Involvement of nano efflux pump in organic solvent- and vanillin-tolerance in *E. coli*

Noriyuki Doukyu[1, 2], Yuuki Ikehata[3]

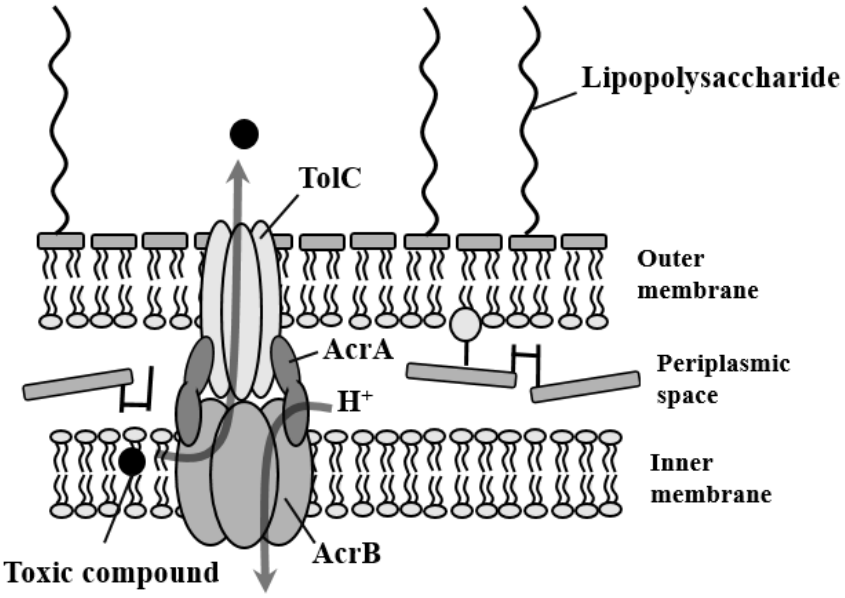
[1]Bio-Nano Electronic Research Center, Toyo University, 2100, Kujirai, Kawagoe, Saitama, 350-8585, Japan

[2]Department of Life Science, Toyo University, 1-1-1 Izumino, Itakura-machi, Gunma, 374-0193, Japan

[3]Graduate School of Life Sciences, Toyo University, 1-1-1 Izumino, Itakura-machi, Gunma, 374-0193, Japan

Microorganisms have evolved to cope with various environment containing toxic compounds such as antibiotics and endogenous metabolic products. Microorganisms possessing multidrug efflux systems are able to survive in adverse ecological niches. Energy-dependent efflux pumps belonging to the resistance/nodulation/cell division (RND) family have been shown to serve to maintain solvent tolerance in gram-negative bacteria. These efflux pumps consist of three components, a transporter protein located in the cytoplasmic membrane acting as an energy-dependent extrusion pump, a membrane fusion protein anchored to the cytoplasmic membrane, and an outer membrane protein. The AcrAB-TolC efflux pump, a member of the RND family, is a major pump exporting various hydrophobic compounds in *Escherichia coli*. Lignocellulosic biomass is a promising source for biofuel production. However, pretreatment of plant biomass for fermentable sugar production generates many kinds of byproducts including furfural and vanillin. Increase of tolerance to these byproducts often can enhance the production of biofuel.

In this study, we examined an involvement of AcrAB-TolC efflux pump in vanillin-tolerance.



AcrAB-TolC pump in *Escherichia coli*