



RESEARCH RESOURCES

AT THE FREDERICK NATIONAL LABORATORY

The Frederick National Laboratory is meeting the nation's most urgent biomedical research needs and serves as a national and global resource for the scientific community.

Most resources listed below are available for cancer researchers freely or at nominal costs.

Biological Repositories

Patient-Derived Models Repository

- Patient-derived xenografts, in vitro patient-derived tumor cell cultures, cancer associated fibroblasts, & patient-derived organoids

NCI Mouse Repository

- 150 genetically engineered cancer models
- 1,500 genetically engineered mouse embryonic stem cell lines harboring conditional microRNA transgenes

NCI Natural Products Repository

- 80,000 plant samples
- 20,000 marine invertebrates and marine algae samples
- 16,000 microbes samples

NCI Program for Natural Product Discovery Prefractionated Library

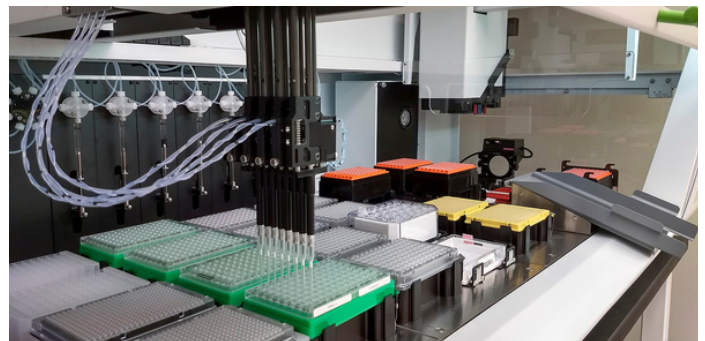
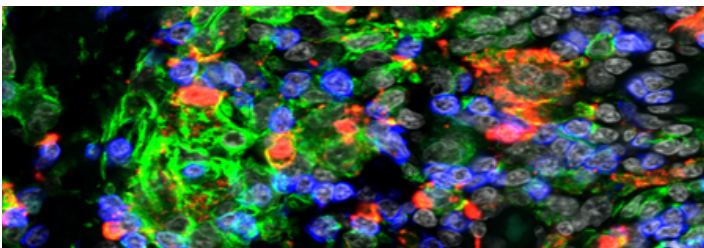
- 500,000 natural product fractions

Tumor Repository

- In vitro cell lines, transplantable animal and human tumors, canine specimens, and yeast

Biological Resources Branch (BRB) Preclinical Repository

- Cytokines, monoclonal antibodies, and other biologic reagents



Reference Materials and Operating Procedures

Human SARS-CoV-2 Serology Standard

- Human SARS-CoV-2 evaluation panel and serology standard (calibrated to the WHO International Standard)

HPV Serology Reference Standard

- HPV serology reference standard, proficiency panel, and an array of HPV operating procedures

Good Manufacturing Practices (GMP) Training and Standard Operating Procedures

- GMP documents covering cell therapy, development operations, quality control, production, regulatory affairs, and more

Scientific Standards Hub

- Standards and references to increase the reproducibility of data in the areas of AI and data science, antibody science, biospecimen assays, electron microscopy, nanotechnology, protein science, and serology

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Data Repositories and Computational Tools

Cancer Research Data Commons

- Cloud-based data infrastructure that connects data sets with analytics tools to allow users to share, integrate, analyze, and visualize cancer research data to drive scientific discovery:
 - **Genomic Data Commons**
 - **Proteomic Data Commons**
 - **Integrated Canine Data Commons**
 - **Imaging Data Commons**
 - **Cancer Data Service**
 - **NCI Cloud Resources**

Clinical Trials Reporting Program

- Comprehensive database on all interventional NCI-funded clinical trials

Biological DataBase Network

- Network of the major biological databases, including Gene, UniProt, Ensembl, GO, Affy, and RefSeq

Annotation, Visualization, and Impact Analysis

- Application that guides, prioritizes, and summarizes genomic variants

NCI-Department of Energy (DOE) Collaboration AI/ML Resource

- Cutting-edge computational models, algorithms, data sets, software, and other resources, including the following:
 - **Predictive Oncology Model and Data Clearinghouse (MoDaC)** – public-facing repository to enable sharing of NCI-DOE Collaboration data sets
 - **CANcer Distributed Learning Environment (CANDLE)** – software that improves machine/deep learning models by performing hyperparameter optimization
 - **ATOM Modeling PipeLine (AMPL)** – open source, modular, extensible software pipeline for building and sharing models to advance in silico drug discovery
 - **Innovative Methodologies and New Data for Predictive Oncology Model Evaluation (IMPROVE)** – AI and machine learning (ML) resources for comparing and evaluating deep learning drug response prediction models
 - **AI-Driven Multiscale Investigation of the RAS/RAF Activation Lifecycle (ADMIRRAL)** – AI/ML resources supporting the development of predictive molecular-scale understanding of RAS-RAF activation
 - **Modeling Outcomes Using Surveillance Data and Scalable AI for Cancer (MOSSAIC)** – AI/ML resources NCI's Surveillance, Epidemiology, and End Results (SEER)

Services

Cancer Nanomedicine Characterization Program

- Characterization of oncology nanoparticles' physical and chemical attributes, their in vitro biological properties, and their in vivo compatibility using animal models

Technical Service Program

- At-cost access to unique HIV/AIDS, nanomedicine, and laboratory animal services

National Cryo-Electron Microscopy Facility

- High-resolution cryo-EM imaging services

Antibody Development

- Affinity reagent production and characterization for cancer-related targets

Antibody Portal

- Standardized renewable affinity reagents to cancer-associated targets and accompanying characterization data
- 943 monoclonal antibodies to 547 antigen targets

Imaging Mass Cytometry Laboratory

- High-dimensional proteomics analysis of tumor samples

NCI Experimental Therapeutics Program (NEXT)

- Resources for projects focused on developing therapies for unmet medical needs in oncology

RAS Tools and Resources

- Unique reagents, assays, and tools to support RAS research

