

428g Design of a Flow Perfusion Chamber for the Reconstruction of Urinary Bladder

Jose F. Alvarez-Barreto, Y. Zhang, Bradley P. Kropp, and Vassilios I. Sikavitsas

Different pathological conditions, both congenital and acquired, affect the function of the urinary bladder and can result in incontinence and damage of the kidney, among other clinical complications. Thus, the reconstruction of the urinary bladder has been of great importance in the field of tissue engineering. Different synthetic and natural matrices, such as the small intestinal submucosa (SIS), have been utilized as biomaterials for this purpose. Decellularized SIS has demonstrated great potential in the functional reconstruction of the urinary bladder. Nevertheless, the seeding of these matrices with different cell types represents a great challenge in terms of achieving an efficient homogeneity. We have designed a flow perfusion bioreactor that can yield homogeneous distributions of cells throughout the SIS surface, as well as guaranteeing optimal transport of nutrients and alignment of the cells in the direction of the flow.