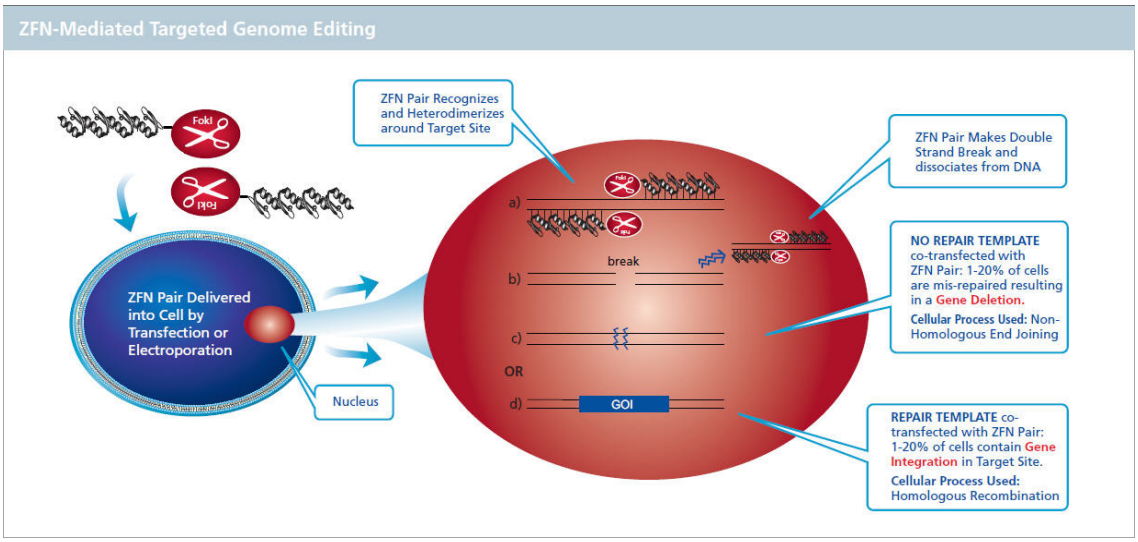
Technical Seminar

# Targeted Genome Editing with Zinc Finger Nucleases

Date: Thursday, February 5, 2009 16:00–17:00
Venue: RIKEN Center for Developmental Biology A7F Seminar Room
Speaker: Yoshihisa Sugimoto, Ph.D. , Supervisor, Techinical Sales Development, Sigma-Aldrich Japan K.K.

Summary: Rational genome engineering in mammalian cells is of enormous potential across basic research, drug-discovery as well as cell-based medicines. To this end, Sangamo Biosciences and Sigma-Aldrich have recently partnered to commercialize a novel technology that enables high-frequency genome editing via the application of designed zinc finger nucleases (ZFNs). Within these chimeric proteins the DNA binding specificity of the zinc finger protein determines the site of nuclease action. Such engineered ZFNs are able to recognize and bind to a specified locus and evoke a double-strand break (DSB) in the targeted DNA with high efficiency and base-pair precision. The cell then employs the natural DNA repair processes of either "homology-directed repair (HDR)" or "non-homologous end joining (NHEJ)" to heal the targeted break. These two pathways provide the investigator with the ability to provoke three unique outcomes in genome editing – gene correction, gene deletion and targeted gene addition. Furthermore, the speed and efficiency of this process enables us to knockout multiple genes in the same cell. Drawing from our work with transformed cell lines, primary human cells, and multi-potent stem cells, we will present several examples of single, double and triple gene knockout, as well as targeted gene insertion into native chromosomal loci.

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