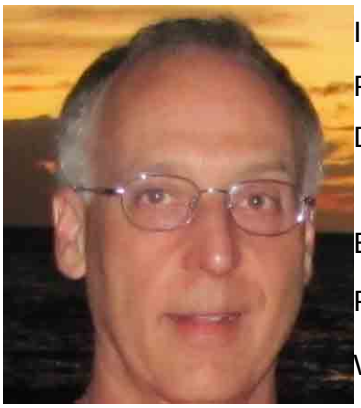

Investigator: Paul Blum
Position Title: Professor
Department: School of Biological Sciences
Email: pblum1@unl.edu
Phone: (402) 472-2769
Webpage: http://biosci.unl.edu/paul-h-blum

# *Co-Synthesis of Bioenergy Proteins to Increase Microbial Biofuel Competiveness*

**Abstract.**

Renewable fuels and chemical feedstocks will achieve sustainability only after they achieve large scale production. However, biorenewables are necessarily low value commodity products. Low valuation limits scale-up and the economics of production. To remedy this problem, we propose to add value to microbial-based energy systems by transitioning conventional cell lines into flexible production platforms that integrate the synthesis of protein coproducts. This project will target algal-biodiesel and yeast-cellulosic ethanol using two proteins; Resilin is an extremely efficient energy storage protein, and Sso1354 a hot acid resistant cellulase. Based on our prior track record of successful expression and purification for both proteins we will engineer high efficiency algal and yeast expression systems for scale-up production. The resulting protein coproducts will be used to develop energy efficient biomimetic materials (Resilin) and process improvement in bioethanol production (Sso1354) through the activities of participant research groups. Technoeconomic analysis will be used to model further increases in scale and thereby foster industrial partnerships for product applications.