

AB012. Formation of scaffold-free cell sheet with eye-related cells for ophthalmic application

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Abstract: The translation of current tissue engineering approaches to clinical application is somehow limited by the use of scaffolding materials. Recently a number of *in vitro* scaffold-free three-dimensional culture techniques have been developed. These techniques realize the assembly of tissue-like structures including but not limited to spheroids, blood vessels and cartilage. In particular, cells can now self-assemble to form planar tissue-like structures at the interface of an aqueous-two-phase system (ATPS). The unique advantage of this technique is that without a solid substrate, planar tissue-like structures can now be assembled rapidly with very simple procedures. This technique can potentially be very useful for tissue engineering in eye because of its ability to direct cells to form monolayer. In this talk, we will introduce what ATPS is and its current applications in biomedical research. We will then present an approach to assemble cell sheets in ATPS using both primary cells isolated from porcine eyes and other cell lines. The physiological relevance of these eye-related cell sheets as well as their potentials in ophthalmic research and applications will be discussed.

Keywords: Aqueous-two-phase system (ATPS); self-assembly; scaffold-free cell sheet

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