



OBBR

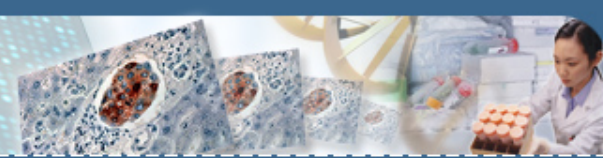
Office of Biorepositories
and Biospecimen Research

Biospecimen Research Network: A Resource for Technology Development

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National Cancer Institute

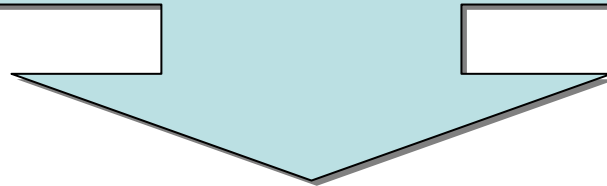




The *biospecimen* - The *personalized* part of personalized medicine

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Window into the health of an individual



Identify targets for drug development, treatment and prevention

Identify biologic variations that determine drug efficacy and drug toxicity

Define markers for susceptibility, screening and reoccurrence

Validate new therapeutics and diagnostics

Biospecimen is still reacting to stresses during its collection, processing, and storage

How can we tell biologic fact from biologic artifact?

Pitfalls for translational research using human specimens:

- **Varying methods** of collection, processing, and storage can alter the physical/biologic state of the specimen
- **Varying associated specimen data** elements alter what the scientist knows about the character/nature of the specimen
- **Variable clinical information** alters what the scientist knows about the patient (biologic context of the specimen)
- **Variable restrictions** (patient consent; other ethical, legal, and policy issues) alter what the scientist may do with the specimen and/or data

Blood is a complex biospecimen



- Travels through all tissues in the body
 - 60,000 miles of vessels
 - Important for tumor growth and metastasis
- Readily collected in the clinic

Numerous Roles:

- delivery of nutrients
- removal of metabolites
- delivery of oxygen
- removal of carbon dioxide
- immune response
- response to injury
- etc...

Complex Composition:

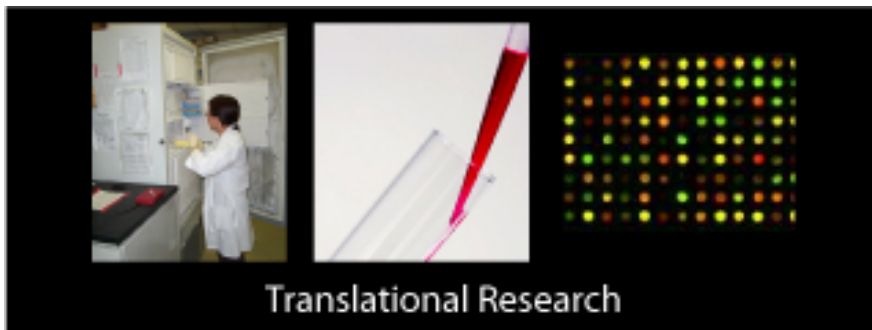
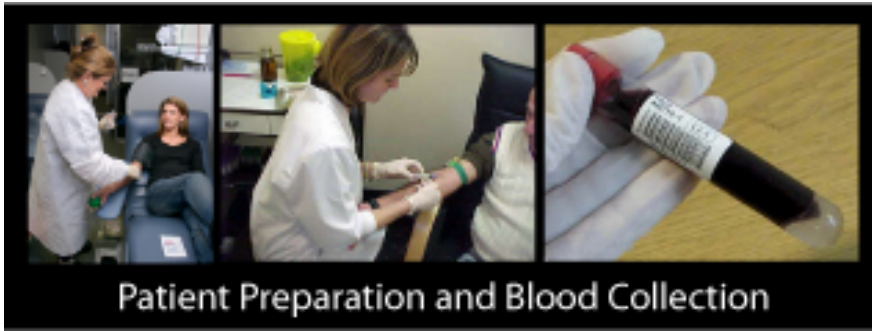
Biologically active!

- red blood cells
- white blood cells
- platelets
- almost every protein
- genomic transcripts
- etc...



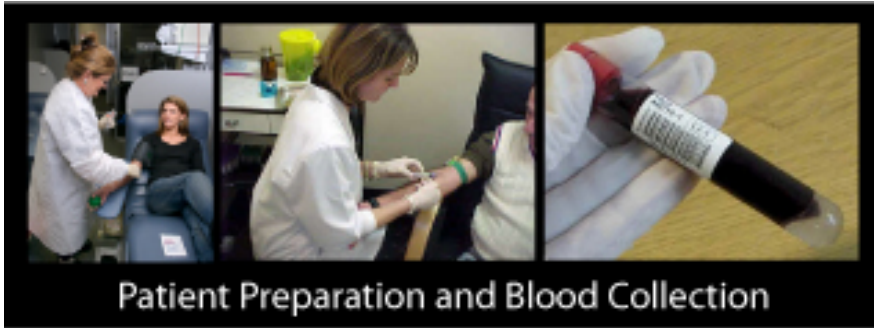
Blood Collection and Processing Variables

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Blood Collection and Processing Variables

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Patient Health, Hydration, Diet

Medications

Patient Position

Tourniquet time duration

Gauge of needle

Order of draw

Type of tube, additives

Blood Collection and Processing Variables

Serum vs plasma vs whole blood

Processing Procedure

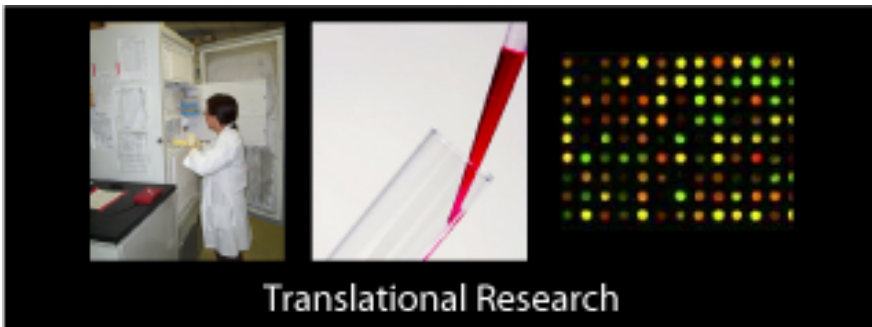
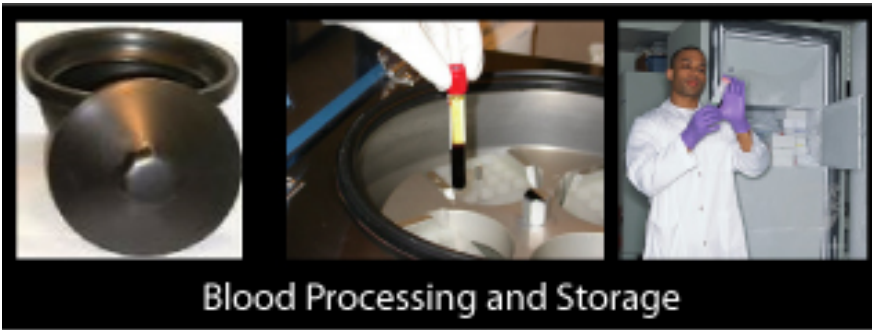
Processing Temperature

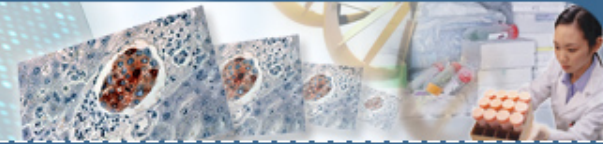
Centrifuge Speed

Centrifuge Temperature

Storage Temperature

Freeze-thaw





Tissue Biospecimens

Variables (examples):

- Antibiotics
- Other drugs
- Type of anesthesia
- Duration of anesthesia
- Arterial clamp time

Time 0

Variables (examples):

- Time at room temperature
- Temperature of room
- Type of fixative
- Time in fixative
- Rate of freezing
- Size of aliquots



Patient

Medical/
Surgical
Procedures

Acquisition

Handling/
Processing

Storage

Distribution

Scientific
Analysis

Restocking
Unused
Sample

Pre-acquisition

Post-acquisition

Office of Biorepositories and Biospecimen Research

The Biospecimen Research Network (BRN)

Service



- Biospecimen Research Database

Search Results

2 Study(s) Found

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Modify Search

[Rai Alex J, Gelfand Craig A, Haywood Bruce C, Warunek David J, Yi Jizu, Schuchard Mark D, Mehigh Richard J, Cockrill Steven L, Scott Graham BI, Tammen Harald, Schulz-Knappe Peter, Speicher David W, Vitzthum Frank, Haab Brian B, Siest Gerard, Chan Daniel W](#)

Specimen: Fluid /Plasma /Frozen / None /

Platforms: Protein - 1D/2D gels / Protein - Mass Spec /

The presence of protease inhibitor (PI) cocktail appears to perturb the native profiles of several proteins, particularly higher abundance proteins including apolipoprotein A1, apolipoprotein A2, haaptoglobin (alpha and beta subunits). transthvretin and fibrinoen - as defined by in-gel trvotic
Proteomics ,2005 ,Vol. 5 ,Page 3262

PubMed

[Rai Alex J, Gelfand Craig A, Haywood Bruce C, Warunek David J, Yi Jizu, Schuchard Mark D, Mehigh Richard J, Cockrill Steven L, Scott Graham BI, Tammen Harald, Schulz-Knappe Peter, Speicher David W, Vitzthum Frank, Haab Brian B, Siest Gerard, Chan Daniel W](#)

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HUPO plasma samples show significant differences compared to reference plasma collected according to BioVisioN sample protocols, perhaps due to investigation of different protocols for EDTA/citrate specimen collection in this studv- a maior findina is the detection of platelet-derived
Proteomics ,2005 ,Vol. 5 ,Page 3262

PubMed

2 Study(s) Found

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Modify Search

Office of Biorepositories and Biospecimen Research

The Biospecimen Research Network (BRN)

Service



- Biospecimen Research Database
- Annual BRN Symposium

*Advancing Cancer Research Through
Biospecimen Science*

<http://www.brnsymposium.com>

March 2008 Symposium

Pat Brown MD PhD (Stanford)

Pitfalls and Gaps in Research Using Human Biospecimens

Steve Gutman MD (US FDA/OIVD)

FDA and Biospecimens: Going for the Gold

Scott Patterson PhD (Amgen)

Signal:Noise? The Importance of the Pre-Analytical Phase
in Sample Storage

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2009 Symposium

March 16-19, 2009

Bethesda North Marriott Hotel & Conference Center
Bethesda, Maryland

Two days of scientific talks
One day of interactive workshops
Registration open soon

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Research

- NCI BRN Laboratory
- Extramural Funding



Innovations in Cancer Sample Preparation

“...sample collection, processing, isolation, storage, purification, preservation, and, in the case of stored tissues, reversal of adverse events resulting from storage and preservation.”

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The screenshot shows the FedBizOpps.gov website interface. At the top is a navigation menu with links for Home, General Info, News, Opportunities (highlighted), Agencies, and Privacy. Below the menu are links for Buyers (Login | Register) and Vendors (Login | Register), along with an Accessibility link. The main content area features the National Institutes of Health logo and the title "R&D on Human Biospecimen Integrity". Below the title, it lists the Solicitation Number (508-280), Agency (Department of Health and Human Services, Office, National Institutes of Health), and Location (National Cancer Institute).

FedBizOpps.gov

Solicitation # 08-280

"...biospecimen integrity assessment tools, protocols, and QA/QC measures needed to yield reproducible, high quality data from R&D efforts that utilize biospecimens."

More information can be found on website
Deadline extended until December 9, 2008 (2pm)

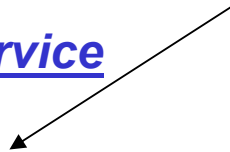
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More opportunities to be announced

<http://biospecimens.cancer.gov>

Research

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- Extramural Funding

E-mail biospecimens@mail.nih.gov to be added
to our listserv

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The Biospecimen Research Network (BRN)

Service

- Biospecimen Research Database
- Annual BRN Symposium

Research

- NCI BRN Laboratory
- Extramural Funding

Collaboration

- Working Groups and Workshops
- Training new biospecimen scientists



2008 Experimental Design Workshop
Publication in preparation



Center to Reduce Cancer Health Disparities



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Office of Biorepositories
and Biospecimen Research

More information?

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<http://biospecimens.cancer.gov>

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