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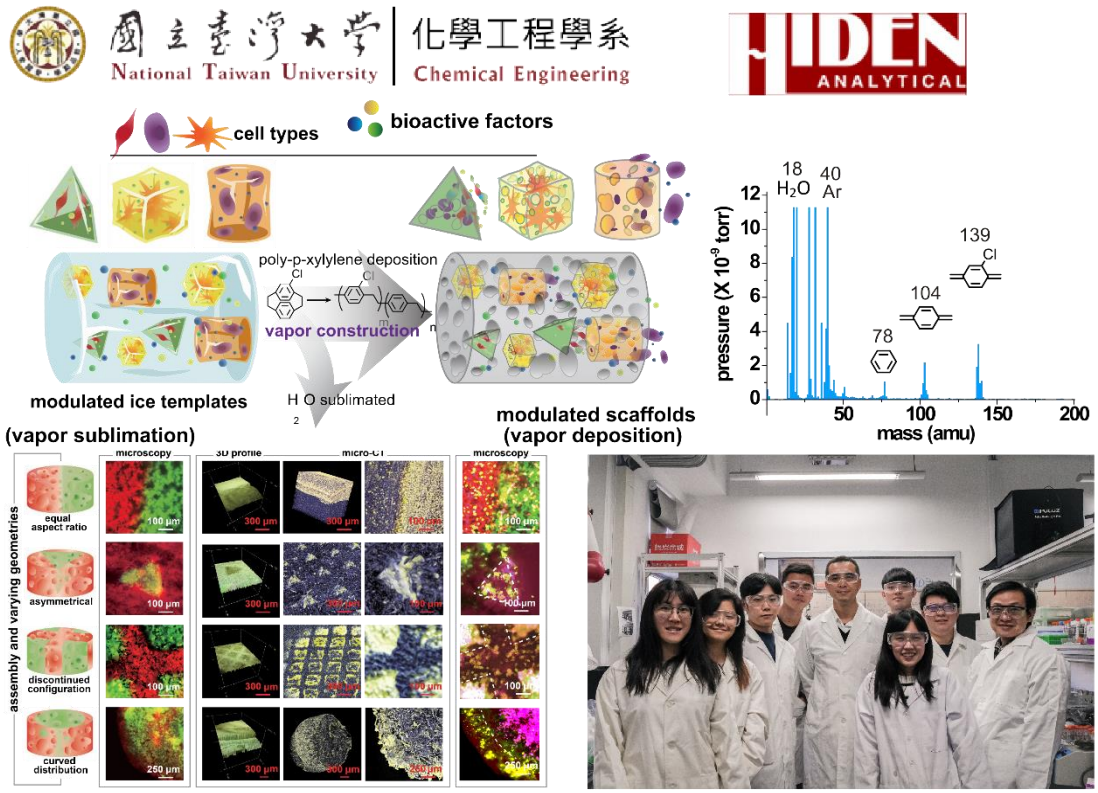
A vapor-phase technology of fabrication and modulation of scaffolding materials using a Hiden Analytical RGA discovered by the research team of National Taiwan University was published in 《Nature Communications》

Modular approaches are used to produce scaffolding materials for tissue engineering have delivered promising results for bottom-up methods, which show superior advantages, including more complex molecular and structural flexibility allowing for multifunctional assembly both in physical and chemical aspects to better mimic the native extracellular matrix (ECM). However, challenges ranging from cell-cell aggregation, distribution and localization of multiple types of cells, co-culture of cell types, distribution and localization of biomolecules, limited and potential immune-responsive materials, lack of surface modification of materials to the control of cell-material interactions, remain unanswered.



Modulated tissue engineering scaffolds: schematic illustration of the vapor-phased fabrication and modulation process, and the results of the research work. The bottom-right photo is the interdisciplinary research team lead by Prof. Hsien-Yeh Chen.

An interdisciplinary research team lead by Prof. Hsien-Yeh Chen across the Department of Chemical Engineering, the Advanced Research Center for Green Materials Science and Technology, and the Molecular Imaging Center in National Taiwan University (NTU), has found a new fabrication process of scaffold materials that are comprised of multiple biomolecules and living cells with built-in boundaries separating the distinct compartments containing defined biological configurations and functions. They show a control mass transport of species in vapor sublimation and deposition

conditions to fabricate the scaffolds and demonstrate a mass production potential of such a process. In their research results, the new fabrication process and the advanced scaffolds exhibited extreme biocompatibility, enhanced cell proliferation, osteogenesis, and neurogenesis, which can be assembled into various geometric configurations, and was able to perform cell co-culture experiments to show independent osteogenesis and angiogenesis activities from separate compartments in one scaffold construct.

The core researchers also include Dr. Chih-Yu Wu, a senior research fellow of the Molecular Imaging Center of NTU, Ting-Ying Wu, a Ph.D. student of the Department of Chemical Engineering of NTU, and Prof. Chao-Wei Huang, an assistant professor of Department of Tropical Agriculture and International Cooperation of National Pingtung University of Science and Technology. The research results were published in the internationally renowned scientific journal *Nature Communications* in June 2021. The use of this technology to produce complex and multifunctional tissue engineering scaffold materials in various fields of regenerative medicine is currently under research, and it is expected that more types of functional scaffold products can be created in the near future. For detailed scientific research results, please refer to the full text of the official publication. "Vapor-phased fabrication and modulation of cell-laden scaffolding materials", 2021 June, DOI: 10.1038/s41467-021-23776-8.

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Hiden Product:
RGA Series