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Class Standing: Senior

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Presentation Type: Poster presentation

Project Title: A rapid sampling technique for isolating lipid-rich algae strains from environmental samples

Synopsis: "Bio-prospecting" for useful algae strains requires rapid high throughput screening procedures in order to isolate novel species that are adapted to specific locations and applications. Here we describe a technique for sampling of strains.

Abstract: "Bio-prospecting" for useful strains requires rapid high throughput screening procedures in order to isolate novel species that are adapted to specific locations and applications. We are interested in native strains for bioremediation of animal wastes that could be synergistically coupled to feed and biodiesel production. Microalgae are more efficient for N and P bioremediation than higher plants, due to higher rates of biomass production and because algae lack the large stores of structural carbon characteristic of land plants. Thus, the C/N ratio of plants ranges from 18-120 while microalgae range from 5 to 20 indicating that water reclamation and nutrient recovery can be accomplished more rapidly using algae. The algae biomass can be used as a high protein and lipid feed supplement. Although several techniques for microalgae isolation have been described, traditional means of isolating algal strains is time consuming and excludes many dominant species, including diatoms and Microactium, leading to sampling bias favoring easily isolated strains such as Chlorella and Scenedesmus. To facilitate isolation of desirable strains for protein and oil production and rapid growth on organic wastes, we have developed a capillary aided sampling procedure which allows for the direct selection of diverse strains from heterogeneous populations. Here we have sampled high-rate algae ponds designed to treat dairy barn flush from 300 head organic dairy farm located at Cal Poly San Luis Obispo for algal strains with desirable protein and lipid profiles for feed.