CRISPR’s challenge: It’s still easier to subtract genes than it is to add them

Almost always, building something is harder than tearing it down. Similarly, knocking in genes poses a greater challenge than knocking them out. It’s a reality that researchers will have to overcome in order to get the most out of gene editing.

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In the past few years, researchers have developed many new strategies to boost the efficiency of knocking in genes both large and small using CRISPR-Cas9, and along the way they’ve proposed and tested new applications for this type of gene editing. Here, The Scientist explores a few of the most promising approaches.

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Researcher: Channabasavaiah Gurumurthy, director of the mouse genome engineering core facility, University of Nebraska Medical Center

Project: A few years ago, musing over the difficulty of knocking in genes while trying to do so into mouse zygotes, Gurumurthy and his colleagues had a revelation.

Researchers were successfully inserting short, single-stranded DNA, so why not try making a knock-in by inserting long, single-stranded DNA? Indeed, the approach, which Gurumurthy calls Easi-CRISPR (efficient additions with ssDNA inserts -CRISPR), boosts efficiency by 2.5 times, and using single-stranded DNA slashes the rate of off-target insertions 100-fold in cell culture.

Read full, original post: The Challenge of Using CRISPR to Knock In Genes