

Welcome

Distinguished Colleagues and Participants, bonjour

Mid-March in Québec is a time of bright and crisp days where we, the inhabitants, begin to believe, once more, in green trees and scarf-free days. It is also mid-march for your co-hosts, the 20 plant-factory. As the Science Symposia will show, their long winter of technology development was very productive.



Geneart's rational gene design

Over the last decade, the Plant-made Pharmaceutical (PMPs) companies proved highly successful at expressing most human proteins in plants. Large-scale biomass production and downstream processing are efficient, and comply with regulations. Post-translational modifications can be mastered. The genome projects bring new capabilities. And so on.



Meristem's downstream processing suite

Of course, Winter is not over yet. The traditional Saint-Patrick's snowstorm could still hit us hard with up to 30 centimeters of snow (that is one foot for you, guests from the non-metric countries). But calm your fear, dear visitor: Lady Winter's potential danger was tamed by 400 years of management of snow-related risk. Speaking of fear of inclement weather, one could ask: Are plant-factories about to storm upon food-safety and the environment? A concern, rightly so. Fear, maybe. But no harm done, and a limited, manageable risk ahead.

First: PMPs are a very, very small affair, surface wise.

In 2002, PMPs covered a little more than 300 acres of highly monitored field trials - for measure, a football field fits into one acre, plus or minus a short pass. Add the industrial products, and you get a total of 715 acres of plant-factories in North America last year. Factor in the unavoidable duration of clinical trials, and you get a modest growth for the years to come.



greenovation's moss in bioreactor



Monsanto's corn field

Second: ten years from now, plant-factories' best-case scenario should be less than 0,01% of the agricultural soil in North America.

- Consider a development period of 5 to 10 years from the first field test permit to market entry.
- Calculate that, at market maturity, the average biologic drug will be grown on a surface smaller than one individual farm (< 1 000 acres).
- Be overly generous and assume that by 2013, each of the 20 PMP companies markets two approved and dominant products.
- Compute it all, and you get a modest land occupation of 40 thousand acres of PMPs in 2013 - this is the equivalent of 40 properly isolated farms growing alfalfa, corn, safflower, tobacco and other hosts.
- For measure, consider that in the USA alone, there was 937 millions acres of agricultural land in 1997, only 46% of it cropland (USDA), and ± 80 million acres planted with corn.

Third: by nature, scope and economics, the production of PMP is a high value-high maintenance activity that has little in common with food/feed/fiber agriculture.

The Business sessions will show how the cost structure of plant-factory companies includes sophisticated risk-management, identity preservation and quality control procedures, and that they can afford them. The Science Symposia and Platform Presentations will show several agricultural practices, genetic technologies, and control/audit procedures that maintain environmental and food-safety containment. The Stewardship/Regulatory sessions will present the strong set of rules that is, and will remain imposed on PMPs.



SemBioSys's safflower

Fear is a gift, a warning call. If it does not inhibit clarity nor action, fear keeps danger at bay by stimulating caution, prevention and control. The PMP companies already undertook preventative actions.

In addition to individual efforts, the plant-factory companies are working together since June 2001 to develop industry standards, and to consult with regulatory agencies and stakeholders. Last Summer, PMP companies committed to maintain their production under highly regulated regimes. And PMP companies have years of small-scale operations to implement and improve the appropriate procedures, under the strict supervision of regulatory agencies.

Rarely, if ever, a human innovation was shepherded with such intense, thorough and early attention.



Biolex's lemna growth chamber

Spring it is, then: plant-factories will bloom and bear their medicinal fruits. Which brings us to the perplexing question of money. Do you have enough to burn until harvest? And how will you generate a return on investment?

It could be contract manufacturing, product development alliances, becoming a FIPCO, growing through M&As; it could be public-funded research, VCs and merchant bankers, a return of the stock market. And what will Big Pharma do, and when?

The Business sessions will look at the financial cycle and business models of PMP companies, at times of scarce money.

At the end of the day, Plant-made Pharmaceuticals are all about Health. In each Platform Presentation, the PMP companies will depict their rich season of product development, and describe the health benefits they bring to the patients of the world.

Edible vaccines, oral administration and parenteral drugs, medical devices and blood proteins are coming, manufactured by plant-factories.



Medicago's alfalfa greenhouse

One day soon, someone you know will get an injection that treats Alzheimer's disease or swallow a red-tinted capsule that prevents cholera. This person might not be aware that the active ingredient was produced by a renewable, living plant-factory. But you will. You will because you are here, and because you will accomplish the scientific, business, regulatory and stewardship tasks that will make it happen. This day, dear colleague, will be a good day for all of us.



On behalf of the co-hosts of the Conference, generous sponsors and the organizing team, it is my honor to welcome you to the beautiful city of Québec at the last days of a long Winter. I wish you a fun, fruitful and enlightening Conference on Plant-made Pharmaceuticals.

We have important matters to attend to.



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