

1. Record Nr.	UNINA9910220038303321
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Titolo	Engineering the Plant Factory for the Production of Biologics and Small-Molecule Medicines
Pubbl/distr/stampa	Frontiers Media SA, 2017
Descrizione fisica	1 online resource (377 p.)
Collana	Frontiers Research Topics
Soggetti	Biotechnology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	<p>Plant gene transfer achieved in the early '80s paved the way for the exploitation of the potential of gene engineering to add novel agronomic traits and/or to design plants as factories for high added value molecules. For this latter area of research, the term "Molecular Farming" was coined in reference to agricultural applications in that major crops like maize and tobacco were originally used basically for pharma applications. The concept of the "green biofactory" implies different advantages over the typical cell factories based on animal cell or microbial cultures already when considering the investment and managing costs of fermenters. Although yield, stability, and quality of the molecules may vary among different heterologous systems and plants are competitive on a case-to-case basis, still the "plant factory" attracts scientists and technologists for the challenging features of low production cost, product safety and easy scale up. Once engineered, a plant is among the cheapest and easiest eukaryotic system to be bred with simple know-how, using nutrients, water and light. Molecules that are currently being produced in plants vary from industrial and pharmaceutical proteins, including medical diagnostics proteins and vaccine antigens, to nutritional supplements such as vitamins, carbohydrates and biopolymers. Convergence among disciplines as distant as plant physiology and pharmacology and, more recently, as omic sciences, bioinformatics and nanotechnology, increases the options of research on the plant cell factory. "Farming for Pharming"</p>

biologics and small-molecule medicines is a challenging area of plant biotechnology that may break the limits of current standard production technologies. The recent success on Ebola fighting with plant-made antibodies put a spotlight on the enormous potential of next generation herbal medicines made especially in the name of the guiding principle of reduction of costs, hence reduction of disparities of health rights and as a tool to guarantee adequate health protection in developing countries. Plant gene transfer achieved in the early '80s paved the way for the exploitation of the potential of gene engineering to add novel agronomic traits and/or to design plants as factories for high added value molecules. For this latter area of research, the term "Molecular Farming" was coined in reference to agricultural applications in that major crops like maize and tobacco were originally used basically for pharma applications. The concept of the "green biofactory" implies different advantages over the typical cell factories based on animal cell or microbial cultures already when considering the investment and managing costs of fermenters. Although yield, stability, and quality of the molecules may vary among different heterologous systems and plants are competitive on a case-to-case basis, still the "plant factory" attracts scientists and technologists for the challenging features of low production cost, product safety and easy scale up. Once engineered, a plant is among the cheapest and easiest eukaryotic system to be bred with simple know-how, using nutrients, water and light. Molecules that are currently being produced in plants vary from industrial and pharmaceutical proteins, including medical diagnostics proteins and vaccine antigens, to nutritional supplements such as vitamins, carbohydrates and biopolymers. Convergence among disciplines as distant as plant physiology and pharmacology and, more recently, as omic sciences, bioinformatics and nanotechnology, increases the options of research on the plant cell factory. "Farming for Pharming" biologics and small-molecule medicines is a challenging area of plant biotechnology that may break the limits of current standard production technologies. The recent success on Ebola fighting with plant-made antibodies put a spotlight on the enormous potential of next generation herbal medicines made especially in the name of the guiding principle of reduction of costs, hence reduction of disparities of health rights and as a tool to guarantee adequate health protection in developing countries.

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