

BIOSYNTHESIS OF AZASUGARS. Lorraine Clark and Nicole Horenstein. Department of Chemistry, University of Florida. Gainesville, FL 32611-7200.

We are investigating biosynthesis of the azasugar 1-deoxynojirimycin (DNJ) in the soil bacterium *Bacillus amyloliquefaciens*. Functioning as important medicinal compounds, DNJ and analogs have been used in folk medicine for centuries, and are applied in modern medicine for the treatment of diabetes and Gaucher's disease due to their inhibition of, and interaction with, glycosidases. Labeling studies in the early 1990s established glucose as a precursor of DNJ, but none of the intermediates or enzymes between glucose and DNJ were determined. We targeted the biosynthetic enzymes for DNJ using database mining and molecular cloning techniques. We have identified a cluster of three genes as part of the DNJ biosynthetic pathway, referred to as *gabT1*, *yktc1*, and *gutB1*. We present kinetic and spectroscopic data confirming abolition of DNJ production in a *gabT1* *B. amyloliquefaciens* knockout, and describe expression and characterization of this cluster of biosynthetic enzymes.