FY 2004 NIH Research Priorities for Women's Health

The mission of Office of Research on Women's Health (ORWH) is to stimulate and encourage meritorious research on women's health, including sex and gender factors in health and disease. ORWH collaborates with the scientific, health professional and advocacy communities to implement the recommendations from the report, *Agenda for Research on Women's Health for the 21st Century (Agenda)*.

Each year, the ORWH considers the continuing gaps in knowledge from the *Agenda* or newly emerging scientific concepts to determine specific areas of research priorities for new initiatives or increased focus. The *ad hoc* Subcommittee of the *Coordinating Committee on Research on Women's Health* (CCRWH), composed of representatives from the NIH institutes and centers, reviewed the many areas of research opportunities and recommended to the ORWH those determined to be of special importance for expanding current initiatives or for developing new research programs. The entire CCRWH and the members of the *NIH Advisory Committee on Research on Women's Health* further reviewed these recommendations that are utilized by the ORWH to determine priority research areas for FY 2004.

In the development of the FY 2004 ORWH research priorities, many areas of research opportunities have been described in terms of overarching approaches. Those recommended here signify approaches and areas in which the ORWH wishes to stimulate and encourage research on women's health. Of particular interest are basic, translational, behavioral and clinical research in women's health, especially to determine sex/gender differences or other variables. These research priorities are not an exclusive list of research areas important to women's health, and new studies in FY 2004 should not be limited to the areas listed here. For FY 2004, the following overarching approaches have been recommended:

I. OVERARCHING THEMES FOR RESEARCH ON WOMEN'S HEALTH

The following four are overarching themes important for addressing research on women's health.

Sex/Gender Determinants Women are characterized by both sex and gender as highlighted in the *ORWH Agenda for Research in Women's Health for the 21st Century* and the Institute of Medicine report, entitled *Exploring the Biological Contributions to Human Health: Does Sex Matter*? Sex factors that contribute to the biological differences include chromosomes, reproduction, and hormones. The effects of gender on psychological, social, and behavioral perspectives are important considerations in most areas of research. Consideration of these variables is critical to the accurate interpretation and validation of research affecting women's health. Moreover, these variables determine how similar or different health or disease processes may be between women and men.

Lifespan The health of girls and women is affected by developmental, physiological, and psychological age. Women's lives are marked by continuum from intrauterine life to the elderly years: infancy, childhood and adolescence, menarche, reproductive life, the menopausal transition, postmenopausal years, the elderly and frail elderly. Many women's lives and health status are influenced by factors such as work inside and outside the home, care-giving roles such as childcare and elder care responsibilities, reproductive influences, and chronic illness. Each of these may influence health, disease, treatment choices, and response to therapy. Researchers should consider these variables in designing studies related to women's health.

Health Disparities/Differences and Diversity Women are disproportionately affected by some conditions and diseases in terms of incidence, diagnosis, course, and response to treatment. Some populations of women may be at higher risk for adverse disease outcomes because of factors such as: culture, education, access to care, quality of care, and opportunities for inclusion as research subjects in clinical trials and studies. Thus, clinical research should include, but not be limited to, population-specific characteristics such as cultural diversity, racial and ethnic minorities, immigrant status, rural or inner city residency status, effects of poverty or low socioeconomic status, sexual orientation, and physical or mental disabilities.

Interdisciplinary Research With increasing understanding of the inter-relatedness and complexity of disease, the nature of scientific investigation is shifting to a multi-disciplinary collaborative approach. Advances in women's health can be better achieved by promoting partnerships in cross-disciplinary research from basic to clinical and translational research that involves collaborative interactions with researchers in all areas of academic, private industry, and federal settings, and provides access to the latest scientific tools and technologies.

Research from many perspectives is needed in women's health, including integration of knowledge from disparate sources as well as teams with multiple areas of scientific expertise. Interdisciplinary research can facilitate the integration of basic science, clinical research and translational research, population studies, behavioral and social research, and outcomes research. An additional focus on bioengineering and biomedical informatics, genomics, proteonomics, imaging, industry, and metabolomics is increasingly relevant to research on women's health.

II. AREAS OF INTEREST IN WOMEN'S HEALTH FOR FY 2004

Within the research continuum, studies that encourage the adoption of basic, clinical and translational research findings should emphasize important questions that still remain about women's health. This would include fostering more research to identify the best methods to move knowledge gained from basic science research into clinical research and practice in order to improve clinical outcomes. Studies that help to determine the best clinical practices in the care of women, or of men, should be emphasized in order to increase the clinical knowledge base, and the ability of women to participate in the management of their health.

In addition, studies that enhance the adoption of clinical research results by healthcare providers and public policy makers are further steps in advancing women's health research. The value of conveying clinical observations to basic scientists is important. Through a continuum of interdisciplinary collaborations, research can better contribute to the development and evaluation of effective strategies to improve the health-related quality of care and quality of life for women.

Basic, clinical and translational research should be considered in addressing priority areas in women's health research. Some examples may include, but are not limited to:

- Studies of chromosomal, genetic, gonadal and phenotypic sex in *in vitro* or animal models
- Etiologic mechanisms to elucidate sex differences in cellular, tissue/organ, physiological and/or immune responses to environmental and infectious agents
- Cellular and molecular studies of the mechanism of action and affects of complementary and alternative medicines and dietary supplements in the treatment of conditions or diseases that differentially affect women

- Studies of the pathogenesis of diseases that differentially affect women, including those affecting behavioral pathways and the endocrine, musculoskeletal, autoimmune, urologic, cardiovascular, ophthalmic, and neurobiological systems
- Systemic and cellular modeling of biological pathways and systems related to women's health
- Clinical trial methodology, including ethical issues and study design specific to women, novel recruitment strategies, and novel statistical analysis methodology
- Mental health studies, including physical and physiological stressors, incidence and severity of addictive, mood, cognitive, and anxiety disorders, behavioral studies on the effects of care-giving on the health of the care-giver and multiple/competing societal role.
- Studies on new agents for management of menopausal symptoms
- Prevalence and validation of sex differences in the diagnosis and treatment of disorders and diseases differentially affecting men and women
- Treatments and other interventions for specific diseases that have enhanced clinical presentation in women including, but not limited to diseases of the metabolic, endocrine, autoimmune, urologic, ophthalmic, oral, reproductive, musculoskeletal, neurological and cardiovascular systems
- Special trans-NIH research collaborations in areas such as Chronic fatigue Syndrome and uterine fibroids

III. SPECIAL EMPHASIS AREAS FOR FY 2004

For FY 2004, the ORWH is especially interested in fostering research in women's health in the high priority areas of prevention, and genetics/pharmacogenomics.

Prevention and Treatment

Increased knowledge of how to prevent conditions and diseases, or to better treat them can result in significant improvements in the quality and length of women's lives. Prevention research spans the continuum from the most basic biological studies to understanding the basis and effects of risk behaviors across the lifespan, and the interventions to change them. Examples of needed prevention research studies in women's health include, but are not limited to:

- Research to identify and validate biomarkers of disease pathogenesis and risk and their applications to disease prevention, early detection and treatment, including the development of novel tools
- Studies of the impact of diet, nutrition, hormones, exercise, weight patterns, tobacco, alcohol and drug abuse, and violence on health
- Research on reproduction, from menarche, including pregnancy to the menopausal transition, with regard to the susceptibility to, and protection from, diseases and conditions
- Studies of the factors which are involved in disease initiation and progression in order to develop effective preventive and curative strategies
- Development, testing, and validation of preventive and curative strategies for conditions and diseases, including but not limited to: sexually transmitted diseases, cancer, coronary artery disease, stroke, obesity, musculoskeletal disorders, addictions, and chronic multi-system diseases

- Studies of the effect of biological, behavioral, cultural, social, economic, and environmental factors on susceptibility to, or protection from, disease

Genetics/Pharmacogenomics

The sequencing of the human genome has provided a resource for research on disease incidence, pathogenesis, and response to treatments. The role of genetic polymorphisms and pharmacogenomics holds promise as exhibited by recent successes for predicting response of individuals to a range of current treatments. Emphasis in this emerging area is needed on women and the diseases that disproportionately affect them, as well as, if and why, there may be sex differences. For example:

- Particular emphasis on sex chromosomal differences; genomic areas known to be involved in diseases that disproportionately affect women; the effects of aging (or different ages) on gene expression; and the relationship of these findings to genetic polymorphisms
- Genetic, molecular and cellular bases for action of pharmacologic agents known to have different effects in women. Examples include the scientific basis for drugs, environmental exposures, devices, and biologics targeted at a particular sex for common diseases; impact of lifespan, developmental phase, and pregnancy in pharmacokinetics, pharmacodynamics, drug efficacy and adverse effects; development of novel methods of analysis; and the application of pharmacogenomics to clinical care
- Emphasis on critical windows of susceptibility; the interaction of genetic polymorphisms with diet, drugs, or toxins on the architecture or development of reproductive or other organs; genetic, cellular, and molecular mechanisms of environmental exposures occurring prenatally, during puberty or pregnancy and beyond