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A. Matin: CHEMOLITHOTROPHY AND PHYSIOLOGY OF BACTERIAL NUTRIENT LIMITATION

An overview of the physiology of chemolithotrophic bacteria, particularly the thiobacilli, was presented. In these bacteria unique physiological traits are expressed during nutrient-limited growth. Different physiological types of chemolithotrophs, pathways of sulfur oxidation, and electron transport in the thiobacilli, problems encountered by chemolithotrophs in the generation of reducing power, and some explanations of the phenomenon of obligate chemolithotrophy were considered. Mixotrophy in the thiobacilli has been studied extensively both under nutrient excess and limitation. In nature, bacteria usually grow under nutrient limitation. Yet the bulk of our knowledge of microbial metabolic function is derived from bacteria grown in laboratory batch cultures containing a great abundance of nutrients. Microbial behavior in these two types of environments can be very different, indicating the need for basing an understanding of microbial ecology on studies that rely on cultivation of microorganisms under nutrient limitation. Nutrient-limited bacteria differ in several ways from those growing in large quantities of nutrients. They have different surface structures and make a much fuller use of their metabolic potential, especially by the synthesis of unique pathways of catabolic enzymes.

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