Plant-derived Recombinant Proteins: Building a Business from University Research

Maurice M. Moloney

Maurice M. Moloney, Founder and Chief Scientific Officer, SemBioSys Genetics Inc., 2985-23rd Avenue NW., Calgary Alberta T1Y 7L3

Plants are the most efficient producers of protein on the planet. In recent years, it has proven possible to transform plants with genes encoding a wide range of recombinant proteins for use in pharmaceutical and industrial applications. SemBioSys Genetics Inc. is a leader in developing this technology in oilseeds. The original technology for this company is based on research into the subcellular targeting of proteins in oilseeds. This has developed into a broad-based solution for the production of recombinant proteins in oilseeds and, in particular, for the inexpensive purification of these proteins.

There have been several major challenges in developing this work in a BioVenture. First, it has been necessary to demonstrate the range of proteins (animal, plant, microbial) that can be expressed using this system. Second, it has been essential to protect the technology through broad patents. Third, it has been critical to develop the system at pilot-scale or larger to demonstrate the industrial robustness of the technology. Finally, it has been desireable to expand the applicability of the technology to complex, oligomeric proteins as well as simpler polypeptides.

In this presentation, the founding technology will be described and evaluated and the evolution of this technology into the basis of a functioning company will be critically reviewed.

Maurice M. Moloney

Nationality: Ireland
Position: Founder and Chief Scientific Officer
SemBioSys Genetics Inc.
110, 2985-23rd Avenue NE
Calgary, Alberta T1Y 7L3
Phone: +1(403)250-5424 x40
Fax: +1(403)250-3886
E.mail: moloneym@sembiosys.ca

FINAL EDUCATION (Ph. D.)

1979	Plant Physiology, Leicester Polytechnic

EMPLOYMENT

2002	Appointed to the Natural Sciences and Engineering Research Council of Canada (NSERC) for a three year term
1995 - Present	Professor, NSERC/Dow AgroSciences Industrial Research Chair of Plant Biotechnology, University of Calgary, Dept. of Biological Sciences
1994 - Present	Founder and Chief Scientific Officer, SemBioSys Genetics Inc.
1990 - 1995	Associate Professor, University of Calgary, Dept. of Biological Sciences
1986 - 1990	Assistant Professor, University of Calgary, Dept. of Biological Sciences
1983 - 1986	Principle Scientist and Coordinator, Calgene Inc., Cell Biology Group
1979 - 1983	Royal Society European Postdoctoral Fellow, University of Lausanne, Institut de Physiologie et de Biologie Vegetales
1979 - 1979	Research Assistant, Leicester Polytechnic

RESEARCH PUBLICATIONS

Seon J.H, Szarka S.J, Moloney M.M (2002) A Unique Strategy for Recovering Recombinant Proteins from Molecular Farming: Affinity Capture on Engineered Oilbodies *Journal of Plant Biotechnology* 4(3) pp. 95-101.

Abell B.M, High S, and Moloney M.M (2002) Membrane Protein Topology of Oleosin is Constrained by its Long Hydrophobic Domain. *Journal of Biological Chemistry*, 277 (10) 8602-8610.

Nykiforuk C.L, Furukawa-Stoffer T.L, Huff P.W, Sarna M, Laroche A, Moloney M.M, Weselake R.J (2002) Characterization of cDNAs Encoding Diacylglycerol Acyltransferase from Cultures of *Brassica napus* and Sucrose-Mediated Induction of Enzyme Biosynthesis. *Biochimica et Biophysica Acta* 1580: 95-109.