



Spirulina | Photo source Pixabay

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GENETICALLY MODIFIED ALGAE FORMS BASIS FOR LOW-COST VACCINES

 HEALTH & WELLBEING

Researchers bioengineer algae to make high-value and affordable biologics products at commercial scale.

Spotted: Washington-based [Lumen Bioscience](#) is the first biotech company to produce a range of high-value oral biologics. Spirulina, a blue-green algae, covers antibody therapeutics and vaccines — both of which have been unmet needs in healthcare for a long time. Springwise has reported many algae-related innovations in the past. Examples include a wooden motorbike that runs on [algae oil](#), and a [‘living chandelier’](#) that absorbs carbon dioxide from the air and releases oxygen.

Having pioneered a natural blue pigment to replace those made from petroleum last year, Lumen is aiming higher. Now, it is seeking to harness the unique nutritional benefits of Spirulina in areas that have boggled traditional biotechnology platforms. ‘It’s hard to get plants or alginates to express protein at higher levels’, says Michael Tasch at Lumen, ‘but we’ve cracked the code’.

In November, Lumen was issued a broad US patent for its novel set of gene editing tools and methods. The patent will allow researchers to integrate stably engineered forms of Spirulina into global health approaches. This means faster timelines for drug development and lower costs. It also means increased availability of cures for the hundreds of millions afflicted with diseases each year.

Among other programs, Lumen received a grant from National Institutes of Health (NIH) to continue developing its low-cost, Spirulina-based oral malaria vaccine. Unlike injected vaccines, Lumen does not need refrigerated storage and distribution. In May, a grant was awarded by the US Department

of Agriculture (USDA) to manufacture oral vaccines that protected farmed fish from IHNV. IHNV is fatal to salmonid fish like trout and salmon and its impact has cost millions in lost sales.

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Takeaway:

The biologics industry has achieved significant commercial success in recent years. Similarly, a rising demand for personalised medicine holds promise for finding new ways to diagnose, prevent and treat disease. What is the scope of algae-based biologics in the near future?