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Duckweed as a platform for the production of valuable pharmaceuticals

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Duckweeds, small floating aquatic plants of the family Lemnaceae, are widely distributed and grow rapidly in freshwater. Duckweeds can be grown in axenic culture on artificial media and under artificial as well as natural light. Their rapid growth, high protein and starch contents and lack of woody tissue make them ideal candidates for biotechnology applications. Agrobacterium-based genetic alteration and transient gene expression have been demonstrated in duckweed species, and bioengineered duckweed plants have been made to manufacture high-value recombinant biopharmaceutical compounds like interferon and monoclonal antibodies. One example was the technology developed at Biorex, a spinoff of research at NC State University. Biorex successfully developed a complete suite of technologies necessary to genetically engineer and manufacture a range of biopharmaceuticals in duckweeds for clinical use. Published information on the history of this company is used as a case study, and lessons from the Biorex failure are discussed.

Biography

Louis Landesman has 34 years of experience in aquaculture including raising aquarium fish and penaeid shrimp in SE Asia, sturgeon in California, redbfish in Mississippi, Chinese carp and tilapia in Israel, aquarium fish in Florida and catfish in Virginia. Also experience in project planning and implementation. International consultant, researcher, and lecturer specializing in aquaculture and fisheries. Successfully carried out aquaculture programs in Asia, Africa, Central America and the United States. Experienced in planning and implementing projects, keeping within tight budgets; research and data collection in many scenarios; cross-cultural communication and complexities. Conducted site surveys, planning, evaluation, research and development in fish, shrimp and aquatic plant production that contributed to expanding seafood and energy production both in the US and in Asia, Europe, Africa, Central America and the Caribbean.

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