

Landes Highlights

Recombinant human influenza vaccine produced in tobacco cells

In this study, the authors characterized a recombinant influenza haemagglutinin antigen (HAC1) that was derived from the 2009 pandemic H1N1 (pdmH1N1) virus and expressed in tobacco plants.

Volunteers vaccinated with the 2009 pdmH1N1 oil-in-water adjuvanted vaccine provided serum and lymphocyte samples that were used to study the immunogenic properties of the HAC1 antigen in vitro. Seven days post vaccination, the vaccine fulfilled the licensing criteria for antibody responses:

ELISA and ELISPOT analysis showed that HAC1 was recognized by specific serum antibodies and antibody secreting cells. T-cell reactivity was also observed.

This study shows that production of recombinant antigens in plants can be a quick, cost effective and up-scalable new strategy for influenza vaccine production.

Reference

1. Jul-Larsen A, Madhun AS, Brokstad KA, Montomoli E, Yusibov V, Cox RJ. The human potential of a recombinant pandemic influenza vaccine produced in tobacco plants. *Human Vaccines and Immunotherapeutics* 2012; 8:653-661; <http://www.landesbioscience.com/journals/13/article/19503/>.

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In this issue:
Portrait of a leading vaccinologist: Peter Lawaetz Andersen

LANDES BIOSCIENCE

Insect-resistant vegetables

In this review, Anthony Shelton of Cornell University gives an excellent summary on genetically engineered (GE) insect-resistant crops that express proteins from *Bacillus thuringiensis* (Bt).

The first Bt vegetable was developed by Fischhoff et al.² who engineered tomato plants resistant to tobacco hornworm and the tomato fruitworm. Following this study, many other Bt vegetables have been developed but only potatoes and sweet corn have been commercialized, and only sweet corn remains on the market. Meanwhile, the area planted with Bt field crops (cotton and corn) continues to increase.

While consumer preference is often suggested as a major reason for consumers not purchasing GE crops, in truth, consumers have had little opportunity to make such a choice. Either the GE products are not available to them (e.g., Bt tomatoes) or the products they purchase (e.g., cereals) are not labeled, so they are unaware of ingredients from GE crops.

Reference

1. Shelton A. Successes, disappointments, challenges and ways to move forward. *GM Crops Food* 2012; 3:175-183; <http://www.landesbioscience.com/journals/gmcrops/article/19762/>.
2. Fischhoff DA, Bowditch KS, Perlak FJ, Marrone PG, McCormick SM, Niedermeyer JG, et al. Insect Tolerant Transgenic Tomato Plants. *Nature Biotechnology* 1987; 5:807-13; <http://dx.doi.org/10.1038/nbt0887-807>.

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LANDES BIOSCIENCE

Engineering antibodies

Over the past ten years, monoclonal antibodies (mAbs) have taken center stage in the field of targeted therapy and diagnosis. In their excellent review of the literature, Ducancel and Muller present the latest molecular engineering results on mAbs with therapeutic and diagnostic applications.

More and more Abs are being approved for the market, with hundreds more currently under clinical evaluation; making this category of proteins one of the more promising therapeutic molecules. Most of the results obtained to date with intact immunoglobulins are extended and applied to Ab fragments, fusion Ab-derived compounds, and also to alternative scaffolds, or intrabodies, providing researchers and clinicians with a large panel

of new compounds with which to respond to current therapeutic, diagnostic and imaging requirements. However, many challenges still remain to be addressed in designing more accurately defined and affordable therapeutic Ab-based compounds. Despite the potential of molecular engineering in developing better therapeutics, this family of proteins will expand further into the clinical market only when the recombinant strategies of expression are more controlled and less costly.

Reference

1. Ducancel F, Muller BH. Molecular engineering of antibodies for therapeutic and diagnostic purposes. *mAbs* 2012; 4:445-457; <http://www.landesbioscience.com/journals/mabs/article/20776/>.

