Category: **Life Sciences & Earth Sciences**

**Enhancing Algae Production** Control of pests in algae cultivation systems with ammonia

**Problem Statement**

Advanced biofuels and bio-products from microalgae have considerable potential to help meet our sustainable transportation fuel goals, can facilitate greenhouse gas emission reductions, and enable production of value-added commodities from waste nutrients. Moreover, algae can be grown on marginal land using brackish water or wastewater, which reduces the food vs. fuel issues associated with first generation biofuel crops. Mass algal cultivation could even promote reforestation and carbon capture by displacing conventional animal feed crops.

Despite the many benefits of harnessing algae biomass for a variety of bio-products, there are still barriers that must be overcome to enhance the viability of such systems. Grazing pests (e.g. rotifers, ciliates and cladocerans) and pathogens (e.g. bacteria, viruses, and fungi) can cause mass algal cultures to crash, reducing annual productivity. Development of cost- effective methods for protecting algal crops against pests and pathogens is therefore vital for the successful scale up of the algae biomass industry.

**Technology Overview**

Cost-effective methods for protecting algae crops from grazing organisms like rotifers, which are capable of decimating algal crops, are needed to reduce the risk of pond crashes in mass algal cultures; this represents a key challenge for the successful commercialization of economical and sustainable biofuels and bioproducts. We developed a novel strategy to optimize the exposure time to free ammonia, via control of media pH, in defined media and wastewater to suppress rotifers while maintaining algal productivity.

**Applications:**

Companies involved in the large-scale production of algae for nutraceuticals, biofuels, and other bioproducts could benefit from this process, as it has the potential to stabilize production in the face of pests.

**Benefits:**

Our invention allows algal crops to be protected from grazers with no productivity loss, and at minimal operational cost, by elevating free ammonia at a duration and intensity necessary to significantly reduce grazer viability.



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Phase of Development

TRL:3-4

Working Prototype, etc.

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