

**Docket #:** S13-057

# **DICE: dual-integrase cassette exchange**

Stanford researchers have patented a system for precise genetic modification of human embryonic stem cells (ECs) and induced pluripotent stem cells (iPSCs). The system known as DICE (dual integrase cassette exchange) is a robust and easily repeatable two-step process for placement of any genes into human pluripotent stem cells. (See DICE Technique Schematic). DICE offers complete control over the content, orientation and copy number of gene insertion and is expected to have no size limits. The level of specificity of DICE is approximately 100 percent and correct integrants are obtained with a single transfection of a moderate number of cells. This robust system is particularly suited for construction of cell lines and transgenic organisms with potential applications in gene therapy and regenerative medicine.

## **Applications**

- Genetic engineering
- Gene addition in animal, plant, and microbial cells
- Construction of transgenic organisms

## **Advantages**

- Precise, efficient method for inserting genes at a preselected genomic location without a size limit
- Eliminates background events
- Little or no screening required
- Cost effective
- Time saving

## Publications

- Calos, M. P., Tsai, R. Y., Zhu, F., Gamboa, M., Farruggio, A. P., Hippenmeyer, S., Tasi, B., & Schüle, B. (2018). *U.S. Patent No. [9,932,607](#)*. Washington, DC: U.S. Patent and Trademark Office.
- Zhu, F., Gamboa, M., Farruggio, A. P., Hippenmeyer, S., Tasic, B., Schüle, B., Chen-Tsai, Y., & Calos, M. P. (2014). [DICE, an efficient system for iterative genomic editing in human pluripotent stem cells](#). *Nucleic acids research*, 42(5), e34-e34. <https://doi.org/10.1093/nar/gkt1290>

## Patents

- Published Application: [20150140665](#)
- Published Application: [WO2015073703](#)
- Issued: [9,932,607 \(USA\)](#)

## Innovators

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