



# PBL NEWS



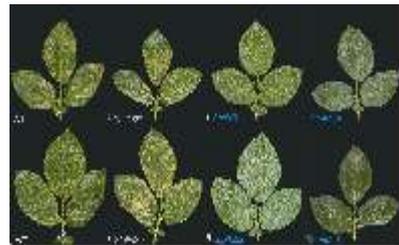
PBL News - Issue 13 - May 2008

## Major Crop Technology Licensed



Plant Bioscience Limited (PBL) is delighted to announce that it has entered into a major licence agreement with a leading plant biotechnology company in respect of a new technology for enhancing the performance of crops.

The Flavodoxin technology was developed by Professor Nestor Carrillo and colleagues at the Institute of Molecular and Cellular Biology of Rosario (IBR/CONICET), School of Biochemistry, Universidad Nacional de Rosario, Argentina. PBL has been managing the protection and development of the Flavodoxin intellectual property on behalf of the inventors since 2001. The Flavodoxin protein protects the plant's sensitive photosynthetic machinery from disruption during times of stress and unfavourable growing conditions. The licensee company has been testing the technology for three years, and it is now progressing to the development stage. The licence from PBL, which includes milestone fees and royalties, grants exclusive commercial rights to develop new generations of crops in ten species including maize, soybeans, cotton, oilseed rape and rice.



Flavodoxin has now shown clear benefits to plant performance in a wide range of plants. Moreover, Prof Carrillo's group has elucidated the underlying biological mechanism to explain why this protein, from blue-green algae, compensates for the fragility of the photosynthetic machinery of higher plants under many forms of stress and this work is now published (see references). Prof Carrillo's research group is supported by CONICET, the National Research Council of Argentina.

PBL's Managing Director, Dr Jan Chojecki, said "We are delighted that our commercial partner is now taking this technology forward as they are very well equipped to ensure the delivery of crops with Flavodoxin into widespread agricultural use around the world. Prof Carrillo and his team are a great example of how continued academic research can greatly assist in the technology transfer process". Dr Chojecki added, "Most crops face environmental stresses at some stage of the growing season, whether in agricultural heartlands or in marginal areas, and through our licensee's activity the Flavodoxin technology will bring enormous benefits. Given that we now know the technology works so well in widely different plant species, we are still looking for commercial developers for the many plants not included in the new licence agreement."



Prof Carrillo said "We are pleased by this outcome of our research for a number of reasons. First, the discoveries made were the result of fundamental investigations on basic biological issues carried out in a public University and supported by the National Research Council (CONICET) and other governmental agencies. Although we were always aware of the potential applications and their importance, the primary motivation to

initiate the project was sheer curiosity and the burning desire to understand a very strange feature of life on earth. The outcome highlights the importance of state-sponsored basic research and its social value, especially in developing countries as Argentina. In addition, the relationship with PBL has been extremely enriching, one of reciprocal strengthening and mutual benefit. Their contribution was critical during all stages of the process. PBL was all-important in converting an idea into a valuable outcome with widespread benefits. We would have been unable to accomplish that task on our own."

### References for FLAVODOXIN

- Functional Replacement of Ferredoxin by a Cyanobacterial Flavodoxin in Tobacco Confers Broad Range Stress Tolerance. Tognetti V, Palatnik J, Fillat M, Melzer M, Hajirezaei M-R, Valle E and Carrillo N. *The Plant Cell* (2006): 18(8).
- Enhanced plant tolerance to iron starvation by functional substitution of chloroplast ferredoxin with a bacterial flavodoxin. Tognetti VB, Zurbriggen MD, Morandi EN, Fillat MF, Valle EM, Hajirezaei M-R and Carrillo N. *PNAS* (2007): Vol 104 No. 27 pp 11495-11500.
- Detoxification of 2,4-dinitrotoluene by Transgenic Tobacco Plants Expressing a Bacterial Flavodoxin. Tognetti VB, Monti MR, Valle EM, Carrillo N and Smania AM. *Environmental Science and Technology* (2007): No 41 Issue 11 pp 4071-4076.
- Stress-inducible Flavodoxin from Photosynthetic Microorganisms. The Mystery of Flavodoxin Loss from the Plant Genome. Zurbriggen MD, Tognetti VB, Carrillo N. *IUBMB Life* (2007): 59 (4-5) pp 355-360.
- Cyanobacterial Flavodoxin Provides Multiple Stress Tolerance. Zurbriggen M, Tognetti VB, Valle EM, Carrillo N. *Agricultural and Environmental Biotechnology* (2007): ISB News Report pp 1-4.

IP protection

Funds and manages patent filing and prosecution

Builds complementary technology packages

Markets technology to commercial users

Concludes and monitors technology licences

Manages and mentors the formation of new technology-based business

## Innovation in life sciences

PBL, Norwich Research Park, Colney Lane, Norwich, Norfolk NR4 7UH, UK  
Tel: +44(0)1603 456500 Fax: +44(0)1603 456552 [www.pbltechnology.com](http://www.pbltechnology.com)

