

15. GENETICALLY MODIFIED PLANTS AS PERSPECTIVE SOURCE OF BIOPHARMACEUTICALS

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Introduction. The scientific community is constantly looking for new sources of natural chemical compounds in order to elaborate effective remedies for early diagnosis and treatment of incurable diseases inherited from the previous century. Today, genetically modified plants (GMP) serve as a new source of chemical compounds used for this purpose.

Aim of study. Evaluation of the specialised bibliography and highlighting of GMP as biopharmaceutical sources.

Methods and materials. The profile literature and database (about 60 sources from PubMed, Google Scholar platforms) on GMP were evaluated and analysed.

Results. The evaluation of the modern researches denote that GMPs are used as biofactory for the new biopharmaceuticals (enzymes, recombinant proteins, monoclonal antibody, peptides, antisense oligonucleotides, hormones recombinant proteins, monoclonal antibodies and immunomodulating drugs). The list of GMP species and bioproducts obtained from them have been elucidated: *Helianthus annuus* – somatotropin hormone which is used in nanism and rapid muscle growth; *Solanum tuberosum* – lactoferrin-multifunctional protein with antimicrobial activity; *S. lycopersicon* – α -antitrypsin human protein used in liver cirrhosis, glycoprotein for Rabies virus, vaccine for respiratory syncytial virus; *Zea mays* – gastric lipase enzyme in chronic pancreatitis (the used target is endocrinology, immunology and virology that become a reality for producing harmless drugs, oral vaccines and tumour antigens). Species *Nicotiana tabaccum* has been established as a model transgenic system for molecular farming and is mostly used in pharmaceutical protein research with therapeutic and prophylactic applications in genetic disorders, cancer, HIV, hyperparathyroidism and neuronal affections. Recombinant proteins obtained by the transgenic route have an applicative character in: chronic inflammatory conditions (Protein C); blood substitute (Haemoglobin- α and - β); thrombosis (humanised Hirudin), antitrypsin in the case of surgical transplantation. The main focus is generation of edible cheap vaccines and easily administered ones that could provide mucosal immunity against infectious agents causing deaths of millions of children.

Conclusion. This rapid increase in the number of new biological compounds reflects fast progress in molecular biology and genetic engineering, highlighted by the success of the human genome project that, in turn, will help to identify a lot of additional opportunities for represent new opportunities in the early and accurate diagnosis as well as in effective and successful treatment of difficult diseases.