UCSF Guide for the Research Use of Human Biological Specimens: Collecting, Banking and Sharing Specimens

May 2005 (links on document updated 7/2010)

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Preface

UCSF is proud to house several world-class human biospecimen banks and fortunate to be home to many dedicated researchers who have consistently contributed to the knowledge base arising from the innovative study of human biospecimens. Early on UCSF researchers recognized the tremendous potential held within carefully banked specimens and now, the entire UCSF research community is well-poised at the forefront of molecular and translational medicine.

Based on a great deal of collective learning, this Guide was developed to provide researchers with a concise practical reference to the many administrative and regulatory topics related to conducting research with human biospecimens at UCSF. With new and updated information distilled into one location, the Guide is suitable for new investigators as well as those who already have active biospecimen research studies underway.

This Guide is not intended to be an operations manual for specimen banks or a definitive regulatory and policy handbook on human biospecimen research. It does not address the legal and regulatory issues pertaining to the University’s Willed Body Program or to tissues used in transplantation procedures. It is organized to provide a framework for finding key information about UCSF requirements, including brief overviews on topics related to human biospecimen banking with many linked references to additional details and resources.

I know we all share the belief that the current genomic era holds unprecedented promise for revealing better ways to diagnose and treat disease. It is our sincere hope that this Guide helps you fulfill the necessary administrative and regulatory requirements with greater ease so that your research can proceed in pace with this exciting field of study.

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University of California, San Francisco
May 2005
The UCSF Guide for the Research Use of Human Biological Specimens: Collecting, Banking and Sharing Specimens was developed under the guidance and support of Executive Vice Chancellor A. Eugene Washington and Associate Vice Chancellor Ara Tahmassian of the Office of Research.

The Guide was written, compiled and edited by a team of individuals who share a strong commitment to assisting UCSF investigators in their research efforts. The core team was led by Sharon Friend, Director of the Human Research Protection Program, and included representatives from several UCSF departments: Liz Tioupine, Coordinator, The Committee on Human Research; Kelly Dinglasan, Assistant Director, and Katherine Ho, Director, Office of Sponsored Research; Karen Chew, Tissue Core Manager, Comprehensive Cancer Center; Yvonne De Souza, Co-Director UCSF AIDS Specimen Bank/Director of Technical Operations, SICCA, Department of Orofacial Sciences; Leslie Wolf, Assistant Adjunct Professor, Department of Medicine; Vicky Kirby-Martin, Associate Privacy Officer, Medical Center Administration; and Teri Melese, Director of Research Technologies, School of Medicine Dean's Office. The organization, writing, and completion of this resource are due primarily to the skilled efforts of Elaina Mann, Senior Writer and Analyst in the Human Research Protection Program.

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Special thanks and acknowledgement is given to Irene Anicetti for transforming the Guide into a web-based resource.
I. Introduction

- Who will use this Guide? This guidance is designed to support investigators who wish to use human biological specimens in their research, and/or those researchers who intend to establish or manage specimen banks and repositories for human specimens to be used by others for research. This Guide does not address topics related to the University’s Willed Body Program or to tissue banking for transplantation purposes.

Specific topics covered in this Guide include:

- Accessing and using existing specimens residing in tissue banks and repositories
- Collecting biospecimens from human subjects for your own research use, or collecting to establish a specimen bank
- Receiving biospecimens from other sources for retention in a UCSF-based bank
- Sharing biospecimens with other researchers, institutions, or companies
- Using human stem cell lines [Section under development. Please refer to the UCSF Stem Cell homepage for current policies and procedures.]

- What are the goals of this Guide? This Guide aims to provide practical information in a user-friendly format allowing researchers to navigate University policies and approval procedures so that research projects can move forward. The Guide:

  - Presents some of the best practices used by model facilities at UCSF
  - Links to application forms, templates and explanations for all required approvals
  - Provides practical information regarding important federal, state and local regulations, and when appropriate, lends real-world interpretation to important regulations governing the use of human biological specimens
  - Provides links to more detailed information within the UCSF system and elsewhere
II. Brief Overview

Section Summary: This section contains basic introductory information about human biospecimens, institutional oversight and the protection of private information.

- Types of Human Biological Specimens
- Formats for Collecting and Storing Biospecimens
- Tissue Banks and Repositories
- Information Management
- Protection of Private Health Information
- Institutional Oversight of Research Involving Human Biospecimens
- Categories of Human Specimen Information: Terms and Definitions

**Types of Human Biological Specimens:** Most human biological specimens come from samples collected for diagnostic or therapeutic procedures, but other sources can include autopsies, volunteer donors, or materials collected and shared by other researchers.

- The term “biospecimen” is used widely and encompasses a full range of human specimen types including:
  - Sub-cellular components such as DNA or RNA
  - Cells or tissues from any part of the human body
  - Organs such as liver, bladder, kidney, heart, placenta, etc.
  - Gametes (ova and sperm)
  - Embryos and fetal tissues
  - Bodily products such as teeth, hair, nail clippings, sweat, urine, feces
  - Blood and blood fractions: plasma, serum, buffy coat, red blood cells
  - Saliva and buccal cells

- Exceptions: Organisms, such as bacteria and viruses, isolated from human specimens are not human biological specimens.

**Formats for Collecting and Storing Biospecimens:** Depending on the type of specimen, researchers are usually given aliquots or sections of a specimen in a collection and not the entire specimen. The various formats for collecting and storing biospecimens include:

  - Frozen, formalin-fixed or paraffin-embedded tissues
- Histological slides
- Aspirates, body fluids, swabs
- Guthrie cards
- Tissue culture
- Extracted DNA and RNA

**Tissue Banks and Repositories:** Various terms are used to designate the storage sites for human biological collections. The most common are defined below.

- **Repository** is a term usually applied to large formal collections of specimens and/or data. Examples include:
  - The Cooperative Human Tissue Network
  - The DNA Specimen Repository for Remains Identification

- **Tissue bank** generally refers to smaller collections of specimens, which may be specific to an institution, disease, or even to specimens in a researcher’s freezer. Examples include:
  - The Department of Neurological Surgery at UCSF maintains a Research Core Facility that includes a specimen bank.
  - The UCSF Helen Diller Family Comprehensive Cancer Center Tissue Core which maintains a centralized database for specimens collected for all Cancer Center programs (breast, prostate, lung).

**IMPORTANT NOTE:** “Tissue banking” also refers to tissues, cells and organs collected and processed for transplantation. Tissue banks engaged in transplantation services are subject to FDA oversight under Section 361 of the Public Health Service and 21 CFR Part 1270. The American Association of Tissue Banks is an excellent source of information regarding the regulatory standards, certification, and accreditation of tissue banks that provide materials for transplantation.

- **Banks with Extracted DNA and/or RNA** refer to facilities that store extracted nucleic acids. For example, the DNA Bank at UCSF isolates and stores DNA for CHR-approved studies in a monitored environment ensuring sample quality and data security.

- **Information Management:** Regardless of specimen bank size, an inventory database is needed to track specimens and any associated data. Information is usually managed by a group of specific data fields, such as,
  - Specimen code/ID number
  - Specimen storage unit location
  - Specimen type, condition and amount
  - Diagnosis
• Typically, data fields are organized to facilitate sample storage and retrieval as well as to support efficient management of specimen-related data. Information management systems can range from a single spreadsheet to numerous, highly sophisticated relational databases.

• The amount and type of data can vary widely among repositories and banks depending upon the mission and function of the organization.

• Information management and data security are discussed more fully in the section Establishing, Operating and Maintaining a Biospecimen Repository.

**Protection of Private Health Information:** There are restrictions for accessing and using the personal identifying data that may be associated with human biospecimens.

- Researchers who manage human specimen data, and other investigators who have access to it, are legally and ethically obligated to protect data that is considered private information.

- Researchers who obtain specimens from tissue banks and repositories often receive samples with a “limited data set.” This is to protect the identity of the subject/patient without compromising the goals of conducting meaningful research. A limited data set must have all the direct identifiers removed, and may include the following information:
  - Admission, discharge, and service dates;
  - Year of birth, and if applicable, death;
  - Age (including age 90 or over); and five-digit zip code or any other geographical subdivisions, such as state, county, city, precinct and their equivalent geocodes (except street address)
  - Treatment response and outcome data
  - Family history information (i.e. cancer risk, gene mutation, etc.)

**Institutional Oversight of Research Involving Human Biospecimens:** Specimen collection from subjects, use, and banking of human specimens for research require approval by various regulatory committees at UCSF. The approval process is discussed in detail in the Getting Started: Requirements for Working with Human Specimens at UCSF.

**Categories of Human Specimen Information: Terms and Definitions:** For regulatory purposes, human specimens are categorized based on the level of identifiers associated with them. Appendix A shows the designated categories which determine the level of IRB oversight.
III. Getting Started: Requirements for Working with Human Specimens at UCSF

**Section Summary:** This section contains information about the approvals required before investigators can begin working with human biospecimens.

What approvals do I need to work with human biospecimens?

- The Biosafety Committee
- The Committee on Human Research
- Institutional Animal Care and Use Committee
- Radiation Safety Committee
- Office of Sponsored Research

**What approvals do I need to work with human biospecimens?** Approvals are needed from several departments and oversight committees before receiving and working with human biospecimens.

- Approval from the Biological Safety Committee in the form of a Biological Use Authorization (BUA) number is required to work with human-derived specimens. A BUA is a prerequisite for approval by the Committee on Human Research (CHR) described below.
  - All staff must be trained annually in handling blood-borne pathogens.
  - Researchers at the Veterans Administration Medical Center contact the VA Research Office at (415) 221-4810 x 4655.

- The Committee on Human Research (CHR) is the federally mandated Institutional Review Board (IRB) at UCSF and is part of the Human Research Protection Program in the Office of Research.
  - CHR approval is required for all projects involving any material covered under the human subject definition [45 CFR Part 46.102(f)].
    
    *Human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains
    1. Data through intervention or interaction with the individual, or
    2. Identifiable private information." [45 CFR Part 46.102(f)]
  - CHR approval is required for all projects involving any material covered under the human subject definition [45 CFR Part 46.102(f)].
  - The CHR, not the investigator, determines whether specimen research involves “human subjects.”
  - The level of CHR review and approval depends on the level of risk the study poses to subjects.
  - Studies that use existing specimens that are stripped of identifiers (unlinked or de-identified) pose less than a minimal risk and, generally, require less CHR oversight.
Study procedures that pose greater than minimal risk to subjects - collection of private information and/or collection of specimens by more invasive means than a blood draw - require greater CHR oversight.

CHR requirements are detailed in the guidelines titled Research Using Human Biological Specimens.

- If samples are radioactive you will need a Radiation Use Authorization (RUA) number from the Radiation Safety Committee.

- Approval from the Institutional Animal Care and Use Committee (IACUC) is needed if the human tissues/specimens will be used in animal research.

- The Office of Sponsored Research (OSR) assists investigators with all contractual arrangements needed to provide clinical or laboratory services for a clinical study or to send and receive materials including human biological specimens.
  
  o Contact the Industry Contracts Division of OSR and complete a Material Transfer Agreement (MTA) before sending or receiving human specimens.
    
    - An MTA is required for all exchanges of materials, incoming and outgoing, unless the specimens are purchased from a commercial entity.
    
    - More detailed information is provided in Sharing Biospecimens and Data with Other Researchers, Institutions or Private Companies.
IV. Accessing and Using Existing Specimens from Tissue Banks and Repositories

Section Summary: This section contains information for researchers who obtain existing specimens from repositories and who are not directly involved with subjects from whom the specimens originate.

- How do I get specimens from tissue banks (public, private and commercial repositories)?
- What are the informed consent issues for accessing existing specimens?
- How do I locate specimen resources?

- How do I get specimens from tissue banks (public, private and commercial repositories)? Before applying to any repository or specimen bank, you must first obtain approvals to work with human specimens at UCSF. (see Getting Started)

Various types of tissue banks and repositories are described briefly below:

- **Federally funded or cooperative group banks** usually have well-defined prioritization and distribution methods. Be prepared to provide a Letter of Intent (LOI) or a study protocol describing your research plan. Applications are generally reviewed by an oversight committee and judged on scientific merit, statistical validity, the investigator’s ability to conduct the proposed research, and the appropriateness of the sample size requested to accomplish the research goals.

- **Departmental/Division/ORU banks and investigator-maintained collections** may not have well-established application or distribution policies and may not be obligated to share specimen resources at all. Contact the tissue bank’s administrator to find out how to obtain specimens.

- **Commercial Tissue Banks**: Specimens may be available for purchase from commercial sources. The resource table below provides links to some companies providing a broad array of human specimens including tissues, blood and DNA.

- **Private Collections**: Individual researchers who are collecting specimens in your area of research may be willing to provide them. Contact the researcher directly to find out if collaboration is an option and the conditions for transferring or sharing specimens.

- What are the informed consent issues for accessing existing specimens? If you are obtaining human specimens from another source:

  - Obtain source documentation stating that the specimens were obtained with a valid informed consent under an IRB-approved protocol, and

  - The study should adhere to the scope of research allowed by the original consent.

**IMPORTANT NOTE:** Specimen repositories and sources from outside the United States should be able to supply comparable documentation regarding consent of research subjects and conditions for specimen use.
**How do I locate specimen resources?** The lists below represent a few of the growing number of specimen banks and repositories within the UCSF system as well as publicly funded specimen banks and commercial sources of human tissues.

- Some of the banks that house specimens collected at UCSF, as part of federally funded, multi-center trials (CALGB, COG, RTOG, AIDS and Cancer Center Bank), reside at national off-site locations.

- Each bank has policies and procedures governing the distribution of specimens to members, other UCSF researchers, and outside entities.

<table>
<thead>
<tr>
<th>UCSF SPECIMEN BANKS <em>(partial listing)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTE:</strong> Reposition for data, DNA, and tissues at UCSF. Can be accessed directly through the various research units or through the CTSI Core Database at the virtual home for Clinical and Translational Science</td>
</tr>
<tr>
<td><strong>UCSF Helen Diller Comprehensive Cancer Center Tissue Shared Resource</strong></td>
</tr>
<tr>
<td><strong>UCSF AIDS Specimen Bank</strong></td>
</tr>
<tr>
<td><strong>The UCSF DNA Banking Facility</strong></td>
</tr>
<tr>
<td><strong>UCSF Liver Center Clinical and Translational Research Core</strong></td>
</tr>
<tr>
<td><strong>The Neurosurgery Tissue Bank</strong></td>
</tr>
<tr>
<td><strong>Oral Cancer Research Center (OCRC)</strong></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>PUBLICLY FUNDED SPECIMENS BANKS (US and Global; <em>partial listing</em>)</th>
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<tbody>
<tr>
<td><strong>Cooperative Human Tissue Network</strong></td>
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<tr>
<td><strong>Coriell Cell Repository</strong></td>
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<tr>
<td><strong>AIDS and Cancer Specimen Resource</strong></td>
</tr>
<tr>
<td><strong>The CALGB Leukemia Tissue Bank</strong></td>
</tr>
<tr>
<td><strong>RTOG Tissue Bank/Translational Research Program</strong></td>
</tr>
<tr>
<td><strong>National Human Radiobiology Tissue Repository</strong></td>
</tr>
<tr>
<td><strong>Tuberculosis Specimen Bank (WHO)</strong></td>
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<table>
<thead>
<tr>
<th>COMMERCIAL SOURCES OF HUMAN SPECIMENS <em>(partial listing)</em></th>
</tr>
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<tbody>
<tr>
<td><strong>Ardais</strong></td>
</tr>
<tr>
<td><strong>Asterand</strong></td>
</tr>
<tr>
<td><strong>Genomics Collaborative</strong></td>
</tr>
<tr>
<td><strong>LifeSpan</strong></td>
</tr>
</tbody>
</table>
V. Collecting and/or Receiving Human Specimens for Banking

**Section Summary:** This section contains information for researchers engaged in prospectively collecting specimens from subjects and/or receiving specimens from clinicians for banking.

- What approvals do I need to prospectively collect and/or bank human specimens?
- What kind of information can be collected with specimens?
- What are the consent requirements for collecting and banking human specimens for research?
- What are the consent requirements for collecting specimens from minors?

**What approvals do I need to prospectively collect and/or bank human specimens?** If you are involved in collecting specimens from research subjects or intend to receive specimens from clinicians for banking purposes, you will need to obtain protocol approval from the CHR as outlined in the CHR guidance Research Using Human Biological Specimens.

- For more information on required approvals, refer to the section Getting Started: Requirements for Working with Human Specimens at UCSF.

**What kind of information can be collected with specimens?** The type of information collected and retained with specimens will depend on the mission and objective of the repository. The table below shows the type of information that is considered personally identifiable (identified) or de-identified – both may be associated with banked specimens.

<table>
<thead>
<tr>
<th>TYPE OR ASSOCIATED INFORMATION</th>
<th>EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IDENTIFIED</strong></td>
<td></td>
</tr>
<tr>
<td>Patient Identifiers (Name, Medical Record Number)</td>
<td></td>
</tr>
<tr>
<td>Family History (Pedigree)*</td>
<td></td>
</tr>
<tr>
<td>Treatment and Outcome Data*</td>
<td></td>
</tr>
<tr>
<td><strong>DE-IDENTIFIED</strong></td>
<td></td>
</tr>
<tr>
<td>Histopathology</td>
<td></td>
</tr>
<tr>
<td>Specimen Descriptors (Type, Condition, Amount)</td>
<td></td>
</tr>
</tbody>
</table>

*Patient identifiers may be needed to access long-term follow up information.

**IMPORTANT NOTE:** Information can be collected only as specified in the CHR-approved protocol.

- **What are the consent requirements for collecting and banking human specimens for research?** Consent to collect, to use, and/or bank specimens for research can be obtained using a variety of different formats – all requiring CHR approval.

- Several factors determine the type of consent materials required to obtain specimens for research:
o Will the specimens be collected from surplus surgical material that would be otherwise discarded?
o Will the specimens be banked for future research use?
o Will the specimens be collected for research under a companion study that is part of a treatment or intervention study?
o Will the specimens be collected as part of a specimen banking protocol?
o Refer to the CHR guidelines Research Using Human Biological Specimens for a detailed description of the various types of study protocols used to collect specimens and the consent requirements for each.

**IMPORTANT NOTES:**
The topics described above should be addressed, as applicable, in consent forms for research studies proposing to collect and bank biospecimens for research purposes. The study and the consent form must be approved by the CHR.

Consent forms for transplantation research, autologous vaccine development, or similar research designed to study collected biological materials as treatments, need to address issues specific for those types of studies. The study and the consent form must be approved by the CHR.

Transplantation procedures conducted as part of clinical practice are not research and do not require CHR approval. The consent form should adhere to requirements specified by the hospital where the patient is treated.

**What are the consent requirements for collecting research specimens from minors?** For detailed information on obtaining informed consent/assent for minors, refer to the CHR guidelines Minors in Research. The requirements for minors are age-dependent as shown in the table below:

<table>
<thead>
<tr>
<th>Age of Minor Participant</th>
<th>Written Assent Form Required</th>
<th>Separate Parental Consent Form Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant -7 years old</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>7-12 years old</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>13-17 years old (Option A)</td>
<td>Yes</td>
<td>No (add line to adolescent assent form for parents to sign)</td>
</tr>
<tr>
<td>13-17 years old (Option B)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**IMPORTANT NOTE:** If there is continued interaction with subjects who reach the age of majority (18 years of age in California), it would be appropriate to discuss in the consent form the continued storage and analysis of biological materials previously collected.
VI. Establishing, Operating and Maintaining a Biospecimen Repository

Section Summary: This section provides information for researchers who are interested in setting up, operating, and maintaining a specimen bank or repository.

- Do I join or collaborate with an existing bank/repository or establish my own?

- How do I establish a repository at UCSF?
  - University Requirements
  - Facilities and Equipment
  - Operations

- What are some examples of model banks at UCSF?

- How do I handle information security?
  - What is information security?
  - What do the HIPAA security and privacy regulations require?
  - What do I need to consider for physical security?
  - What do I need to consider for electronic security?
  - What if I am the systems manager of the database?
  - How do I get rid of PHI storage devices?
  - What if I suspect there has been a breach of security?
  - Table: Information Security Do’s and Don’ts

- Do I join or collaborate with an existing specimen bank/repository or establish my own? The following resources may help you decide whether to use existing specimen repositories at UCSF to store your samples or to set up your own bank.
  - A discussion with your Program Director or MSO is a good place to start. It is important to understand the department’s overall mission and policies regarding specimen banking.
  - Becoming familiar with the operations of some of the model specimen banking facilities at UCSF may be useful.
  - An extensive report from the RAND Corporation, available for download or purchase, provides excellent information including best practices of model facilities within the United States.

- How do I establish a repository at UCSF? In addition to securing the necessary approvals required to have a specimen bank/repository at UCSF, a successful operation requires robust management of all functional areas. The following section provides information regarding University requirements as well as points to consider for setting up...
the facility intended to house the specimen collection and the policy and procedures required
to manage the facility’s operation.

- **University Requirements:** You will need to obtain specific approvals from the various
  University oversight committees as described in the section Getting Started: Requirements
  for Working with Human Specimens at UCSF.

- **Facilities and Equipment:** Although space and equipment needs may vary widely, the
  following lists provide some important points to consider and will likely apply to most
  facilities that house specimen banks:
  
  - Specimen Banking Space [Appendix B]
  - Specimen Banking Equipment [Appendix C]
  - Specimen Storage and Labeling [Appendix D]
  - Emergency and Backup Plans [Appendix E]

  **IMPORTANT NOTE:** An emergency action plan includes
  creating and maintaining a current contact list of key personnel. The list should be posted and/or readily available for all
  emergency responders.

- **Operations:** A successful specimen bank should have an effective operational plan for
  specimen acquisition, handling, tracking, distribution, and **final disposition.** A well-
  developed operational plan will include **written policies and procedures,** as well as a
  secure system for managing **records.** Some suggestions to consider for each area are
  shown below:

  - **Policies:** Written policies help establish and fulfill the mission and objective of
    the specimen bank.

    - Policies that govern specimen bank operations must be consistent with
      those of the University, including policies on:

      - **Confidentiality and Privacy:** Refer to the HIPAA homepage for details.
      - **Certificate of Confidentiality:** To protect health data and
        biospecimens used in research from forced disclosure (subpoenas and
        court orders), investigators may apply to the Department of Health and
        Human Services for Certificates of Confidentiality. Certificates may be
        granted regardless of the funding source; the NIH encourages
        investigators to apply. For additional CHR guidance see Consent
        Process—Certificate of Confidentiality.
      - **Safety:** Researchers and staff who handle human biological materials
        must receive appropriate safety training.
      - **Merging and/or closing specimen banks:** The University recommends
        that investigators who separate from UCSF transfer all or part of their
        collection to one of the several large, well-managed repositories operating
        at UCSF.

      - Other policies adopted by a particular specimen bank depend on the mission
        and objective of the bank. For example,

      - **Access and Utilization Review:** An informal policy for access and utilization review
        may be adequate for a small specimen bank serving a limited number of
        investigators within one department. However, a large
repository with many applicants from scientifically diverse disciplines may require a more stringent and formal policy for access and utilization review. Suggested utilization review procedures are discussed below in Procedures.

- **Staff Training:** With the exception of safety training, the specific type of staff training will be determined by the type of services provided by the specimen bank and may include specimen processing techniques, database management or quality assurance methods.

  - **Procedures:** Written Standard Operating Procedures (SOPs) facilitate staff training and ensure specimen banking activities will be carried out consistently.

- **Specimen Handling:** Clearly defined procedures are needed to coordinate with the clinical team who will collect the specimens according to CHR-approved protocols.

  Obtain informed consent for specimen use and/or banking.

- **Specimen Labeling and Storage:** Procedures should describe a consistent method for labeling:

  Specimens must be labeled with a code or number
  Initials are not permitted and should not be part of the code.

  Any patient identifier must be separated from the specimen and kept in a separate secure file that is not linked to the specimen inventory database.

  See the Specimen Storage and Labeling List [Appendix D] for guidance on the types of labels, marking pens and specimen containers to use.

- **Inventory and Database Management:** Specimen banks, regardless of size, should have established procedures for data collection, entry, retrieval, and verification. Detailed guidance on information and database security is provided.

- **Quality Assurance:** Written procedures describe the methods and criteria to use to assess the quality and suitability of specimens and associated data.

- **Utilization Review:** The process for utilization review – whether conducted by one person or a committee of diverse individuals – should ensure valuable specimens are used wisely. Some topics commonly considered by specimen utilization committees are described in the section Sharing Biospecimens and Data with Other Researchers, Institutions or Private Companies.

- **Records:** A secure system must be in place for keeping both paper and electronic records.

- **Paper Documents:** Approvals from oversight committees usually are in the form of a letter and must be filed in a secure place. Additional paper documents may include a variety of consents forms – surgical consents, clinical trial consents, or consents specifically for specimen banking. To maintain confidentiality and privacy paper files should be stored in locked cabinets.
Electronic Records: Databases should be password-protected and access restricted to essential research personnel. Database and information security are discussed in detail elsewhere.

What are some examples of model banks at UCSF? Several banks at UCSF demonstrate model practices in specimen acquisition and processing, utilization review and distribution.

• UCSF AIDS Specimen Bank (ASB): The ASB was established in 1982 as a repository for tissue biopsies and serum specimens for investigators involved in identifying the causative agent for AIDS. Through its well-established procedures [Appendix F] ASB has fostered many collaborative research projects between depositors and investigators world-wide.

• UCSF Comprehensive Cancer Center Tissue Shared Resource: The Cancer Center Tissue Core is a large, histologically diverse tissue bank with a well-established infrastructure that supports a broad range of services for researchers from Mt. Zion, SF General and Moffit hospitals. Many best practices are demonstrated in the Tissue Core’s specimen collection and distribution procedures. (Appendix G)

How do I handle information security? Several important topics are discussed below. Investigators must be aware that

Information security is the responsibility of all researchers who create, use, or distribute health-related data.

• What is information security? Information security includes, but is not limited to the following:
  o The physical protection of hardware and data.
  o The electronic protection of records stored on permanent workstations and servers as well as on portable devices including laptops, PDA’s, text pagers, and portable hard drives.
  o The protection of data transmitted via electronic means such as email, wireless, ftp, internet servers.

IMPORTANT NOTE: Sending secure Email messages at UCSF is described elsewhere.

In addition to federal regulations governing privacy and confidentiality, such as the HIPAA privacy and security protection requirements and state identity theft laws, there are also University computing standards, procedures and guidelines for information security both at the UC system wide level and for each campus. These are being updated to incorporate federal and state requirements.

Important links for UCSF Medical Center IT procedures and policies are:

Campus IT Services: Security
UCSF Medical Center IT
Carl Tianen as contact person
• **What do the HIPAA security and privacy regulations require?** Databases that include protected health information must comply with HIPAA’s stringent requirements for security.

  o Security regulations require documentation showing that reasonable procedures and policies are in place for both the physical and electronic security of systems that contain electronic PHI, including administrative and technical standards.

  o Current UCSF policies and guidelines for procedures:
    - UCSF HIPAA Website
    - CHR FAQ on protecting data security

  **IMPORTANT NOTE:** UCSF information security policies and procedures must be addressed regardless of whether PHI or coded information is stored electronically in the database.

  o By having the three following plans, your registry systems can be adapted to address any additional security requirements:

    1. **Tracking System:** The specimen bank must be able to account for how its information, specimens, and data are accessed, used, transmitted, and shared, e.g. the actual flow into, within, and out of the system.

    2. **Recovery Plan:** The specimen bank must be able to recover its inventory database if it is lost due to physical destruction (fire, earthquake, or flood) or due to malicious electronic hacking.

      a. It can be in any format, such as a hard disk, backup hard drive, and rented commercial storage.

      b. Recovery/backup items must be kept physically separate from the database.

      c. It is critical that the recovery materials are tested for recoverability before an emergency.

    3. **Security Plan:** Both physical security and electronic security plans must address controlling physical and electronic access to your registry database. These should be designed to protect the database and collection from inadvertent disclosure, loss, or theft.
• **What do I need to consider for physical security?** Physical security includes controlling access to the facility, the workstation, and any type of electronic device that may contain electronic PHI. However, for security reasons you should also consider controlling access to the specimens and any data on specimen labels as well as controlling disposal of portable media and devices or PHI.

  o **Specimens:**
    - Are identifiers physically located on sample container when it arrives?
    - Are identifiers marked on specimen for storage?
    - If receiving a data storage device or media, has it been screened with antivirus software prior to encryption or formatting?

  o **Physical site:**
    - How is access to the physical site restricted or controlled?
    - How is access to the database workstation controlled?
    - Is access to specimen storage containers controlled?
    - Are systems protected from inadvertent viewing of workstation screens?
    - Are hard copies of data (disk, paper, portable electronic devices) secured in an area completely separate from the main system?
    - What is the plan for destruction of any materials no longer in use, especially the disposal of old hard drives which must be wiped before disposal? This is also true for reuse of devices and media.

• **What do I need to consider for electronic security?** Never assume that a server, network or workstation is secured, especially if the system has electronic connectivity to other systems such as the internet or email.

  o You must know the level of protections for the network that your repository resides on. Always confirm with IT (not just the vendor) that your applications and hardware can be supported by IT and they will provide protection at a level expected by UCSF. ([Information on securing servers](#))

  o Your department or IT can validate the security of your registry both for electronic access and electronic transmission of electronic PHI (ePHI).

  o California identity theft laws ([California’s SB1386](#)) mandate that the loss of certain identifiers must be reported to every single individual involved in the loss. Know if these identifiers are in the database and how they are protected.

  o As information security procedures, policies, and guidance becomes available, they will be posted on various UCSF websites.

    - [UCSF HIPAA Implementation website](#)
    - [UCSF HIPAA Departmental Compliance](#)
    - [IT Services for Security](#)
Basic guidelines for electronic protection of repository systems are shown in the table below: (See UCSF Resources)

<table>
<thead>
<tr>
<th>CONTROLLING DATABASE ACCESS</th>
<th>CONTROLLING ELECTRONIC CONNECTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Databank protection</strong> (firewalls, secure zones)</td>
<td>Do not have email capability, internet access or other type of modem activity on workstations linked to the central specimen database.</td>
</tr>
<tr>
<td><strong>User ID and password management</strong></td>
<td>Do not allow wireless or remote FTP to central databases which house ePHI unless IT has been able to establish security hardware and software to allow this access/transmission.</td>
</tr>
<tr>
<td>use complex passwords</td>
<td></td>
</tr>
<tr>
<td>periodically change passwords</td>
<td></td>
</tr>
<tr>
<td>terminate passwords of separated employees</td>
<td></td>
</tr>
<tr>
<td>Automatic log off when system is idle</td>
<td>Use the internet security profiling tool Shields UP to test system’s security. However, further IT assessment may be necessary.</td>
</tr>
<tr>
<td>Multiple data links (security, authority to release)</td>
<td>Run antiviral software, even before downloading from hard storage devices.</td>
</tr>
<tr>
<td>Segregate PHI from non-PHI data</td>
<td>Validate any electronic method for transmission of ePHI from and to the registry.</td>
</tr>
<tr>
<td>Have a recovery plan and control all electronic PHI disposal for devices and media.</td>
<td>Do not send ePHI via campus email, ftp, or wireless applications.</td>
</tr>
</tbody>
</table>

- What if I am the systems manager of the database? A database owner has many responsibilities and detailed guidelines are under development. However, if you are also the systems manager of the repository, you will be responsible for mandatory security procedures such as auditing, monitoring and documentation activities.

- Management of Unique User ID and passwords for each user
- Data access control (tracking and monitoring access to your system)
- ePHI integrity and authentication activities
- ePHI encryption and data transmission (accounting for where information went from your system)
- Routine validation audits

- How do I get rid of PHI storage devices? Please remember that when you are upgrading or changing computer hardware, all your data still resides in the older computer. Once you copy the data file and transfer it to your new system, the old hard drive will need to be destroyed by one of the following methods:

  - Physically destroy the hard drive after it has been wiped clean of memory or reformatted, or
  - Run software specifically designed to wipe out hard drive memory, or
  - Reformat the older hard disk to remove all patient information (this is not necessarily a fool proof method).
**IMPORTANT NOTE:** When in doubt, always ask IT how to delete information from or how to destroy a hard drive or other device. The Medical Center has collection sites for PHI to be destroyed, and the Health Information Management Services (medical records) will also collect old devices with stored PHI.

• **What if I suspect there has been a breach of security?**
  
  o It is important to take action as soon as the security breach is suspected:

<table>
<thead>
<tr>
<th>Action</th>
<th>Contact Information</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report lost or stolen items to <strong>UCSF Police</strong> <em>(415) 476-1414</em></td>
<td>immediately.</td>
<td>Be prepared to answer questions on what type of identifiers stored on the device.</td>
</tr>
<tr>
<td>Report any concerns regarding system attacks by a virus, worm, hacking,</td>
<td><strong>ITS Customer Support</strong> <em>(415) 514-4100</em></td>
<td>(Option 1 for Medical Center, Option 2 for campus).</td>
</tr>
<tr>
<td>or compromised electronic devices immediately to the <strong>UCSF</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If a research system is involved, you must also notify the <strong>Committee on Human Research</strong> at <em>(415) 476 – 1814</em>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For more information refer to the <strong>HIPAA FAQ on security breaches for researchers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Flow charts of the procedures for processing the various types of security breaches will be updated and posted on <strong>UCSF’s Information Security website</strong>:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• <strong>Process for Lost or Stolen Devices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• <strong>Process for Compromised or Hacked Machines</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• <strong>Process for Lost or Stolen Hard Copies of Data with PHI</strong></td>
<td></td>
<td><strong>(anticipated available in June 2005)</strong></td>
</tr>
</tbody>
</table>

**IMPORTANT NOTE:** Remember, if you suspect that your system has been compromised or hacked, **stop** using the system until IT has cleared the machine.
<table>
<thead>
<tr>
<th><strong>INFORMATION SECURITY DO'S AND DON'TS</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO'S</strong></td>
<td><strong>DON'TS</strong></td>
</tr>
<tr>
<td><strong>SECURITY NEEDS AND ASSESSMENT</strong></td>
<td></td>
</tr>
<tr>
<td>Work with your local IT and department to determine the real security risks and the necessary protections for your system.</td>
<td>Do not assume system security based on its location or product/vendor security claims.</td>
</tr>
<tr>
<td><strong>SYSTEM PROTECTIONS</strong></td>
<td></td>
</tr>
<tr>
<td>Use firewalls supported by your IT group. Use antiviral protections at all times.</td>
<td>Do not operate systems without understanding limitations of security protections.</td>
</tr>
<tr>
<td><strong>SECURITY PLAN TO CONTROL ACCESS</strong></td>
<td></td>
</tr>
<tr>
<td>Develop and use a security plan to control the physical access to system and the electronic access to data.</td>
<td>Do not operate registry databases without a security plan.</td>
</tr>
<tr>
<td><strong>PHYSICAL ACCESS SECURITY</strong></td>
<td></td>
</tr>
<tr>
<td>Control access to the facilities housing database, workstations, and specimens using: ID cards, locked doors, sign in sheets.</td>
<td>Do not leave a database server or workstation accessible to non-authorized personnel.</td>
</tr>
<tr>
<td><strong>ELECTRONIC ACCESS SECURITY</strong></td>
<td></td>
</tr>
<tr>
<td>Password protect computers allowing access to only authorized personnel access. Terminate passwords of separated staff.</td>
<td>Do not leave workstation terminals open. Even in highly secured areas, unique user ID and a password provide audit trails.</td>
</tr>
<tr>
<td><strong>TRANSMISSION SECURITY</strong></td>
<td></td>
</tr>
<tr>
<td>Validate security of method (encryption) used for ePHI transmission. VPN is secure. Medical Center intranet is secure for email transmissions. Ensure all registry staff understand security policies. Web portals need approval.</td>
<td>Do not send ePHI in campus email as password protected attachments; floppies are not secure without encryption. If Medical Center email goes to the campus side, it is no longer secure. Wireless transmissions are not secure. See Secure Email solution: Campus.</td>
</tr>
<tr>
<td><strong>ACCESS TO PHI</strong></td>
<td></td>
</tr>
<tr>
<td>Limit PHI displayed on terminals. PHI should be sequestered from specimen inventory using study codes or accession numbers.</td>
<td>Do not make PHI readily available on the database.</td>
</tr>
<tr>
<td><strong>INTERNET CONNECTIVITY</strong></td>
<td></td>
</tr>
<tr>
<td>Not recommended.</td>
<td>Do not have internet, email, ftp, or wireless applications on the main registry terminal.</td>
</tr>
<tr>
<td><strong>RECOVERY PLAN</strong></td>
<td></td>
</tr>
<tr>
<td>Have a data recovery plan that includes validation and testing of all recovery processes.</td>
<td>Do not store backup data at the same physical site as the original database. Do not use untested backup media or devices.</td>
</tr>
<tr>
<td><strong>PHI DISPOSAL PLAN</strong></td>
<td></td>
</tr>
<tr>
<td>Establish procedures for disposing of PHI labels, electronic devices, media, and for reusing media.</td>
<td>Do not use trash bins for PHI disposal. All computer equipment must have the hard drives/memory erased.</td>
</tr>
</tbody>
</table>
VII. Sharing Biospecimens and Data with Other Researchers, Institutions or Private Companies

Section Summary: This section provides information for researchers who share specimens and/or associated data with other researcher within UCSF and entities outside the University system. Some suggestions on how to optimize specimen utilization through well planned collaborations and transfers are included.

- How are biospecimens shared within the UCSF system? Topics covered:
  - Evaluating research plans
  - Recouping costs
  - Disposition of unused specimens
  - Publications
  - Verification of IRB approval
  - Obtaining Consent to Share Biospecimens

- How are biospecimens shared with researchers outside the UCSF system? Topics covered:
  - Written agreements:
    - Material Transfer Agreements
    - Clinical Trial Agreements
    - Clinical Services Agreements
  - Financial concerns when transferring biospecimens outside UCSF
  - Protecting intellectual property (IP) rights

- What are the HIPAA privacy issues when sharing biospecimens for research?

How are biospecimens shared within the UCSF system? The University encourages collaborations between UCSF colleagues. The following topics should be considered before collaborations begin involving human specimens:

- Evaluating Research Plans
- Recouping Costs
- Disposition of Unused Specimens
- Verification of IRB Approval
- Obtaining Consent to Share Biospecimens
- **Evaluating Research Plans:** The following topics - considered by many specimen utilization review committees - may be useful whether you are preparing a specimen request or evaluating requests from potential collaborators:

<table>
<thead>
<tr>
<th>SCIENTIFIC MERIT</th>
<th>Is the research plan well designed and likely to provide meaningful results?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>It is very important to provide reviewers with a strong scientific rationale to justify use of specimens that are often a scarce resource. Justification should include reasons why established human cell lines and/or animals tissues cannot be used.</td>
</tr>
<tr>
<td></td>
<td>Applicants should thoughtfully consider the justification if requesting valuable or rare specimens, such as tumor specimens with 5+ years of follow-up data.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRIORITY</th>
<th>How does the request rank with those competing for similar specimens?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Many program banks give priority to researchers within the program.</td>
</tr>
<tr>
<td></td>
<td>Approval for a request for large numbers of valuable specimens (e.g. rare or limited resource, especially those with a large amount of correlative follow-up data), will be carefully considered if the request will deplete the resource.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STATISTICAL POWER</th>
<th>Is the number of specimens requested adequate to meet the stated aims?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The research plan should have adequate statistical power to achieve meaningful results.</td>
</tr>
<tr>
<td></td>
<td>This issue applies more to larger projects and less to pilot studies or efforts in assay develop.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATA REQUESTED</th>
<th>What kind of specimen-associated data is needed to achieve the stated goals?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>An applicant requesting 10 aliquots of tumor for assay development would not need to receive detailed demographic and follow up data with the specimens.</td>
</tr>
<tr>
<td></td>
<td>It would be appropriate to supply detailed demographic and follow up data to a researcher looking for prognostic markers for breast cancer recurrence.</td>
</tr>
</tbody>
</table>
**Recouping Costs:** Although UCSF banks and investigators are not allowed to sell specimens for profit, investigators involved in specimen banking are permitted to recover the costs within the UCSF re-charge system for expenses associated with collection, processing, storage, and distribution.

The table below, based on information provided by the Comprehensive Cancer Center at UCSF, shows many of the general activities to consider when estimating costs.

**IMPORTANT NOTE:** Your departmental manager or budget analyst may be able to provide financial guidance to help determine appropriate costs for staff-time and materials involved in specimen collection, storage, and distribution. Costs should be included in contract negotiations and grant proposals.

### Recovering Costs for Activities Involved in Handling Specimens

<table>
<thead>
<tr>
<th>Specimen Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Tracking of patients and operating/procedure schedules</td>
</tr>
<tr>
<td>• Coordination with collaborators/providers: OR, pathology, laboratory staff</td>
</tr>
<tr>
<td>• Specimen Sampling at Site of Collection:</td>
</tr>
<tr>
<td>• Examples:</td>
</tr>
<tr>
<td>For solid tumor specimens, multiple tissue samples (tumor, adjacent benign, nodes, and possibly normal) are prepared according to protocol</td>
</tr>
<tr>
<td>Fine Needle Aspirations (FNAs)</td>
</tr>
<tr>
<td>For whole blood specimens, isolation/fraction blood components</td>
</tr>
<tr>
<td>Documentation of signed consent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specimen Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Paraffin embedding of fixed tissues</td>
</tr>
<tr>
<td>• Preparation and staining of control slides for FNAs</td>
</tr>
<tr>
<td>• Preparation and staining of H&amp;E controls for all tissues to document QC on sampling and presence of tumor</td>
</tr>
<tr>
<td>• Trimming of blocks to maximize tumor volume</td>
</tr>
<tr>
<td>• Special tissue preparation for investigators, including thick sectioning, collodion bag preparation, cystospins, filter preparations, preparations for laser microdissection</td>
</tr>
<tr>
<td>• Maintenance of frozen and paraffin banks</td>
</tr>
<tr>
<td>• Pulling tissues and preparing for distribution</td>
</tr>
<tr>
<td>• Database maintenance of inventory, demographic and pathology data</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pathology Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Review of QC slides</td>
</tr>
<tr>
<td>• Review and marking of slides for trimming</td>
</tr>
<tr>
<td>• Selection of cases for specific studies in collaboration with investigators</td>
</tr>
<tr>
<td>• Retrieval of archival tissues from pathology tissue banks (formalin-fixed tissues) or banked frozen tissues</td>
</tr>
</tbody>
</table>

**Disposition of Unused Specimens:** Many established banks stipulate that unused portions of specimens be returned to the bank. Others specify that leftover portions of extracted DNA/RNA should be shared with other investigators. Researchers releasing specimens should consider what should be done with any remaining portions of specimens and come to an agreement with the requestor prior to release of the specimens.
Publications: Requestors should agree to acknowledge the repository or bank as the specimen source in all publications, abstracts, and presentations that result from research using the specimens. The option of co-authorship may be appropriate if the bank provides scientific input.

- **Verification of IRB Approval**: Anyone who plans to share specimens with other researchers should have a plan for verifying that the requestors have obtained approval from the Committee on Human Research, UCSF’s Institutional Review Board.

**IMPORTANT NOTE**: Sharing specimens with researchers outside the UCSF system is discussed in detail elsewhere. Verification should be obtained from the applicant that the protocol has approval from the appropriate institutional review board.

- **Obtaining Consent to Share Biospecimens**: The consent form used to obtain specimens should inform participants that their specimens will be shared and with whom. For information on obtaining consent and suggested standard wording, refer to the CHR consent guidelines.

- **How are biospecimens shared with researchers outside the UCSF system?** A written agreement, executed by the Office of Sponsored Research, is required before human biospecimens collected at UCSF can be shared with researchers outside the UCSF system.

  The Office of Sponsored Research assists researchers by carefully negotiating and executing contractual agreements with academic institutions, non-profit organizations, and industry to ensure the University’s and the researcher’s financial concerns and intellectual property rights are protected.

- **Written agreements** pertinent to sharing human biospecimens with outside entities include:
  - **Material Transfer Agreements (MTA)** are required to transfer any research material, including human biospecimens, from UCSF to researchers outside UCSF (termed an outgoing MTA).
    - MTAs are negotiated and executed by the Industry Contracts Division of the Office of Sponsored Research.
    - All MTAs (incoming and outgoing) are reviewed by OSR regardless of funding source.
    - The MTA process is initiated by completing an MTA Request Form
  - **Clinical Trial Agreements** are required to conduct a clinical trial with an outside entity. The provisions for collecting and transferring human biospecimens that are part of a clinical trial would be described in the Clinical Trial Agreement.
Clinical Trial Agreements with industry are handled by the Industry Contracts Division of the Office of Sponsored Research.

Clinical Trial Agreements with government agencies or other academic institutions are handled by the Contracts and Grants Division of the Office of Sponsored Research.

Clinical Services Agreements are required for a UCSF researcher or department to provide a service in support of a clinical trial. Clinical Services Agreements with industry are handled by the Industry Contracts Division of the Office of Sponsored Research.

Clinical Services Agreements with government agencies or other academic institutions are handled by the Contracts and Grants Division of the Office of Sponsored Research.

Financial concerns when transferring biospecimens outside UCSF: Although specimens cannot be sold, investigators can recover time and material costs associated with obtaining, processing, shipping, and tracking samples. It is important that researchers include these costs in contract negotiations and grant proposals, as well as for cost recovery in the UCSF recharge system (see below).

Your departmental manager or budget analyst may be able to provide financial guidance to help determine appropriate costs for staff-time and materials involved in specimen collection, storage, and distribution.

The cost recovery information provided elsewhere may be useful.

External revenue of recharge activities [UCSF Recharge Policy (Att4) 05/17/02]:

Recharge Activity may charge a rate in excess of full direct plus indirect costs to one or more external users.

The surplus revenue above the direct and indirect costs generally must be transferred out of the Recharge Activity's operating fund to a reserve fund at least annually. Such surplus revenue may be used in any manner that supports the Recharge Activity, including subsidies to lower costs charged to other users, paying for unallowable costs, purchasing equipment, or expanding the Recharge Activity.

If the surplus revenue is used to subsidize allowable costs, it may be retained and utilized within the Recharge Activity’s operating fund.

Protecting intellectual property (IP) rights: Researchers should be aware of the UCSF patent policy to ensure IP rights are protected in collaborative research projects involving human biospecimens. However, the UCSF Patent Policy is only one of a number of UC policies that address intellectual property. The best way to protect IP rights when transferring human specimens to another institution is for the investigator to contact the Industry Contracts Division of the Office of Sponsored Research and it will negotiate a specimen transfer agreement with the appropriate IP terms (as well as other terms that are important to the University).
What are the HIPAA privacy issues when sharing biospecimens for research? The type and extent of private information that can be transferred with shared specimens must be consistent with your CHR-approved research protocol, data use agreements, and, if applicable, Clinical Trial Agreements.

• Investigators are asked to address HIPAA privacy issues applicable to their research throughout the CHR application process. For example, investigators must describe the type of information that will be created, used, and distributed as part of the study, as well as the safeguards that will be implemented to protect the PHI from inappropriate disclosure. Although each study will be reviewed individually, the CHR generally recommends the following:

  o Investigators should only supply the minimum amount of health information to meet research objectives.
  
  ➢ Identifiers cannot be associated with samples provided to entities outside UCSF for basic research studies using human specimens. This includes but is not limited to all written, electronic, and oral formats.
  
  ➢ Only limited PHI should be associated with specimens collected at UCSF and sent elsewhere as part of clinical trials. The specimens should be coded and direct identifiers (name, medical record number, or social security number) must not be associated with specimens.

• HIPAA compliance must be maintained throughout the research study while sending and receiving all specimen and/or data formats, including:

  o Physical media such as paper, disks, images, CD ROMs, DVDs, memory sticks, computers, laptops, and portable devices; and

VIII. Using Human Stem Cell Lines
This section is under construction. Current policies and procedures are described on the UCSF Stem Cell homepage.

IX. A Brochure for Prospective Tissue Donors
Donating Tissue for Research:
## Appendix A: Terms and Definitions Categories of Human Biospecimen Information

### Terms Used for Repository Specimens

**Unidentified Specimens**
- No identifiable personal information was collected or,
- if PHI was collected, it was not maintained and cannot be retrieved by the repository.
- No PHI is associated with specimen.

**Identified Specimens**
- Specimens are linked to personal information allowing identification of donor/subject.
- Identifiers (PHI) may include name, patient number, or clear pedigree location (subject’s relationship to family member whose identity is known).

### Terms for Samples Used by Researchers

**Unidentified Samples**
- Supplied by repository to researcher from a collection of unidentified specimens
- Sometimes termed “anonymous”

**Coded Samples**
- Supplied from identified specimens
- Identifiers are replaced with a code - a number, letter, symbol or combination – before distribution to researchers
- Samples may be considered “de-linked” if key to decipher code is fire-wall protected
- Researchers agree in writing to never pursue access to the code key. There are IRB-approved written policies and procedures prohibiting release of identifiers

**Unlinked Samples**
- Stripped of identifiers
- Samples can not be linked to an identified specimen/person

**Identified Samples**
- Supplied with identifiers (such as name or patient number)
- Identifiers would allow researcher to identify subject/donor
### SPECIMEN BANKING SPACE: POINTS TO CONSIDER

- Is the overall space sufficient for housing storage equipment?

- Can the height and depth of each storage unit fit in the space?

- Is there clearance for opening and closing doors and for safe entry and exit.

- Is there adequate ventilation to handle heat generated by equipment?

- Is there sufficient clearance at doors and hallways for delivery of the storage equipment.

- Is space sufficient for operations: receiving, processing, storing, transferring specimens, cleaning storage unit, and data entry.
## SPECIMEN BANKING EQUIPMENT: POINTS TO CONSIDER

### Ultra-low Temperature Freezers:

- The range of sample types and what samples will be used for. Some specimens can be highly sensitive to temperature fluctuations.

- How frequently will the freezers be opened and closed?

- Upright versus chest freezers: Upright units are more space economical than chest freezers, but chest freezers can maintain ultra low temperature longer. Power fluctuations can be a problem with temperature variance for types.

- Voltage requirements – 110 or 208,

- Temperature recorder type, voltage regulator – optional or standard?

- Seismic issues - Does the unit have locking wheels? Units must be secured to wall.

- Extended warranty available on compressors-make sure it covers labor and parts

- Alarm systems for freezers are a necessity. Need local and remote alarm system to contact staff 24 x 7 in the event of equipment or power failure. Local alarms are only good if people are present in the laboratory. Will they work in a power loss situation?

- Plan at least 5 years out for equipment replacement or repairs. You must calculate this into your budget in order to protect the collections.

### Liquid Nitrogen Units:

- Size of unit – number of vials a unit will hold

- Weight of a full rack – a completely filled rack if it had to be lifted out of the freezer may weight 30-50 pounds or more.

- Alarm system that is programmable. This will warn you that the liquid nitrogen level is low in your freezer or your source of liquid nitrogen needs to be replenished. Otherwise, someone must check the levels daily.

- Automatic refill system for liquid nitrogen: – note the smaller units are manually fed but automatic systems can fail to refill tanks.

- Racking and inventory system – metal boxes are best with a lid.

- Liquid nitrogen freezers should be in an open area, not in a confined space

- Face shields, safety goggles, and cryogenic gloves must be available for lab personnel.

- Protective floor matting: Liquid nitrogen is so cold that it will shatter/crack your vinyl flooring.

- Seismic issues - Does the unit have locking wheels? Units must be secured to wall. Are source canisters tied down? Check with EH&S.

- Electrical requirements: for the units that have alarms or other sensors
## Specimen Storage and Labeling: Points to Consider

### Specimen Storage

**Freezer storage system:** Racks and cryo boxes suitable for individual storage containers: Do you want to store 96 well plates, 2 ml, 5 ml cryovials, or 15 ml, 50 ml conical tubes? Liquid nitrogen racks vs canes, plates, vials, dishes, and tubes?

**Safe specimen distribution:** Ideally if there is a large amount of freezer space and floor space, each specimen should be distributed in different freezers to prevent loss of all specimens from one subject. Without this luxury a scanning alarm system is required to inform staff of equipment failure and/or electrical power outages.

### Specimen Labeling

**Label type:** Use only labels specifically designed for liquid nitrogen and ultra-low temperature storage because general-use labels will detach when exposed to ultra-low temperatures. Do not use scotch tape.

**Computer labels:** Consider labeling by computer and not by hand. This eliminates the problem with poor handwriting styles and limited space on the label. Proper inventory systems should have a labeling program to prevent hand labeling of cryovials.

**Bar coding:** Thermal transfer labels are resistant to many chemicals and are durable in both hot water baths and liquid nitrogen freezes. Some manufactures/suppliers are: Brady, Zebra (Eltron), Shamrock, and Intermec. You need a thermal transfer printer to use these labels.

**Labeling pen:** Pencil will smear over time, some inks actually smear or bleed when exposed to liquid nitrogen or ice. Test all markers before using them in your specimen bank.
**Appendix E: Emergency and Backup Plans: Points to Consider**

<table>
<thead>
<tr>
<th><strong>EMERGENCY AND BACKUP PLANS: POINTS TO CONSIDER</strong></th>
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<tbody>
<tr>
<td><strong>Electrical backups:</strong> If your laboratory experiences a loss of electrical power, does your facility have an electrical generator? If not, what are your plans in the event there is no power for more than 24 hours?</td>
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<tr>
<td><strong>Backup freezer:</strong> If you will have a large specimen bank, then include in your budget at least one empty freezer as a backup in the event of a unit malfunction.</td>
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<tr>
<td><strong>Backup freezer loaners:</strong> know what is available for backup freezers, such as ultra low freezer rentals. Check out available sizes and rental requirements such as recharge account before an emergency occurs.</td>
</tr>
<tr>
<td><strong>Liquid nitrogen backup:</strong> Can the vendor deliver on short notice? Does the campus have a reserve supply for emergencies that you could use? Who can you either borrow a container from or who has extra space for you to temporarily store your samples? Extra canisters are rare at UCSF.</td>
</tr>
<tr>
<td><strong>Dry ice availability:</strong> Who supplies it and how often? Can you get an emergency delivery? Who can you borrow dry ice from at UCSF? In some emergencies, UCSF will provide a large stock of dry ice for campus.</td>
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Appendix F-1: UCSF AIDS Specimen Bank Flow Chart - Specimen Processing and Storage

UCSF AIDS Specimen Bank (ASB) - Specimen Processing & Storage Flow Chart

ASB Contacted for Repository Services

- Depositor submits CHR approved protocol to ASB
- Study Protocols are reviewed.
- Study Site and ASB Coordinate Delivery of Specimens

ASB Reviews
1. IRB approved protocol
2. Specimen banking is part of IRB approved protocol
3. Consent Forms - Patients are informed of disposition of specimens
4. Specimen processing protocol is reviewed
5. Budget is approved by ASB and client.

- Specimen Packaged for Delivery by Standardized Protocol
- ASB Receives Specimen from Study Site
- Specimen Information Entered into Database
- Specimens Processed by Study Protocol

- Paraffin-Embedded Slides stored at Room Temperature
- Specimen inventoried into Storage and Entered into Database

ASB Quality Assurance of Specimens

- Check/Verify Protocols & Procedures
  1. Packaging
  2. Storage Conditions
  3. Patient ID
  4. Specimen Match

Finish/ Verify Protocols & Procedures Failure
- Study Site Notified of Protocols & Procedures Failure

ASB

- NO
- YES

SpecimenInventory

- Specimen stored in Ultra-low Freezer

- Specimen stored in Liquid Nitrogen

END

UCSF Biospecimen Guide_May05 (links on document updated 7/2010)
Appendix F-2: UCSF AIDS Specimen Bank Flow Chart - Specimen Withdrawal

UCSF AIDS Specimen Bank (ASB) - Specimen Withdrawal Flow Chart

ASB Contacted for Specimen Withdrawal

Requestor submits Proposal to ASB

ASB Contacts Depositor for Permission to Release Specimens

Requestor and ASB Coordinate Delivery of Specimens

Specimen Packaged for Delivery as Diagnostic or Dangerous Goods by Certified Staff

Specimens sent out are logged into ASB database.

Recipient is contacted by email or phone to expect delivery of specimens.

All shipments are tracked by ASB staff.

Shipment Arrives in Good Condition

END

ASB Reviews
1. IRB approved protocol is reviewed.
2. ASB seeks permission from ASB Depositor(s) for release of specimens.
3. ASB reviews database for specimen selection.
4. All shipping and contact information is provided.
5. If requestor is not part of a study, then a budget is submitted for labor and shipping charges.

ASB Contacts Requestor to inform them that there are no specimens that match their criteria, depositor is unwilling to collaborate, or IRB approved protocol does not include testing of requested specimens.

NO

ASB notified of shipment problems. Will send replacement specimens if available.

NO

Note: ASB does not accept any specimen returns after the vial has been opened.

YES

YES
Appendix G-1: UCSF Cancer Center Tissue Core Flow Chart - Specimen Collection

UCSF COMPREHENSIVE CANCER CENTER
SPECIMEN COLLECTION MODEL

- Tissue donors are protocol-defined.
- All protocols must be approved by the CHR.

Identify potential tissue donor

Consent form signed by donor?

NO

STOP!
Specimen cannot be donated without written consent signed by the donor

YES

Collect tissue from:
- Operating Room
- Pathology
- Clinic

Prepare samples from tissue specimen according to CHR-approved tissue banking protocol

Prior arrangements must be made with surgeons and staff responsible for collecting specimens

Frozen Samples
- OCT Embedded
- Labeled
- Stored in liquid nitrogen or -80°C

Formalin-Fixed Samples
- Paraffin-Embedded
- Labeled
- Stored at room temperature in files

Log samples into database for inventory tracking

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