



Scientists Form International Cancer Genome Consortium

Research organizations from around the world announced they are launching the International Cancer Genome Consortium (ICGC), a collaboration designed to generate high-quality genomic data on up to 50 types of cancer through efforts projected to take up to a decade.

The ICGC will make its data rapidly and freely available to the global research community. It invites research organizations in all nations to participate.

"Cancer's complexity poses an enormous challenge. NIH is highly encouraged that the worldwide scientific community is joining to meet this challenge, and we are pleased to be a member of this ambitious international endeavor," said Elias A. Zerhouni, M.D., director of the National Institutes of Health, which is the U.S. research organization taking part in the ICGC. "The consortium's commitment to making its data rapidly available in public databases will serve to accelerate research into the causes and control of cancer in the United States and throughout the world."

Each ICGC member intends to conduct a comprehensive, high-resolution analysis of the full range of genomic changes in at least one specific type or subtype of cancer, with studies built around common standards of data collection and analysis. Each project is expected to involve specimens from approximately 500 patients and have an estimated cost of \$20 million.

As part of its coordination efforts, the ICGC will generate a list of approximately 50 cancer types and subtypes that are of clinical significance around the globe. ICGC members plan to assume responsibility for specific cancers, and one of the ICGC's roles should be to facilitate the exchange of information so participants' efforts do not duplicate each other.

Current ICGC members include:

Australia: National Health and Medical Research Council (Observer Status)

Canada: Genome Canada; Ontario Institute for Cancer Research

China: Chinese Cancer Genome Consortium

Europe: European Commission (Observer Status)

France: Institut National du Cancer

India: Department of Biotechnology, Ministry of Science & Technology

Japan: RIKEN; National Cancer Center

Singapore: Genome Institute of Singapore

United Kingdom: The Wellcome Trust; Wellcome Trust Sanger Institute

United States: NIH

"Clearly, there is an urgent need to reduce cancer's terrible toll. To help meet that need, the consortium will use new genome analysis technologies to produce comprehensive catalogs of the genetic mutations involved in the world's major types of cancer," said Thomas Hudson, M.D., of the ICGC Secretariat, which is based at the Ontario Institute for Cancer Research in Toronto. "Such catalogs will be valuable resources for all researchers working to develop new and better ways of diagnosing, treating and preventing cancer."

Worldwide, more than 7.5 million people died of cancer and more than 12 million new cases of cancer were diagnosed in 2007. Unless progress is made in understanding and controlling



cancer, those numbers are expected to rise to 17.5 million deaths and 27 million new cases in 2050.

Once thought of as a single disease, cancer is now understood to consist of a large number of different conditions. In almost all forms, however, cancer changes the genetic blueprint, or genomes, of cells, and causes disruptions within normal biological pathways, leading to uncontrolled cell growth. Because genomic changes are often specific to a particular type or stage of cancer, systematically mapping the changes that occur in each cancer could provide the foundation for research to identify new therapies, diagnostics and preventive strategies.

The ICGC's main criteria for prioritizing cancer types include: impact, including incidence and mortality rates, availability of therapies and age of onset; scientific interest; and feasibility, which includes the ability to obtain enough high-quality samples to conduct a large-scale project.

To facilitate comparisons among different types of cancer, the ICGC guidelines list key factors for its members to consider in the production of genomic catalogs. Those factors include comprehensiveness, which involves detecting all cancer-related genetic mutations that occur in at least 3 percent of tumor samples; resolution, which involves generating data at the level of individual DNA bases; quality, which involves monitoring based on common standards for pathology and technology; and controls, which involves comparisons of data from matched, non-tumor tissue.

ICGC member nations plan to agree to common standards for informed consent and ethical oversight. While the informed consent process will necessarily differ according to each member country's requirements, the consortium's policies state that cancer patients enrolled in an ICGC-related study should be informed that their participation is voluntary, that their clinical care will not be affected by their participation and that data obtained from analyses using their samples will be made available to the international research community. ICGC members also should take steps to ensure that all samples will be coded and stored in ways that protect the identities of the participants in the study.

To maximize the public benefit from ICGC member research, data will be made rapidly available to qualified investigators. In addition, all consortium participants intend not to file any patent applications or make other intellectual property claims on primary data from ICGC projects. The ICGC is open to all entities that accept its policies and guidelines. A white paper detailing those policies and guidelines is available on the consortium's Web site at www.icgc.org.