National Cancer Institute

Office of Cancer Genomics

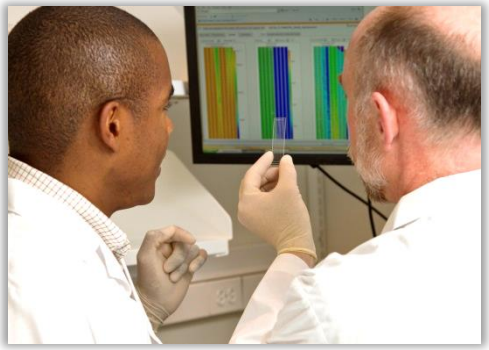
OCG MISSION

The National Cancer Institute's **Office of Cancer Genomics** (OCG) aims to advance the molecular understanding of cancers with the ultimate goal of improving clinical outcomes. OCG's research programs conduct systematic characterization of tumor genomes and work rapidly towards translating the resulting molecular insights into improved cancer management and treatment strategies.

Learn about OCG and sign up for OCG mailing list: *https://ocg.cancer.gov*

OCG PROGRAMS

OCG supports large-scale cancer genomics research programs. The data generated by these programs are disseminated to the research community via a program-specific Data Matrix or Portal. OCG initiatives promote advances in technology-based infrastructure and create valuable experimental reagents and tools for program researchers and the research community. Through collaborations with other genomic cancer projects, OCG initiatives accelerate the translation of findings into the clinic. Current programs are described below and program data-access information is on the backside of this flyer.



TARGET Therapeutically Applicable Research to Generate Effective Treatments

TARGET is a comprehensive molecular characterization initiative that utilizes state-of-the-art genomics tools to identify molecular changes that drive childhood cancers: acute lymphoblastic and myeloid leukemias, neuroblastoma, osteosarcoma, and several types of kidney tumors. Emphasis is placed on finding alterations that can be targeted with therapeutic agents and/or informing improved treatment strategies. TARGET is organized into a collaborative consortium of disease-specific project teams that leverage the strengths and resources of various NCI programs to fulfill its mission. This cooperative approach promotes efficient discovery and translation of scientific insights into more effective, less toxic treatment regimens. *https://ocg.cancer.gov/programs/target*

CTD² Cancer Target Discovery and Development Network

The goal of the CTD² Network is to develop and apply new scientific approaches to accelerate the translation of genomic discoveries into novel treatments. To accomplish this, the CTD² Network emphasizes interactions between laboratories with complementary and unique technical expertise in areas such as bioinformatics, genome-wide functional *in vitro* and *ex vivo* screening, protein-protein interactions, and small molecule high-throughput screening. This approach allows the CTD² network to discover functional interactions within the context of specific tumor types to identify new precision medicine approaches. *https://ocg.cancer.gov/programs/ctd2*

NEW The CTD² Network has developed the CTD² Dashboard, a web interface which hosts analyzed data and other evidence generated by the Network Centers. Visit the CTD² Dashboard: *http://ctd2-dashboard.nci.nih.gov*

CGCI Cancer Genome Characterization Initiative

CGCI supports research to comprehensively catalog the genomic alterations in adult and pediatric cancers. Two completed projects examined genetic alterations in medulloblastoma and non-Hodgkin lymphoma.

CGCI consists of two ongoing projects: HIV+ Tumor Molecular Characterization Project (HTMCP) and Burkitt Lymphoma Genome Sequencing Project (BLGSP). HTMCP is using genomic and transcriptomic sequencing to uncover distinct features of HIV-associated cancers, including diffuse large B-cell lymphomas, lung carcinomas, and cervical carcinomas. BLGSP aims to identify genetic changes in patients with sporadic, endemic, and HIV-associated Burkitt lymphoma. CGCI provides the cancer research community with high-quality genomic data to gain insight into the underlying mechanisms of these cancers. *https://ocg.cancer.gov/programs/cgci*

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

OFFICE of CANCER GENOMICS

NEW PROGRAM

Cancer Models

OCG is managing a one-year pilot to develop and characterize patient-derived *in vitro* novel cancer models, including "organoid" cultures and conditionally reprogrammed cells. The tumor types included in the pilot are breast, bladder, colon, lung, pancreas, and prostate. Molecular characterization and clinical data will be obtained for the primary tumors and models.

RESOURCES FOR THE RESEARCH COMMUNITY

Several OCG initiatives provide valuable resources for researchers.

Standard Operating Procedures (SOPs) for BLGSP and HTMCP

The SOPs for BLGSP and HTMCP provide detailed protocols for contributing samples and data to these large-scale genomic characterization projects. In addition, these manuals contain general protocols and templates that can be applied to other genome characterization initiatives.
https://ocg.cancer.gov/programs/cgci/resources

Cancer Genome Anatomy Project (CGAP)

CGAP is a user-friendly online resource of biological tissue characterization data, including gene expression profiles of normal, precancerous, and cancerous cells, along with tools for analyzing these data. CGAP also provides a single nucleotide polymorphism analysis of cancer-related genes and the Mitelman database of chromosomal aberrations in cancer. For a virtual tour of the CGAP website, contact OCG for a free CD.
http://cgap.nci.nih.gov/cgap.html

Cancer Genetic Markers of Susceptibility (CGEMS)

CGEMS uses collaborative genome-wide association studies (GWAS) to identify common genetic variants that affect individual risk of developing cancer. *http://dceg.cancer.gov/research/how-we-study/genomic-studies/cgems-summary/*

The ORFeome Collaboration (OC)

The OC provides the research community with a library of validated, expression-ready, full length open reading frames for most of the currently defined human genes.
http://orfeomecollaboration.com/

Mammalian Gene Collection (MGC)

The MGC created an open-access bank of "expression-ready" full-length open reading frame clones for the majority of protein-coding human and mouse genes, as well as some cow, rat, xenopus and zebrafish genes. *http://mgc.nci.nih.gov/*

ACCESSING OCG DATA

All data generated by OCG initiatives are shared with the research community through its website. The program-specific Data Matrices or Data Portal are maintained by the Data Coordinating Center at the NCI Center for Bioinformatics and Information Technology, which manages and stores the data generated for OCG.

Accessing CTD² Data

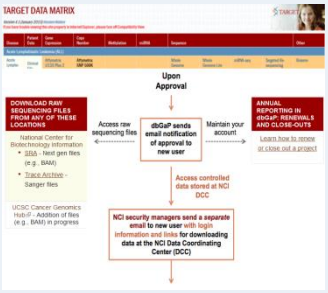
Raw primary data are deposited in the CTD² Data Portal and analyzed data are deposited in the CTD² Dashboard. All data generated by this initiative are open access.

CTD² Data Portal: *https://ctd2.nci.nih.gov*
CTD² Dashboard: *http://ctd2-dashboard.nci.nih.gov*

Accessing TARGET and CGCI Data

Genomic profiles for a variety of tumor types (including clinical, molecular characterization, and processed sequence data) are easily accessible through a user-friendly Data Matrix specific to each program. Researchers can access up to four levels of data (from raw/trace files through cumulative data) for the molecular platform employed. To protect the privacy of the patients, some clinical and genetic data require approval to access through NCBI's database for Genotypes and Phenotypes (dbGAP; *http://www.ncbi.nlm.nih.gov/gap*).

For a visual and interactive guide to accessing open or controlled access TARGET data, visit the flowchart: *https://ocg.cancer.gov/flowchart/guide-accessing-target-data*



TARGET Data Matrix:
http://target.nci.nih.gov
CGCI Data Matrix:
http://cgci.nih.gov

OCG e-News

Everyone is invited to check out the OCG e-News, an online newsletter featuring research spotlights, educational articles, guest editorials by OCG scientists, and more!
https://ocg.cancer.gov/news-publications/e-newsletters

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