

BCH 252 Seminar Series



**Dr. Robert P. Hausinger, Dept. of
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Seminar Title: "Biosynthesis and Function of
the Nickel-Pincer Nucleotide Cofactor"

Abstract: Lactate racemase interconverts the L- and D-isomers of lactic acid, a central metabolic intermediate in cells. In 2015, the Hausinger laboratory discovered that the enzyme responsible for this activity in *Lactobacillus plantarum*, LarA, possesses a covalently-tethered coenzyme they named the nickel-pincer nucleotide (NPN) cofactor. This novel organometallic molecule contains a square-planar nickel atom bound by one histidine residue and tri-coordinated by a modified pyridinium mononucleotide forming C-Ni and two S-Ni bonds. In this seminar, Dr. Hausinger will describe an array of structure/function studies that characterize the three enzymes used for biosynthesis of the NPN cofactor. LarB is a carboxylase/hydrolase of nicotinic acid adenine dinucleotide that forms a dicarboxylated pyridine mononucleotide (P2CMN). LarE is an ATP-dependent sacrificial sulfur insertase that converts P2CMN into a species with two thiocarboxylic acids (P2TMN). Finally, LarC is a CTP-dependent nickel insertase or cyclometallase that transforms P2TMN into NPN. The NPN cofactor is incorporated into a variety of 2-hydroxyacid racemases and selected sugar epimerases where it catalyzes proton-coupled hydride transfer reactions.

ZOOM Link:

<https://ucr.zoom.us/j/94186144189pwd=cjNWbURGYTB3TEJpODFSNVI6aDMxdz09>

**Tuesday, November 9th, 2021
12:00 p.m. - 12:50 p.m.**

Host: Dr. Jikui Song