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POSTER

Organic-inorganic Biomaterials promote mesenchymal stem cell proliferation and differentiation for long-term cultivation

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Abstract

Background: A nifty propagating of mesenchymal stem cell (MSCs) diligence has germinated all over the world by innovative investigators. However, the clinical and basic research applications of MSC requires novel finding biomaterials interfacial interaction especially in sustainable the morphology, physiology, multipotent and phenotypically in long-term cultivation. A prominent of biomaterials benefit to MSCs culture has triggered the multitudinous field especially in regenerative medicine. In order to hinder the deprivation of MSCs in purity and potency, the alternative cell-substrate materials of MSCs culture is essentially to be discovered.
This has instigated the idea to encountered the method of screening libraries organic and inorganics biomaterials in bio-adhesively, free ethically, and sustainability to support the morphologically, physiologically, multi-potent and phenotypically of substrates coating cover slip.

Methods: Libraries of inorganic biomaterials substrates have been collected from co-researcher to conduct the initial screening phase of 100 myriad fabrications of substrates whereas enumerated as a Graphene Oxide (GO), Hydroxyapatite (HAp), and Bioactive Glass (BAG) coated cover slip and discs also several organic biomaterials. Wharton's Jelly derived Mesenchymal Stem Cells (WJMSCs) and Denuded Amnion Mesenchymal Stem Cells (AMMSCs) have been seeded on each substrate in the 48-well plate. Top four leading substrates have been selected for further cultivation until up to 5 passage (>P5) for long term screening known as scaling up phase. Several parameters such as cell attachment, cell viability, kinetic growth, cell-materials osteogenic and adipogenic differentiation and cell phenotype have been analyzed. Top one cell-material culture will go forward to further long-term cultivation up to Passage 10(>P10).

Results: Morphologically and phenotypically demonstrated that GOy1WJMSC showed the significance result among others.

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Keywords

Wharton's jelly derived mesenchymal stem cell, denuded amnion, graphene oxide, hydroxyapatite, bioactive glass, long-term screening

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