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AlgoLight, a photobioreactor platform for microalgae-based biopharmaceuticals

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Abstract

Microalgae are explored as a next-generation platform to produce biopharmaceuticals. Compared to current methods (mammalian cells, yeast, bacteria), plant-based techniques have the advantages of higher biosynthetic capacity, genetic engineering flexibility, absence of human pathogens, and finally lower cost. Photosynthetic microalgae have been proven at the lab scale to be a viable option for recombinant protein production, due to successful genes expression. On the way to commercialization, process development is now critical.

A process using genetically modified microorganisms must meet the regulatory legislation (UE Directive 2009/41/CE 6 May 2009). The production of microalgae in low-cost open systems can be easily contaminated and cannot avoid the spread of strains into the environment. A containment is possible in closed bioreactors, but the axenic character is not guaranteed, the control of the growth parameters is complex, the poor light distribution (either solar or artificial) is the limiting factor leading to low productivity.

AlgoLight (www.algolight.com), in cooperation with the University of Nantes, has developed a photobioreactor with internal volumetric illumination: PRIAM has a very high specific light area (up to 500 m-1), thus making it extremely productive and compact. The technology is based on a multilayer stack of double-sided light-emitting Lightex® plates, incorporating woven optical fibers fabrics fed by LEDs. The volumic productivity of a fermenter can now be reached in a photosynthetic process.

Opening a way to the cGMP-compliant production of plant-based therapeutic proteins in large-scale systems, our PRIAM photobioreactor is currently being scaled-up into a pre-industrial platform.

Biography:

Jean Francois JENCK has spent 35 years in the fine and petrochemical industries, from R&D to operations and investments. Formerly Technology Counselor of a multinational firm, he refocused to biotechnology and co-founded different start-ups (ENKI Innovation, AlgoSource, AlgoLight).

Speaker Publications:

1. “Products and processes for a sustainable chemical industry: a review of achievements and prospects”; Green Chem., 2004,6, 544-556.
2. “Production industrielle de microalgues et de cyanobactéries”; Industrial production of microalgae and cyanobacteria
3. “Palladium-catalysed direct amination of 2,3-dihydrofuran by morpholine”; J Chem Soc Chem Comm.
4. “ChemInform Abstract: Hydroformylation Catalyzed by Ruthenium Complexes”; Wiley, Volume24, Issue2
5. “IMPULSE – A New Approach to Process Design”; Wiley, Volume28, Issue4.

7th European Biopharma Congress; Webinar- April 27-28, 2020.

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