Press release

Hudson River Biotechnology and Gen-X deliver Proof of Concept for SuRE technology in plants

Wageningen, 30 October 2018 - Two Netherlands-based start-ups take major technological step in precision plant breeding, by showing that the SuRE technology can be successfully applied to the tomato genome, delivering a new genetic target identification platform for use in agricultural crops.

SuRE, 'Survey of Regulatory Elements', is a highly novel platform technology that allows unbiased genome-wide identification of gene regulatory elements that can serve as targets for mutagenesis. Through SuRE, we can identify unique and proprietary (patentable) targets that we can modify to yield new traits. SuRE outperforms competing technologies by a wide margin and has valuable agricultural applications, such as the identification of novel, unique and sophisticated targets for molecular plant breeding through targeted mutagenesis approaches. The technology is patent pending and was invented by Gen-X's founder and published in the journal Nature Biotechnology, in 2017. HRB has partnered with Gen-X to translate the SuRE platform technology from validated pharmaceutical applications to new agricultural applications. These include the identification of novel, unique and sophisticated targets for molecular plant breeding through targeted mutagenesis approaches (TILLING and other **gene-editing** methods like **CRISPR**), as well as of novel, strong endogenous promoters to drive cis- and transgene expression.

Proof of Concept for SuRE in plants
With SuRE, a plasmid library is constructed, consisting of random genomic fragments inserted upstream of unique 20-bp barcodes. The library is transfected into protoplasts, and barcode expression is quantified by high-throughput sequencing. Over 50-fold genome coverage can be reached, allowing robust mapping of autonomous promoter and enhancer activity to a genome.

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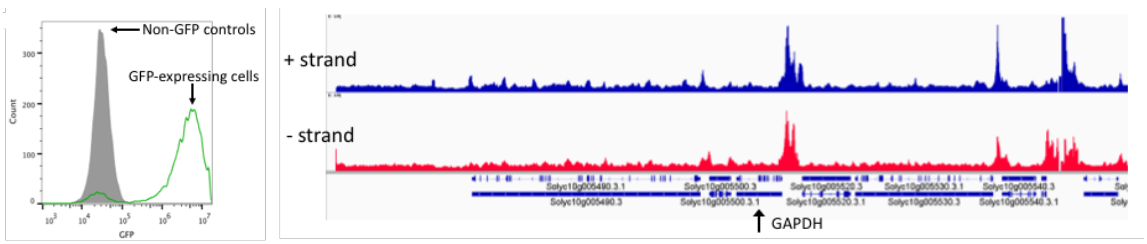

Left: Flow cytometry image of tomato protoplasts transfected with SuRE library vector driving GFP expression. Right: SuRE tracks for a locus surrounding the GAPDH gene (encoded on minus strand; indicated with arrow) in tomato.

In a project supported by Syngenta, Vegetable Seeds from BASF (Nunhems Netherlands), HZPC Research BV and Genetwister, HRB and Gen-X were able to show that the SuRE platform technology can be successfully applied to the tomato genome. The figure above shows that the SuRE library vector can be used to assay transcriptional regulation in tomato, and that when tomato genomic DNA is analyzed, a clear peak pattern is observed, representing gene regulatory elements.

"We are excited about achieving this major technical milestone. The combination of the proprietary SuRE and CRISPR technology platforms offers a powerful and unique way for plant breeders to improve crop yields and enable more sustainable food production" says Rudi Ariaans, CEO and co-founder of HRB.

For more information, please contact:

Hudson River Biotechnology B.V.
Rudi Ariaans
CEO
Rudi.ariaans@hudsonriverbiotechnology.com
Tel: +31.6.8011.4388
www.hudsonriverbiotechnology.com

About:

Hudson River Biotechnology is a highly innovative agricultural biotech company located in Wageningen (Netherlands) focused on improving crop productivity and quality, addressing the world's increasing demand for food and natural ingredients. We do this by genetically optimizing crops to increase yields, improve disease resistance & nutritional value.

Gen-X is a biotechnology company located in Amsterdam that provides functional genome annotation on an unprecedented scale using the SuRE technology (**www.gen-x.bio**). We enable the identification of relevant regulatory DNA elements and provide functional annotation of non-coding sequence variants.

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