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Takara Bio launches first commercial dissolvable microfluidic lentiviral transduction enhancer

07 May 2024 | News

Lenti-X Transduction Sponge safely replaces and solves the issues inherent to spinoculation, chemical enhancers, and microfluidic devices

Takara Bio USA, Inc., a wholly owned subsidiary of Japan-headquartered Takara Bio Inc., has announced the launch of the Lenti-X Transduction Sponge, a first-to-market dissolvable microfluidic transduction enhancer that innovates in vitro lentivirus-mediated gene delivery techniques.

With an easy, walkaway workflow, the Lenti-X Transduction Sponge achieves high transduction efficiency in any cell type, enabling downstream research applications in the gene and cell therapy space.

Takara Bio USA developed the transduction sponge in collaboration with Dr Yevgeny Brudno, Associate Professor at the School of Pharmacy and the Department of Biomedical Engineering at the University of North Carolina and North Carolina State University.

Several limitations in current methods make lentiviral transductions cumbersome. For example, spinoculation—the use of a centrifuge to bring lentivirus and cells in closer proximity—and chemical enhancers are commonly used techniques to increase transduction efficiency. However, these methods are either time-intensive or work in a cell-type-specific manner, requiring optimisation. Microfluidic systems, which improve cell-virus contact by spatially constraining cells and virus to small areas, have until now required special chips and hardware to facilitate the flow through microfluidic channels.

The Lenti-X Transduction Sponge safely replaces and solves the issues inherent to spinoculation, chemical enhancers, and microfluidic devices. Made from calcium-crosslinked alginate, a biomaterial with high biocompatibility, the sponge increases transduction efficiency by colocalizing target cells and virus within its macroporous 3D structure. After transduction, cells are gently released by dissolving the sponge with a supplied buffer, resulting in high cell viability and preservation of cellular phenotype. The easy-to-use workflow maximises transduction efficiency across an array of cell targets including human primary T cells, CD34+ hematopoietic stem cells, natural killer cells, cells in suspension, and adherent cell lines.