



Pharma-Planta achievements

Towards the clinic

1. Significant input into developing regulatory oversight for Molecular Farming in Europe (EFSA and EMEA)
2. Established a European cGMP facility for manufacture of recombinant pharmaceuticals from plants
3. Established a European / South African collaboration resulting in a MAb production platform in maize.
4. On track to complete first human clinical trial for a transgenic plant derived MAb produced by cGMP
5. 3 further MAbs (in maize and tobacco) and 1 antigen (in tobacco) poised for clinical trial development



Pharma-Planta achievements

Basic science underpinning translational developments

1. Side-by-side comparison of different plant expression systems for the same mammalian, bacterial and viral proteins.
2. New platform technologies for expression in:
 - a) different plant species
 - b) different plant tissues
 - c) different sub-cellular compartments
3. Scientific breakthroughs in understanding mechanisms of recombinant protein expression, accumulation and degradation in plants
4. New tools for analysis and monitoring recombinant protein expression in plants



Pharma-Planta achievements

Translational applications

1. Upstream development

- Improved yields
- Contained cultivation conditions for maize in S. Africa and tobacco in EU
- Establishment of a system for Good Agricultural Practice for Molecular Farming

2. Downstream development

- Development of new equipment – polytron, filters, membranes moving towards a pilot scale system
- Development of new processes
- cGMP for plant biotechnology products



Pharma-Planta achievements

Training for the future

1. Reinvigorated plant biotechnology and Molecular Farming in Europe –
 - a) A flagship project
 - b) 39 post-doctoral positions in Molecular Farming
 - c) 8 multi-disciplinary European collaborative PhDs
 - d) 3 Training days

2. A springboard for FP7