



## FOCUS: BIOTECHNOLOGY

### Zinc Finger Proteins

Dow AgroSciences' June 2008 announcement that it had exercised early its option to obtain a commercial license to Sangamo BioSciences Zinc Finger Protein (ZFP) technology, left many people wondering what all the excitement was about. What was the "tremendous success of the research program in plants" and why should it matter to me?

Sangamo and Dow AgroSciences have been collaborating since October 2005 to apply ZFP technology to plants, and two significant achievements in 2008, the generation of specific traits in corn and canola, demonstrated the applicability of this technology to major crops of interest.

#### *So what did the researchers do?*

In corn, they used ZFP nucleases to place a herbicide resistance gene into a specific location in the maize genome in a single step process. The precise insertion of the gene is a significant step towards having the ability to stack traits at a single target site in the genome. This ability could significantly benefit breeders and trait developers by accelerating the process of 'trait stacking', which will result in a shorter path to commercialization of crops containing new traits.

In canola, Sangamo's ZFP transcription factor technology was used to control the expression of a native gene involved in a key step of oil biosynthesis and to change the metabolic profile of the plant tissue.

ZFPs are the dominant class of naturally occurring transcription factors in organisms from simple yeasts to complex plants and animals. While all transcription factors bind to DNA and regulate gene expression, only ZFPs can be engineered and can precisely target a particular gene of interest. Synthetic ZFP nucleases or transcription factors can theoretically be engineered to target any gene in the plant genome.

According to a recent Dow AgroScience press release, in addition to developing its own new products using the ZFP technology, Dow AgroSciences will sublicense the technology to third parties for development of particular products under the trademark name of EXZACT(TM) Precision Traits.

#### *Why should you be interested?*

This technology matters because it has the potential to revolutionize the way genes are modified and the way they are inserted – targeted as opposed to randomly. In addition, if no "DNA footprint" is left in the plant DNA, the resulting plant could be eligible for a much reduced deregulation process.



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