

## **Presyndromic Detection of Host Response Biomarkers in a Mouse Cowpox Model**

Michael S. Ascher, Richard G. Langlois, Kenneth W. Turteltaub, Kevin S. McLoughlin  
Lawrence Livermore National Laboratory, Livermore, CA

C. Rick Lyons  
University of New Mexico Health Sciences Center, Albuquerque, NM

### **Summary:**

Rapid diagnosis of infectious diseases in the “presyndromic” phase before frank symptoms are present is critical for reducing the morbidity and mortality from bio-terrorism events or newly emerging diseases. Host responses may provide early signals in blood biomarkers even from localized infections. Multiple biochemical markers may be required to obtain disease-specific detection. We looked for such early changes in the course of cowpox infection in mice using a broadly-multiplexed assay panel of serum proteins.

Immunoassays have the ability to quantify small changes in concentration, and can be completed in two hours. Host response changes in multiple biomarkers are detectable in serum from a localized lung infection 1-2 days prior to overt signs of illness. The pattern of response or signature varies among markers presenting the possibility of using the pattern of biomarkers to determine the stage of infection. This animal model is suitable for whole genome expression studies and the assay system appropriate for assessing other infections.