

Conference Name: Osaka International Conference on Research in Life-Science & Healthcare, 26-27 September 2026
Conference Dates: 26-Sep- 2026 to 27-Sep- 2026
Conference Venue: Hotel MyStays Shin-Osaka Conference Center, Osaka, Japan
Appears in: LIFE: International Journal of Health and Life-Sciences (ISSN 2454-5872)
Publication year: 2026

Simranjeet Kaur, 2026

Volume 2026, pp. 131-132

DOI- <https://doi.org/10.20319/icrlsh.2026.131132>

This paper can be cited as: Kaur, S. (2026). Development of Regenerative Bigel-Based Scaffolds and Nutrient Systems for Scalable Cultivated Meat Production. Osaka International Conference on Research in Life-Science & Healthcare, 26-27 September 2026. Proceedings of Healthcare and Biological Sciences Research Association (HBSRA), 2026, 131-132

DEVELOPMENT OF REGENERATIVE BIGEL-BASED SCAFFOLDS AND NUTRIENT SYSTEMS FOR SCALABLE CULTIVATED MEAT PRODUCTION

Simranjeet Kaur

PhD Dept of Chem Eng FT MIBTP, University of Birmingham, United Kingdom
slcomboss.h@gmail.com

Abstract

Cultivated meat holds the potential to solve the environmental and ethical challenges of conventional livestock rearing but falls behind in terms of scalability because of the expense and volatility of many key input materials, particularly culture media and structural scaffolds. The PhD project seeks to create affordable ingredients that are regenerative and food-grade, comprising several elements merged to offer nutrition and structure in the context of cultivated meat creation. These novel ingredient systems aim to replace expensive and labile ingredients with more robust, scalable counterparts that can support a variety of meat cell types in bioreactor culture.

Initial work has concentrated on the design and characterisation of hydrogel-oleogel hybrid matrices (bigels) as scaffolding and fat mimetics. The systems were prepared in varied hydrogel-to-oleogel ratios, and their microstructural, rheological, and thermal behaviour was probed to ascertain the influence of phase composition on functional performance. The results contribute to

a basic understanding of bi-phasic gel behaviour and open up possibilities for the development of tailored matrices for use in cultivated meat.

The later stages of the project will integrate these bigel systems with the regenerative nutrient formulations under development in parallel and test their combined functionality in model meat constructs. Specific emphasis will be placed on ingredient shelf life, process compatibility, and contribution to reduced overall production costs. This work will address two essential bottlenecks that currently impede the commercialization of cultivated meat: ingredient sustainability and system stability.

Keywords:

Cultivated Meat, Bigels, Food-Grade Scaffolds, Regenerative Ingredients, Sustainable Bioprocessing