



BIOINFORMATICS 2016 FALL SEMINAR SERIES

Hosted by: Department of Computer and Information Sciences,
Department of Electrical and Computer Engineering &
Center for Bioinformatics and Computational Biology
<http://bioinformatics.udel.edu/Seminars/Current>

MONDAY, November 7, 2016
3:30pm
DBI Room 102

Cryptic light-enhanced growth in heterotrophic bacteria

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ABSTRACT: Light powers both primary production and heterotrophy in diverse bacteria, which then grow faster in the light than in the dark. We have shown that Actinobacteria both with and without rhodopsins grow faster in blue light than in the dark – but the predicted light-capturing system in these organisms is incapable of converting light energy to chemical energy. We have also shown that sugar transport and metabolism are upregulated in the light, suggesting a coordinated transcriptional response to light that accounts for the faster growth. Here, light is used not as a source of energy. We hypothesize that light provides *information*, initiating a signaling cascade that upregulates carbohydrate metabolism, which in turn enhances growth and allows Actinobacteria to take advantage of the organic carbon synthesized by phototrophic neighbors in the light. A genome comparison of two species with the light-enhanced growth phenotype suggests that they have similar nutritional needs, and that they share a cryptochrome-like protein. A transcriptional analysis of these species' response to light and darkness is ongoing, which we will use to predict how Actinobacteria respond to light.