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DEVELOPMENT OF AN AUTOMATED SAMPLE EXTRACTION AND PREPARATION SYSTEM
FOR ASTROBIOLOGY IN SITU RESEARCH APPLICATIONS

Abstract

A prototype autonomous system was designed and constructed to evaluate the critical sample preparation functions that would be required for support of wet-chemistry based life detection instrumentation. The Limulus Amebocyte Lysate (LAL) assay, which detects lipids specific to gram-negative bacteria, has a simple extraction protocol and thus was selected as the model detection technique to be tested with this first-generation prototype. The LAL assay was also selected because there was already a compact, portable assay technology that was commercially available and could be easily integrated into the system. The design evolution, construction challenges, and testing of this sample preparation system will be presented in this article.