

The Influence of Particle Size of Mesoporous Silica in Hierarchically Porous Scaffold on the Recruitment of Host Immune Cells

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Immunotherapy has a significant potential to treat various diseases. Dendritic cells (DCs) are most important antigen-presenting cells to deliver antigenic information to the adaptive immunity. Therefore, recruiting and educating DCs are one of the main targets in immunotherapy. Recently, we have reported a macroporous platform made of mesoporous silica rod (MSRs) that has a potential to recruit host DCs. In this study, we investigate how the size of mesoporous silica microparticles used to prepare macroporous scaffold can affect the recruitment of different types of host immune cells such as dendritic cells, neutrophils, monocytes, T cells, and B cells. Four scaffold groups were prepared with mesoporous silica of different particle sizes (1, 10, 25, 100 μm), loaded with a proinflammatory chemoattractant, and subcutaneously implanted into mice for 7 days. The recruited immune cells were extracted from the nodules in the implantation site and the types and numbers of each immune cells were analyzed by flow cytometry. This study could be helpful to determine the particle size of building blocks in macroporous scaffold for future cancer vaccine study.