

NCI Clinical Trials Network (NCTN) Biospecimen Banks

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NCTN Biospecimen Banks

- Banks are an integral part of the NCTN (supported by U24 grants)
- Unique resource: collect, store and provide researchers with well-annotated specimens and clinical data from NCTN phase III and large phase II trials (adult and children with solid tumors and hematological malignancies)
- NCI Cooperative Group Banking RFA (Cancer Diagnosis Program):
 - U24 Cooperative Agreement Grants/Supplements (9/2005-3/31/2015)
 - Supplements for common IT Navigator development (2012-present)
- New RFA-CA-14-501 (2015-2020) supports a harmonized NCTN banking network (5 Biospecimen Banks) for reorganized 4 Adult and 1 Pediatric NCTN Groups:
ALLIANCE, NRG, ECOG-ACRIN, SWOG, COG

NCTN Biospecimens

- Biospecimens are associated with detailed clinical data related to therapy, therapeutic response, and clinical outcome.
- Biospecimens are collected by NCTN Groups and affiliated institutions, including National Community Oncology Research Program (NCORP) using special collection kits and SOPs provided by the banks.
- Biospecimens are sent to the NCTN Bank of the Group conducting the trial (lead NCTN Group).
- Participants may consent to the use of their biospecimens for additional studies beyond specific trial objectives.

NCTN Biospecimens

- Biospecimens are collected on NCTN protocols (U10 grants) and used for integral and integrated biomarker studies/assays (prognosis/prediction).
- Biospecimens that remain in excess after clinical trial requirements have been met become “**legacy**” specimens and are distributed to investigators following a defined NCTN access process and approval of the study by expert review.
- Use of NCTN Biospecimens:
 - Higher priority: Validation studies of predictive/prognostic biomarkers
 - Lower priority: Assay development/validation

NCTN Biospecimen Banks

- Each NCTN Group is associated with a biospecimen bank.
- Types of biospecimens include:

Frozen tissue	FFPE tissue	Tumor tissue
Non-malign. tissue	Peripheral blood	Bone marrow
Serum / Plasma	Urine	Other biofluids
RNA and DNA	Tissue microarrays	
- Biospecimen organ sites and types are trial dependent.

Scientific Impact (2008-2013)

- High-dose daunorubicin selectively benefits AML patients with mutations in DNMT3A, NPM1 or MLL translocations (Patel JP, *et al.*, *NEJM*; 2012)
- *OncotypeDx*TM test improved risk stratification in stage II & III colon cancer (O'Connell MJ, *et al.*, *J Clin Oncol*; 2010)
- Relative paucity of recurrent somatic mutations in pediatric neuroblastomas challenges current therapeutic strategies that rely on frequently altered oncogenic drivers (Pugh TJ, *et al.*, *Nature Genet*, 2013)
- HPV associated oropharyngeal cancers are a different clinical entity compared to smoking related head and neck cancers (Ang KK, *et al.*, *NEJM*, 2010; & Fakhry C, *et al.*, *JNCI*, 2008)
- Identification of new recurrent mutations, such as ID3, in Burkitt's & DLBCL opens possibility of better clinical trial design in patients with targetable mutations (Love C, *et al.*, *Nature Genet.*, 2012)

New U24 Banking RFA - Goals

- Support NCTN banking operations/infrastructure
- Consolidate into NCTN biospecimen banking network
- ALL solid tumor & leukemia banking infrastructure & operations with common SOPs
- One U24 banking grant for each new NCTN Group (5 awards)
- Grant PIs – Pathologists, specialists in biospecimen banking
- **NCTN Biospecimen IT Navigator**: common inventory; specimen-data link; search engine for researchers
- **Centralized Front Door process**: access to “legacy” specimens; application tracking, timekeeping
- **One bank for early trials**: CTEP Experimental Therapeutics-Clinical Trials Network ECTN trials

NCTN IT-Navigator Goals

1. Consolidate inventory of biospecimens

2. Connect biospecimens and clinical data

3. Provide biospecimen access to research community

The screenshot displays the NCTN Navigator web application. At the top, the National Cancer Institute logo and name are visible, along with the text 'at the National Institutes of Health | www.cancer.gov'. The main interface shows a search results page with '76,767 Participants' and '653,979 Specimens' counts. A prominent red 'View Results' button is highlighted with a mouse cursor. Below this, a 'Query' section shows a search for 'Adenoma - Villous' with 'Match Criteria' set to 'ANY'. A video player overlay is positioned over the search results, showing a play button and a progress bar at 0:15 / 0:39. To the right, a login section titled 'Powering Next Generation Cancer Research NCTN NAVIGATOR' includes a welcome message, a login form with 'Username' and 'Password' fields, and a 'Log in' button. Below the login form are links for 'Can't Access Navigator?' and 'Guest Access'. A red question mark icon and the text 'Interested In Learning More? Visit Our FAQ' are also present. At the bottom, a 'SCIENTIFIC IMPACT' section titled 'Clinical Trial Biospecimen Utilization' features three articles with thumbnail images and titles: 'MicroRNA expression in cytogenetically normal acute myeloid leukemia' (New England Journal of Medicine), 'Improved survival of patients with human papillomavirus-positive head...' (Journal of the National Cancer Institute), and 'The genetic basis of early T-cell precursor acute lymphoblastic leukemia' (Nature). A fourth article, 'Increased EGFR gene copy number detected by FISH predicts outcome in...', is partially visible on the right (Journal of Clinical Oncology). At the very bottom, a large statistic reads '3,209,756 Total Publications Using NCTN Biospecimens' with the date 'As of November 5th, 2013'.

How To Request Specimens?

- An investigator does not need to be associated with an NCTN Group to request biospecimens.
- The web-based *Biospecimen IT Navigator* will allow investigators to independently query for NCTN Bank biospecimens that meet their criteria, and track their request through the review and approval process.
- The NCTN *Front Door Service* will guide investigators through biospecimen query, application, and regulatory filing procedures.
- The NCTN *Front Door Service* and *Biospecimen IT Navigator* will improve the efficiency and transparency of the biospecimen request process for the entire cancer research community.

NCTN "Legacy" Biospecimen Request Process

