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CRISPR-PCS: An efficient and versatile chromosome splitting technology in *Saccharomyces cerevisiae*

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PCR-mediated chromosome splitting (PCS) was developed in the yeast *Saccharomyces cerevisiae*. It is based on homologous recombination and enables division of a chromosome at any point to form two derived and functional chromosomes. However, because of low homologous recombination activity, PCS is limited to a single site at a time, which makes the splitting of multiple loci laborious and time-consuming. Here we have developed a highly efficient and versatile chromosome engineering technology named CRISPR-PCS that integrates PCS with the novel genome editing CRISPR/Cas9 system. This integration allows PCS to utilize induced double strand breaks to activate homologous recombination. CRISPR-PCS enhances the efficiency of chromosome splitting approximately 200-fold and enables generation of simultaneous multiple chromosome splits. We propose that CRISPR-PCS will be a powerful tool for breeding novel yeast strains with desirable traits for specific industrial applications and for investigating genome function.

Biography

Saeed Kaboli has completed his PhD and Postdoctoral degrees in Department of Biotechnology, Osaka University, Japan. Presently, he is a Postdoctoral Researcher in Sciences and Biological Technologies, Shahid Beheshti University, Iran. Also, he is engaged in a project entitled "Development of novel genome engineering technology and its application in bioscience and biotechnology".

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