

Investigations into the Biosynthesis of a Thiazole/Oxazole-Modified Microcin from *Bacillus* sp. Al Hakam

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The recent explosion of genomic information has prompted a revitalized search for novel, bioactive natural products. Aided by genome mining, the thiazole/oxazole-modified microcins (TOMMs) are an example of a recently described family of natural products. These compounds bear characteristic cyclization and oxidation of thiol and alcohol containing amino acids to generate thiazoles and (methyl)oxazoles. Although many TOMMs have been identified, a number of challenges have prevented a thorough analysis of the enzymatic transformations. The properties of the TOMM from *Bacillus* sp. Al Hakam (Balh) allows us to overcome such challenges, and is the platform of choice for our investigations into the mechanism of the cyclodehydration. Using mechanistic insight from earlier studies, we hypothesize that cyclodehydration proceeds through a Vilsmeier-Haack type mechanism. To support this hypothesis, a multidisciplinary approach of physical organic, biochemical, and biophysical experiments are being conducted.

