

2D DNA nanoporous scaffold promotes osteogenic differentiation of pre-osteoblast

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Abstract

Biofunctional materials with nanomechanical parameters similar to bone tissue may promote the adherence, migration, proliferation, and differentiation of pre-osteoblasts. In this study, deoxyribonucleic acid (DNA) nanoporous scaffold (DNA-NPS) was synthesized by the polymerization of rectangular and double-crossover (DX) DNA tiles. The diagonally precise polymerization of nanometer-sized DNA tiles (A + B) through sticky end cohesion gave rise to a micrometer-sized porous giant-sheet material. The synthesized DNA-NPS exhibited a uniformly distributed porosity with a size of 25 ± 20 nm.

Received: June 07, 2022; **Accepted:** June 14, 2022; **Published:** June 28, 2022

Biography

Baig, MMFA is a registered Pharmacist and did a PhD in Chemistry. His recent research interest is designing nanomaterials for Biomedical Engineering, Mechano Pharmacology, Developmental Biology, Structural Biology, and Neuroscience. He got his post-doctoral training in Nanomedicine at the Faculty of Dentistry, The University of Hong Kong. His postdoctoral work was focused on designing DNA-based functional & bio-active nanomaterials to apply in Restorative Dentistry, Oral Microbiology/Oncology, Regenerative Therapeutics, Stem Cells Research, Drug Delivery, and Molecular Pharmaceutics. He got a Ph.D. degree in Chemistry

(Therapeutic Biochemistry) from the School of Chemistry and Chemical Engineering, Nanjing University (NJU), China. During his Ph.D., he worked on DNA Nanotechnology, Nano-Therapeutics, Biosensing, Bio-imaging, Diagnostics, and Cellular Biophysics. Previously, He received his Doctor of Pharmacy (PharmD) and MPhil (Pharmaceutical Chemistry) degrees from the Faculty of Pharmacy, Bahauddin Zakariya University (BZU), Multan, Pakistan; where he learned about Biochemistry, Phytochemistry, Pharmacognosy, Biotechnology, Polymers, Organic, Medicinal, Bio-analytical, and Material Chemistry