**Proliferation of Spermatogonial Stem Cells on Three-Dimensional Nanocomposite Scaffolds**

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**Abstract**

The culture of spermatogonial cells for future transplantation is necessary, because these cells play key role in spermatogenesis process so are very important. Lately, scientists use the three-Dimensional scaffolds for culturing stem cells for the purpose of simulating the testicular environment and tissue. In this study, we prepared silk scaffolds that contain graphen oxide nanocomposite scaffolds utilizing the biomimetic technique and investigated the proliferation of spermatogonial stem cells on them.

SEM and FTIR on scaffolds were analyzed and all pore’s size were measured. Scaffolds survival assessment by MTT and these scaffolds didn’t have any toxicity for cells.

The spermatogonial cells has been exclude of 3-6 days new-born mice and flow cytometry approved these cells.

Culture on scaffolds done for 14 days in four groups: (SSC + basic medium), (SSC + Silk scaffold), (SSC + graphen oxide nanocomposite scaffold) and (SSC + Silk scaffold + graphen oxide nanocomposite scaffold).

Results showed that the expression of PLZF and ID4 of SSCs were all higher for up to 14 days for SSCs cultured on the (SSC + Silk scaffold + graphen oxide nanocomposite scaffold) and had significant increase than other scaffold groups (*p* < 0.05). In summary, we have developed a scaffold that displays in vitro biocompatibility, which may have potential use for SSCs proliferation in vitro. This three-dimensional scaffold is applicable for culturing and encapsulation of spermatogonial stem cells.

**Keyword**: Spermatogonial stem cell, silk Scaffold, Three-dimensional, Proliferation, Graphen oxide nanocomposite