

Solvent Extraction of Omega-3 Fatty Acids from Selected Microalgae Strains

Submitted to Synthetic Genomics, Inc.

and

A Major Qualifying Project Report

Submitted to the Faculty of

Worcester Polytechnic Institute

In partial fulfillment of the requirements

For the Degree of Bachelor of Science

By

Courtney A. Brock

August 22, 2011

Professor Robert Thompson

Faculty Advisor

Chemical Engineering

Abstract

Algae oils constitute promising and sustainable alternatives to fish oil for omega-3 fatty acids, and have applications ranging from foods and medicine to fuel and cosmetics. Among identified problems preventing a real take-off in algae oil production is the lack of efficient and mild extraction techniques that preserve the valuable fatty acids in the algal oil. For the Synthetic Genomics (SGI) Internship/ MQP project, a solvent extraction technique was tested, based on SGI analytical methods. The extraction efficiency of different solvents on varied microalgae strains was analyzed. Total lipid recovered by each solvent for each strain was determined. A fatty acid profile was characterized and an initial pond lay-out for one selected species was designed.