt, or zinc have proven effective in promoting wound regeneration (2, 3). In addition, studies have shown how HEMA cryogels support hepatocyte cell activity in a specialised bioreactor designed for bioartificial liver applications (4). Recent research include the synthesis of oligo(poly(ethylene glycol) fumarate) (OPF) cryogels, which have the potential to be used as biodegradable scaffolds for spinal cord repair (5).Cryogels have also emerged as promising materials for solving environmental problems, especially in water treatment, where they have demonstrated effectiveness in removing or degrading pollutants (6-8). In this lecture, I will delve into cryogel synthesis methods and explore their individual applications in various fields.

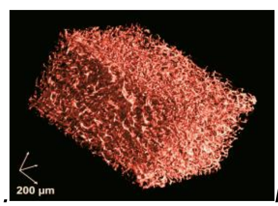
…….

*Fig 1. Cryogel, 3D reconstruction of* µCT

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