

The panel expressed specific interest in research on immunogenetics, immunologic memory, priming, the role of cell-mediated immunity, immune correlates of protection, antigenic competition, and the cytolytic response in vaccine efficacy.

*The need for a better understanding of antigen presentation, adjuvant effects, and immunopotential.* The distinction of adjuvants and immunopotential from presentation systems as separate entities was emphasized by the panel. Additional work on novel antigen presentation systems is needed. Vaccine vectors offer the potential for delivery of multiple antigens and thus are being explored for both veterinary as well as human vaccines. The 1993 annual Jordan Report describes recent progress in this field. The panel suggested that recent advances in the development of vectored vaccines for veterinary use, such as rinderpest, must be considered in the further development of experimental vaccines using vectors, based on BCG or *Salmonella typhi* or canarypox, for use in humans.

4. *The need for the development and support of animal models for target diseases, both for investigation of pathogenesis and evaluation of vaccine and therapeutic candidates.* New opportunities, such as transgenic animals as models for the human immune system, highlight the importance of facilities for both small animals and primates. The need to support research on appropriate animal model systems was recognized and discussed at length by the panel. Research for some diseases, such as multiple drug-resistant tuberculosis, requires high containment animal facilities. Other groups have suggested that regional centers might be the best solution to this problem. The panel considered regional centers to be the least favorable option because the specific needs of investigators could not be dealt with on a regional basis. They favored the systematic strengthening of animal research resources at the local level. The panel suggested, for example, that expanding the capability to study primate model systems be considered and encouraged the Institute to give that proposal high priority. The panel also recognized that many of the model systems being used, such as transgenic mice that carry the poliovirus receptor for the study of neurovirulence, are costly. Changes in the national standards for animal care also are increasing costs, but the panel strongly endorsed proposals for using animal model systems in support of the vaccine research agenda outlined in the plan.