

Approach toward Biomass and Biofuel Production by Marine Microalgae in Tsukuba

Yoshihiro Shiraiwa^{1,2*}

¹Faculty of Life and Environmental Sciences, University of Tsukuba, Tsukuba, JAPAN

²CREST/JST, Tsukuba, JAPAN. E-mail: emilhux@biol.tsukuba.ac.jp

University of Tsukuba is one of the center for algal biomass and energy research in the world (1, 2). In 2011, a national project named as “Tsukuba International Strategic Zone” started and a theme on “Practical Use of Algal Biomass Energy” was selected one of six important researches need to be developed in Tsukuba (3). In this talk, I will introduce you which kinds of researches are proceeded in the University of Tsukuba. For example, the production of hydrocarbons as biofuels by a fresh and brackish water colonial green microalga *Botryococcus braunii* and as squalene by a heterotrophic microalga *Aurathiochytrium* and long chain-ketones by a marine unicellular haptophyte alga *Emiliana huxleyi*.

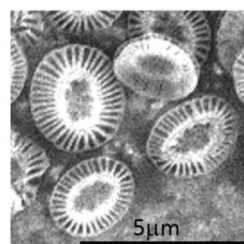
In addition to such biomass and energy production research, I will introduce you our most recent research topics on nano-crystal formation by the coccolithophores *Emiliana huxleyi* (haptophyte algae). We found that the cell covering coccolith disks made of calcium carbonate in *Emiliana huxleyi*, one of the promising biomass resources, potentially perform roles in reducing and enhancing the light that enters the cell by light scattering (4, 5). Elucidation of the physiological significance of coccolith formation in *E. huxleyi* will be talked in relation to the promotion of efficient bioenergy production using microalgae.



Emiliana huxleyi



Coccolithophore



Coccoliths

- (1) A tale of two cities: NatureJobs in Nature on 11 November, 2010. (http://ja.brc.riken.jp/inf/news/Nature_spotlight_on_tsukuba.pdf)
- (2) Spotlight on University of Tsukuba: NatureJobs in Nature (2014) doi:10.1038/nj0432 (<http://www.nature.com/naturejobs/science/articles/10.1038/nj0432>)
- (3) Tsukuba International Strategic Zone (<http://www.tsukuba-sogotokku.jp/en/>)
- (4) Mizukawa et al. Scientific Report (2015) 5, Article number: 13577 (2015) doi:10.1038/srep13577
- (5) Science News in Science Daily (<http://www.sciencedaily.com/releases/2015/09/150902091338.htm>)