

## Research Areas of Special Emphasis

Within the wide spectrum of research supported by the NIEHS, the research areas listed below have been identified by the National Advisory Environmental Health Sciences Council as topics of special interest to forwarding the research programs of the institute. The complete list and descriptions of these topics can be found on the DERT Web page at <http://www.niehs.nih.gov/dert/programs/special/special.htm>.

**Environmental Genome Project:** Research in this area addresses the range of variability among individuals in a population with respect to disease risk associated with environmental exposures, which may be attributed in some part to variability in genetic parameters and host characteristics that have been found at the molecular level. New statistical and informatics paradigms are needed to handle and interpret the large amount of data expected to be generated.

**Basic Molecular Mechanisms of Environmental Insult:** The NIEHS conducts research on the molecular and cellular mechanisms involved in the biological response to toxic agents and the development of specific therapies based on these mechanisms for a variety of environmentally associated diseases.

**Reproductive Health:** The NIEHS studies environmental agents such as endocrine-disrupting chemicals that affect the reproductive status of humans, particularly the health of both male and female reproductive systems. Priority areas for research include changes in fertility, increased risk of prostate and breast cancer, and increased risk of male and female genitourinary birth defects (including hypospadias, cryptorchidism, and ovarian or uterotubal dysgenesis).

**Immune System Modulation:** Environmental insults can lead to activation or suppression of the immune system, resulting in autoimmune diseases or infections, respectively. Likewise, the immune status of the individual may influence the individual's response to the environmental exposure. Expanded programs in basic, clinical, and epidemiologic research are anticipated to explore these links.

**Neurodegenerative/Neurobehavioral Diseases and Disorders:** Research and research training are needed in all areas of neurodegenerative/neurobehavioral disease for which there are environmental factor inputs into the disease causation, progression, or outcomes. This includes approaches that are mechanistic, behavioral, or epidemiologic in nature as well as those aimed at developing biomarkers of preclinical disease or models of the clinical disease.

**Diet and Nutrition:** Nutritional status is likely to interact significantly with environmental exposures to either exacerbate the adverse effects of the toxicant or to serve a protective function. The molecular mechanisms responsible for these interactions are likely to be important in the modulation of environmental effects in both developmental disorders and human diseases. In addition, the NIEHS has a special interest in interactions between environmental exposures and the beneficial or detrimental effects of botanical (herbal) and nutraceutical dietary supplements.