

# CLINICAL PROTEOMIC TUMOR ANALYSIS CONSORTIUM

*Interrogating Cancer Biology to Address  
Clinically Relevant Questions*



## Building a Comprehensive Cancer Atlas

(A Proteogenomic Community Resource)

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*Office of Cancer Clinical Proteomics Research*

*Office of the Director*



- Technology Assessment (2006-2011)
  - ❖ Analytical Reproducibility
  - ❖ Reagents/Public Datasets
- Understanding cancer biology (2011-2016)

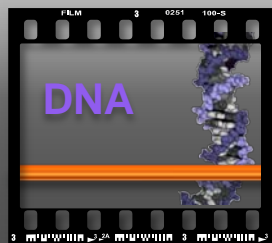
# NCI-CPTAC: Flow of Biological Information

2006

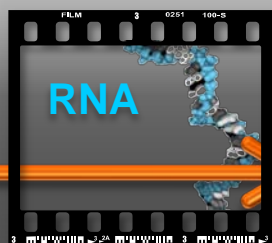
2011

— TCGA — — CPTAC —

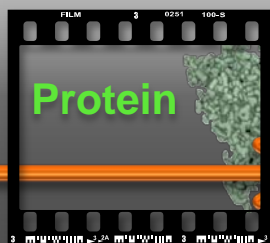
Genomics



Transcriptomics



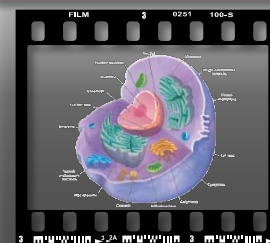
Proteomics



Networks /  
Pathways



Cell/Tissue  
Phenotype



Understanding Gene to Protein to Phenotype

# Map Proteomes to Each Patient's Genome; Develop Assays for Pathways/Candidates



## Inputs

**TCGA  
retrospective  
tumors**



**Prospective  
tumors**



**Verification  
samples**



## Analyses

**Analyze >100 tumors/cancer**

- breast, ovarian, colon
- Proteome
- Phosphoproteome
- Other PTMs

**Targeted protein / PTM**

- Cancer pathways
- Protein isoforms

**Targeted verification of  
“biology-driven”  
biomarker candidates**

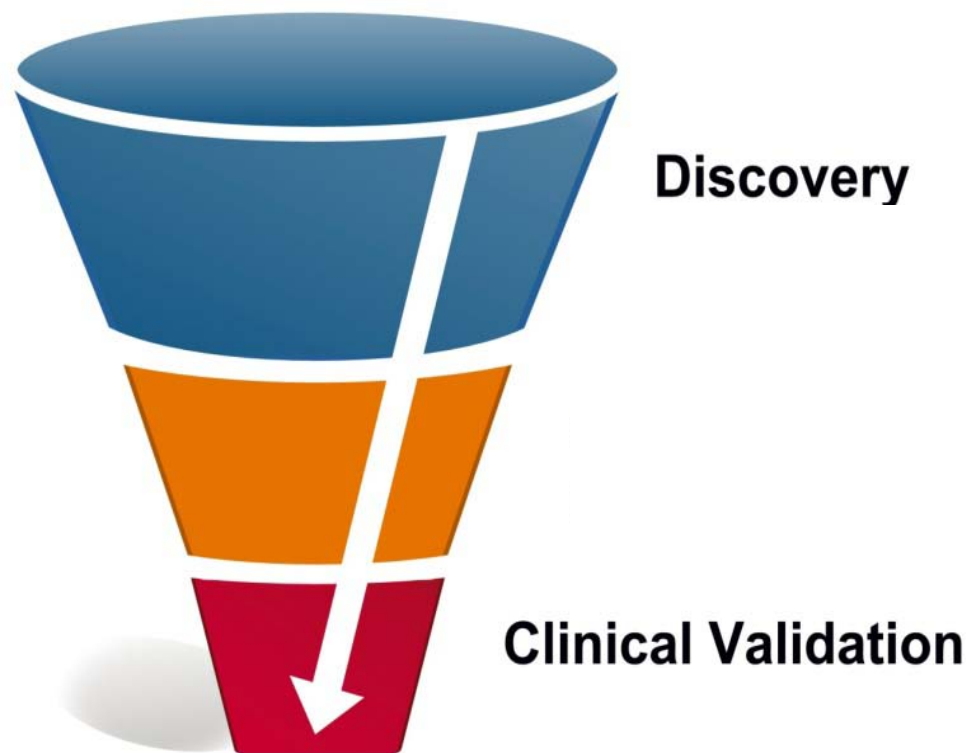
## Outputs

- Molecular signatures
- Genome-proteome relationships
- Genome-signaling relationships
- Protein targets
- Assays (discovered proteins)

- Protein, PTM verification
- Assays, reagents, SOPs

 Cancer Biology Arm     Clinical Arm

# Key Outputs as Community Resources for Proteomics



**Goal:** Demonstrate MRM assay accuracy and reproducibility across labs to measure proteins in plasma



- Platform Validation (analytical)





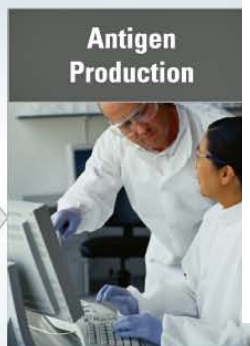
# Affinity Reagents



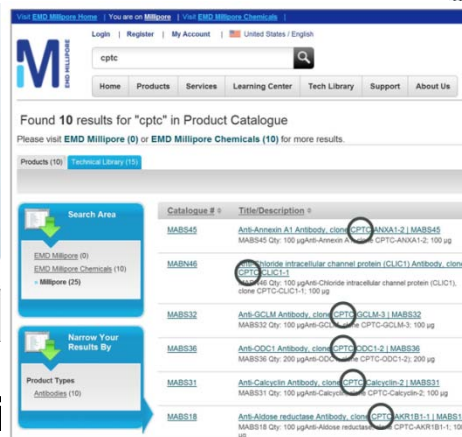
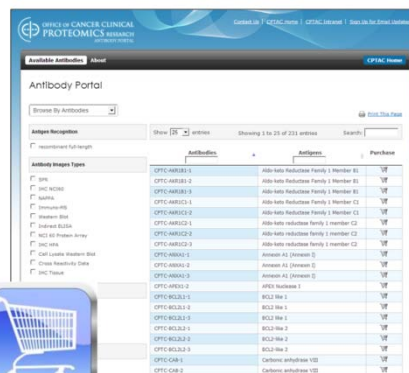
## • Purchasing and/or Licensing the NCI-funded mAbs for distribution

<http://antibodies.cancer.gov>  
(mAb homepage)

### Antibody Characterization



Target Antigens  
provided by  
Investigators



### • Current

### Antibody Characterization

isotype, SDS-  
direct ELISA, Su-  
rce, Immuno-h  
nuno-mass spe

Characterized

man  
A+1-S

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UNIVERSITET

DESIGN  
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Developmental Studies  
Hybridoma Bank at

MYRIAD RBM

Introducing  
OncologyMAP 2.0

One drop. 130 analytes.

Introducing OncologyMAP<sup>®</sup> v2.0

OncologyMAP v2.0 is a powerful research tool developed with funding and direction from the National Cancer Institute and the Cancer Prevention Research Institute of Texas.

OncologyMAP v2.0 is powered by Myriad RBM's Multi-Analyte Profile (MAP) service platform.

Myriad RBM's experts have built a platform optimized to help researchers discover and validate biomarker patterns for use in their drug and diagnostic development efforts.

Comprehensive menu - increases the odds of identifying a pattern  
Multiplexing capability - preserves sample volume  
Rigorous quality standards - ensures reproducible results  
Proprietary blockers - reduces matrix interferences  
Industrialized platform - delivers precise, high throughput processing

### Antibodies.cancer.gov

### Community Access

Access to:  
Characterization  
Data and  
Standard Operating  
Procedures  
at  
antibodies.cancer.gov

# Acknowledgments

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# Community Resources for Proteomics

(<http://proteomics.cancer.gov>)



Resources	Types	Purposes	Web URLs
CPTAC mAbs	Renewable Affinity Reagents (mouse)	WB, IHC, iMRM-MS, ELISA, etc.	<a href="http://antibodies.cancer.gov">http://antibodies.cancer.gov</a> <b>(Assay Portal under development)</b>
CPTAC Data	Raw, Processed & Meta Data	Data for download, query & analyses (Phase I & II)	<a href="https://cptac-data-portal.georgetown.edu/cptacPublic/">https://cptac-data-portal.georgetown.edu/cptacPublic/</a>
FDA mock 510(k)s	Mock Assay Submissions	Illustrating assay procedures for FDA clearance (iMRM-MS & affinity array)	<a href="http://proteomics.cancer.gov/resources/regulatoryscience">http://proteomics.cancer.gov/resources/regulatoryscience</a>
NIST MSQC	QC Software	Monitoring real-time MS "health"	<a href="http://peptide.nist.gov/metrics">http://peptide.nist.gov/metrics</a> <a href="http://massqc.nicorelli.us/">http://massqc.nicorelli.us/</a>
NIST RM8323	Reference Material	Benchmarking MS performance	<a href="http://www.nist.gov/srm">http://www.nist.gov/srm</a>