

35. Title: A 3D Bioprinted Scar Tissue Model

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Keywords: Bioprinted scar tissue

Domain: Healthcare (Medical Device)

Summary: This technology relates to a bio-ink composition and a 3D bio printed scar tissue model is developed which closely replicates the physiological and architectural characteristics of naturally occurring scar tissue. This human cell based in vitro diseased skin model will help in drug/cosmetic screening, eliminating animal models.

Advantages:

- » 3D bioprinted in vitro scar tissue which demonstrates precise simulation of the complex 3D architecture, number of layers and cells corresponding to the tissue of interest that showed similarity with the in vivo like gene and protein expression.
- » 3D bioprinted scar tissue can be customized for a specific target site by using the desired cell-type
- » It is successful in replicating the following important in vivo characteristics:
 - i. cellular alignment and precise control over orientation of newly synthesized ECM fibrous proteins,
 - ii. presentation of specific biochemical signals, their sustained and controlled release,
 - iii. controlled contractility of cells will lead to development of precise spatiotemporally controlled morphogen gradient, in order to replicate specific stages of scar in the context of specific tissue type.
- » Bioprinted scar tissue can significantly reduce the need for unnecessary killing of animals in laboratories.

Applications: Lifesciences (Biologics)

Scale of Development: In vitro studies have been done

Technology Readiness Level: 4

IP Status: Indian Patent Application 201711043083, US Patent Application 16/768,819, EP Patent Application 18882941.0