

Plant cells as factories for pharmacological proteins

SENIOR SCIENTISTS:

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Research Field and Subjects

Heterologous expression of proteins in various biological systems (microorganisms, animal cells, plant cells) is now feasible. Plants and plant cells are convenient for expressing recombinant pharmaceutical and other proteins because they represent a versatile and inexpensive system.

The research projects developed in this unit involves the understanding of the main steps that control the expression of proteins in plants: design of transformation vectors, transcription promoters, subcellular localization, protein stability. This know-how is being used for developing plant and plant cell based expression systems for heterologous expression of proteins, including pharmacological proteins.

Products and Services

- ▶ Gene cloning and heterologous expression
- ▶ Site-directed mutagenesis
- ▶ Design of transformation vectors
- ▶ Transformation of plant cells and plant for expression of heterologous proteins
- ▶ Follow-up of expression
- ▶ Purification of proteins

Main Equipment

- ▶ All present-day molecular biology and biochemistry equipments

Representative References

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- ▶ DUBY G., OUFATTOLE M. and BOUTRY M. (2001) Hydrophobic residues within the predicted N-terminal amphiphilic alpha-helix of a plant mitochondrial targeting presequence play a major role in *in vivo* import. *Plant J.* 27: 539-549.
- ▶ DUBY G., DEGAND H. and BOUTRY M. (2001) Structure requirement and identification of a cryptic cleavage site in the mitochondrial processing of a plant F₁-ATPase beta-subunit presequence. *FEBS Lett.* 505: 409-413.
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- ▶ GREC S., VANHAM D., CHRISTYN DE RIBAU COURT J., PURNELLE B. and BOUTRY M. (2003) Identification of regulatory sequence elements within the transcription promoter of *NpABC1*, a gene encoding a plant ABC transporter induced by diterpenes. *Plant J.* 35: 237-250.

Patents

- ▶ S. HAUNSO, J. CARLSEN, K. KJELDTSEN, T. JOHANSEN, P. LARSEN, U. JENSEN, S. FEY, M. BOUTRY, H. DEGAND (1999) Markers for organ rejection. PCT US 5939270.
- ▶ M. BOUTRY, Y. STUKKENS, S. GREC, M. JASINSKI (2003) Use of *NpABC1* transporter and promoter thereof, PCT/EP03/08137.

Awards

- ▶ M. Boutry, member of the Belgian Academy of Sciences

Partnership

- ▶ This group belongs to the *Institut des Sciences de la Vie*, Louvain-la-Neuve, Belgium
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STAFF

Total: 4

KEY WORDS FOR R&D

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