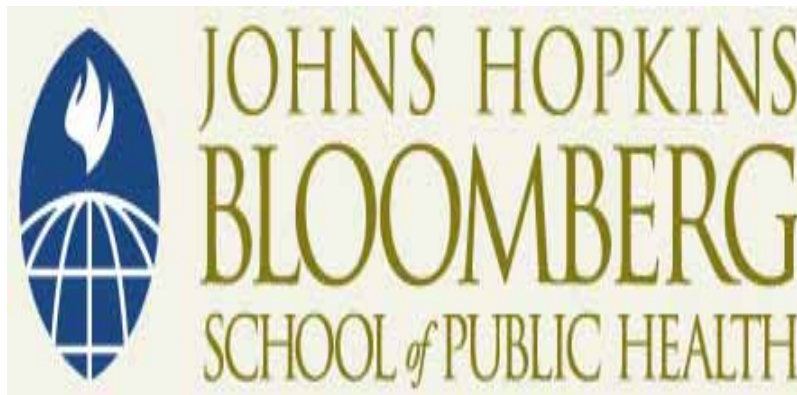


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Epidemiology 340.715

Problems in the Design of Epidemiologic Studies

David Celentano, ScD
Course Director

Fourth Term, 2006
MWF 1:30-3:50 PM
W3030

General Information

Course Description

Epidemiology 340.715 Problems in the Design of Epidemiologic Studies (6 Units) Fourth Term.

This course is designed to provide students with an understanding of the methodologic and logistic problems involved in designing and conducting epidemiologic studies. Students, will prepare a research protocol for study in a human population using the PHS form 398 developed by The National Institutes of Health. The course also offers students opportunities to critically evaluate the adequacy and scientific merit of research protocols, and to develop an appreciation of the ethical aspects of conducting research involving humans. This course is planned as a final sequence in a series of epidemiologic methods courses (Epidemiology 340.601-604) and offers students the opportunity to apply methods and principles learned in earlier and current courses to specific epidemiologic problems.

Course Proposal Format & Assembly Instructions

NIH Grant Application Format

- ▶ PHS Forms are available on-line:
<http://grants.nih.gov/grants/funding/phs398/phs398.html>
- ▶ Use Arial, Helvetica, Palatino, Linotype, or Georgia typeface and a font size of 11 points or larger.
- ▶ Original (signed by principal investigator and an authorized organizational official) and five exact, legible, single-sided photocopies.
- ▶ CD-ROM with proposal (without appendices should be submitted).
- ▶ Paper size: standard 8 ½ x 11 inches only. Paper grade that will go through photocopy machine: 20lb. Weight (no tissue or cardboard).
- ▶ Print the name of the P.I. on every page.
- ▶ Number all pages consecutively. No suffixes such as 5a, 5b, etc...
- ▶ Order NIH grant application by designated page number, beginning with the cover sheet/face page as page 1 and continuing throughout the end of proposal (excluding appendices).

- ▶ **Should they be deemed essential to an evaluation of the application, supplementary background graphs, diagrams, tables and charts may be submitted as appendices.**
- ▶ **No page numbering necessary for the Appendix. Provide five legible, collated sets of appendices (see below).**

Proposal Assembly Instructions

- ▶ **Bind grant application (excluding Appendix) with one binder clip. Do not attach individual pages with paper clips, staples, etc. Nothing pasted nor scotch-taped to pages.**
- ▶ **Order parts of grant application (excluding Appendix) as follows:**
- ▶ **Proposal to be submitted must be enclosed in an envelope, containing the grant application and Appendix, if any.**
- ▶ **Include four collated sets of all Appendix material and the certificate of CHR training. Identify each of the sets with the name of Epidemiology 340.715. Problems in the Design of Epidemiologic Studies 2005, the Principal Investigator and the proposed title.**
- ▶ **Don't forget to retain one copy.**

Session 1 and 2

March 27, 2006

COURSE OUTLINE:

Part I: Introduction

- A. Course Overview**
- B. Group Organization**
- C. Review of the Website**

Part II: Principles of Research Design

Part III: Sources of Research Support

- A. PHS/NIH**
- B. PHS Form 398**
- C. RO1, RFA, RFP, PA and other research jargon**
- D. Private Foundations**

Course Outline

- I. Introduction**
 - Course Overview**

- II. Principles of Research Design**

- III. Sources of Research Support**

- IV. Parts of the NIH Grant Application Form PHS 398**
 - A. The Abstract**

 - B. The Research Plan**
 - 1. Specific Aims**
 - 2. Background and Significance**
 - 3. Preliminary Studies/Progress Report**
 - 4. Research Design and Methods**
 - 5. Human Subjects**
 - 6. Vertebrate Animals**
 - 7. Literature Cited**
 - 8. Consortium / Contractual Arrangements**
 - 9. Resource Sharing**
 - 10. Consultants**

C. Administrative and Financial Information

1. Face Page

2. Description and Personnel

3. Table of Contents / Performance Sites

4. Budget and Budget Justification

**a. Detailed Budget for Initial Budget
Period**

**b. Detailed Budget for Entire Budget
Period**

**c. Budgets Pertaining to Consortium/
Contractual Arrangements**

5. Biographical Sketches

6. Resources

D. Appendix

V. Grantsmanship and Introduction to Peer Review Process

VI. Developing the Grant Application

A. Planning the Research Protocol

B. Writing the Research Protocol

C. Completing the Research Protocol

D. Reviews and Re-submission

VII. Peer Review of Proposals

A. Study Section

B. Conflict of Interest

C. Summary Statements

D. Advisory Committee and Funding Decisions

VIII. Course Review

IX. Course Evaluation

Glossary

This glossary defines terms and phrases most commonly used in the award and administration of NIH grants.

• **Application** — A formal request for financial assistance for a project/activity submitted to NIH on the appropriate application form:

– Form PHS 398, except as shown in the table below, is used for all new competing applications (Type 1) or competing continuation applications (Type 2). This same form is used for a competing supplemental application (Type 3) when requesting additional funds for a change of scope or expansion to meet the needs of a project.

– Most of the competing application forms have corresponding forms to be used when applying for non-competing continuation support during an approved competitive segment. The form corresponding to PHS 398 is Form PHS 2590. Some of these forms may be accessed from one of the following web sites:

(<http://www.nih.gov/grants/forms.htm>) and
(<http://www.nih.gov/grants/oer.htm>).

APPLICATION FORMS USE FORM NUMBER

Small Business Innovation Research Program—Phase I.....	PHS 6246-1
Small Business Innovation Research Program—Phase II	PHS 6246-2
Small Business Technology Transfer Program—Phase I	PHS 6246-3
Small Business Technology Transfer Program—Phase II.....	PHS 6246-4
Individual National Research Service Award or Senior International Fellowship Award	PHS 416-1
Health Services Project.....	PHS 5161-1
Construction Grant.....	PHS 424

- **Assistance** — The award of money, property, services, or anything of value to a recipient to support or stimulate a public purpose authorized by Federal statute. Assistance relationships are expressed in less detail than are acquisition relationships, and responsibilities for ensuring performance rest largely with the recipient or are shared with the NCI.
- **Award** — The provision of funds by NCI, based on an approved application and budget, to an organization or an individual to carry out an activity or project.
- **Budget** — A categorical or non-categorical request for funds required to support the proposed activity.
- **Budget Period** — The interval of time (usually 12 months) into which the grant project period is divided for funding and reporting purposes.
- ***Catalog of Federal Domestic Assistance (CFDA)*** — (<http://12.46.245.173/cfda/cfda.html>)

The CFDA is a government-wide compendium of Federal programs and activities that provides assistance or benefits to State and local governments; public, quasi-public, profit, and nonprofit institutions; and specialized groups and individuals. The catalog is compiled and published annually by the General Services Administration.

- **Competitive Segment** — The initial project period recommended for support (usually one to five years) or each extension of the prior project resulting from the award of a competing continuation grant.
- **Consortium Agreement** — A collaborative arrangement in support of a research project in which some portion of the programmatic activity is carried out through a formalized agreement between the grantee and one or more other organizations that are separate legal entities administratively independent of the grantee.
- **Contract (R&D)** — An instrument used by NCI to procure cancer research services and other resources needed by the Federal Government. Contracts are legally binding documents and used when the principal purpose of the transaction is to acquire a specific service or end product for the direct benefit of, or use by, the NCI.
- **Contract (under a grant)** — A written agreement between a grantee and a third party to acquire routine goods or services.
- **Cooperative Agreement** — An award instrument reflecting an assistance relationship between the NCI and a recipient in which substantial NCI programmatic involvement is anticipated during performance of the activity.
- **Direct Costs** — Costs that can be specifically identified with a particular activity or project.

- **Expedited Board Concurrence and Early Award Initiative** — This NCI initiative focuses on that part of the grant review and award cycle in which NCI has the most influence, the award negotiation and issuance, which accounts for two months of the 10-12 month grant review and award process.
- **Facilities and Administrative (F&A) Costs** — Costs (previously known as indirect costs) that are incurred by a grantee for common or joint objectives and which, therefore, cannot be identified specifically with a particular project or program.
- ***Federal Register*** —
(http://www.access.gpo.gov/su_docs/aces/aces140.html)
An official daily publication that provides a uniform system for communicating proposed and final regulations and legal notices issued by Federal agencies, including announcements of the availability of funds for financial assistance programs. The Code of Federal Regulations is an annually-revised codification of the general and permanent rules published in the Federal Register.

- **Financial Status Report (FSR)** — A financial report due no later than 90 days after the end of each budget period or, for grants in the SNAP population, excluding those awards to Federal institutions or foreign organizations, no later than 90 days after the end of each competitive segment. The FSR shows the status of awarded funds for the competitive segment as maintained in the official accounting records of the grantee institution. Grantees are required to submit FSRs for continued funding of their grant(s).
- **Grant** — A financial assistance mechanism providing money, property, or both to an eligible entity to carry out an approved project or activity. Performance responsibility rests primarily with the recipient and there is little or no Federal involvement or participation in the performance of activities.
- **Grantee** — The organization or individual awarded a grant or cooperative agreement by NCI that assumes legal, financial, and scientific responsibility and accountability both for the awarded funds and for the performance of the grant-supported activity. A grantee organization can be public or private, nonprofit or for-profit, educational institution, hospital, corporation, domestic or foreign agency, or other legally accountable entity.
- **Grants Management Officer (GMO)** — The individual designated by an awarding component to be responsible for ensuring that both the granting agency and grantees meet all requirements of laws, regulations, and formally established policies.

- **Grants Management Specialist** — An individual selected by the Grants Management Officer to serve as the focal point of the awarding component for all business/management activities associated with the negotiation, award, and administration of a grant or cooperative agreement. He/she also interprets grant administration policy and provisions.
- **Indirect Costs** — See Facilities and Administrative (F&A) Costs.
- **Institute/Center (IC)** — The NIH organizational component responsible for a particular grant program(s) or set of activities. NCI is an IC.
- **Initial Review Group (IRG)** — A group of study sections or peer review committees that are arrayed by scientific discipline. Study sections or peer review committees of scientists advise on the scientific and technical merit of research applications submitted for support.
- **Institutional Animal Care and Use Committee (IACUC)** — A committee set up by an institution to review at least once every six months the institution's program for humane care and use of animals. The IACUC reviews research protocols involving the care and use of animals at the institution and makes recommendations to the Institutional Official regarding any aspect of the institution's animal program, facilities, or personnel training.

- **Institutional Review Board (IRB)** — A board or committee set up by a research institution to ensure the protection of rights and welfare of human research subjects participating in research conducted under its auspices. The IRB makes an independent determination to approve, require modifications in, or disapprove research protocols based on whether human subjects are adequately protected, as required by federal regulations and local institutional policy.
- **Modular Grants** — An initiative that expands the existing reinvention initiatives that are designed to concentrate the focus of investigators, their respective institutions, peer reviewers, and NIH staff on the science NIH supports rather than on the details of budgets. Under modular budget proposals, applicants are instructed to prepare the budget request in direct cost modules of \$25,000 up to a maximum direct cost level of \$250,000. (Budget requests beyond this level follow traditional application instructions.) This process eliminates the need for much of the budget detail, thereby relieving administrative burdens on both NIH staff and grantee organizations and simplifying cost management for NIH program staff.
- **Monitoring** — A process whereby the programmatic and business management performance aspects of a grant are reviewed by assessing information gathered from various required reports, audits, site visits, and other sources.

- **Notice of Grant Award** — The legally binding document that notifies the grantee and others that an award has been made. This document contains or references all terms and conditions of the award, and documents the obligation of Federal funds. The award notice may be in letter format and may be issued electronically.
- **Peer Review** — (42 CFR Part 52h) A system of review of research applications that utilizes reviewers who are the professional peers of the principal investigator responsible for directing or conducting the proposed project.
- **Percentile Score** — A score that represents the relative position or rank of each priority score among the scores assigned by that particular study section at its last three meetings. The lower the numerical value of the percentile score, the better. The range is from .1 to 99.9.
- **Preapplication** — A statement in summary form of the intent of the applicant to request funds. Preapplications are requested for all construction projects for which the need for Federal funding exists. It is used to determine the applicant's eligibility; determine how well the proposed project can compete with other similar applications; and eliminate any proposals for which there is little or no chance for funding before applicants incur significant expenditures for preparing an application.

- **Principal Investigator (PI)** — An individual designated by the recipient organization to direct the project or activity being supported by the grant. He or she is responsible and accountable to recipient organization officials for the proper conduct of the project or program. The organization is, in turn, legally responsible and accountable to NCI for the performance and financial aspects of the grant-supported activity.
- **Prior Approval** — Written approval from NCI's Grants Management Officer required for specified postaward changes in the approved project or budget. Such approval must be obtained prior to undertaking the proposed activity or spending NCI funds.
- **Priority Score** — The score determined by averaging the individual ratings given by each voting member of the IRG. Each IRG member assigns to the application a numerical rating that ranges from 1.0 (outstanding) to 5.0 (acceptable) that reflects his/her opinion of the scientific merit of the application. A composite score is then expressed on a scale of 100 to 499.
- **Procurement** — The acquisition by purchase, lease, or barter of property or service for the direct benefit or use of the NCI or other Government agency. The procurement instrument most often used is a contract. A contract details the rights, duties, and obligations of each of the parties involved.

- **Program Announcement (PA)** — A formal statement that describes and gives notice to the grantee community of the existence of an NIH-wide or individual Institute/Center extramural research activity/interest or announces the initiation of a new or modified activity/interest or mechanism of support and invites applications for grant or cooperative agreement support. NCI uses RFAs to announce cooperative agreements. PAs are published in the NIH Guide for Grants and Contracts (<http://www.nih.gov/grants/guide/index.html>). Funds may or may not be set-aside for PAs.
- **Program Official** — The NCI official responsible for the programmatic, scientific and/or technical oversight and monitoring of a grant. The program official works closely with grants management staff.
- **Project Period** — The total time for which support of a discretionary project has been programmatically approved. A project period may consist of one or more budget periods. The total project period is comprised of the initial competitive segment and extensions.
- **Recipient** — The organizational entity or individual receiving a grant or cooperative agreement. See Grantee.

- **Recommended Levels of Future Support** — The funding level recommended for each of the future years approved by the IRG and the NCAB. These amounts are subject to availability of funds each year and evaluation of the scientific progress of the project. In addition, the recommended funding level may be subject to correction of arithmetic errors and to adjustments made in accordance with applicable grant policies, as appropriate.
- **Request for Application (RFA)** — A formal announcement that invites grant or cooperative agreement applications in a well-defined scientific area to support specific program initiatives, indicating the amount of funds set aside for the competition and the estimated number of awards to be made. RFAs are published in the NIH Guide for Grants and Contracts (<http://www.nih.gov/grants/guide/index.html>).
- **Research Project Grant (RPG)** — Award for an investigator-initiated research proposal.
- **Scientific Review Administrator (SRA)** — A Federal scientist who presides over an Initial Review Group and is responsible for coordinating and reporting the review of each application assigned to his/her committee, thereby serving as an intermediary between the applicant institution and the reviewers of the application. The SRA prepares a summary statement for each application reviewed by his/her IRG.

- **Small Business** — A business, including its affiliates, that is independently owned and operated and not dominant in its field of operation; has its principal place of business in the United States and is organized for profit; is at least 51 percent owned, or in the case of a publicly owned business, at least 51 percent of its voting stock is owned by U.S. citizens or lawfully admitted permanent resident aliens; has no more than 500 employees; and meets other regulatory requirements established by the Small Business Administration at 13 CFR Part 121.

- **Stipend** — A payment made to an individual under a fellowship or training grant in accordance with pre-established levels to provide for the individual's living expenses during the period of training. A stipend is not considered compensation for the services expected of an employee.

- **Streamlined Non-Competing Award Process (SNAP)**

— A streamlined process that eliminated two of the financial documents that were part of the non-competing application: a categorical budget for the next budget period and an estimated report of expenditures for the current budget period. Under SNAP, the GMO negotiates the direct costs for the entire competitive segment at the time of the competing award or, in the case of modular awards, determines the applicable number of modules for each

budget period within the competitive segment. This eliminates the need for annual budget submissions and negotiations, if applicable, and reduces the information NIH requires to review and approve noncompeting continuation applications and to monitor these awards. As a result, for awards under SNAP, grantees are required to submit only limited portions of the PHS-2590, including an annual progress report. As part of the progress report, grantees must answer questions pertaining to other support, unobligated balances, and change in the level of effort of key personnel. If there is a change in performance site and/or if there is anticipated program income, grantees also must submit the PHS-2590 checklist and, if program income is anticipated, must include the estimated amount and source of the income. Grantees (other than foreign grantees and Federal institutions) also are required to submit a quarterly Federal Cash Transactions Report (FCTR) (SF-272) to the Payment Management System (PMS). For awards under SNAP (other than awards to foreign organizations or Federal institutions), a Financial Status Report (FSR) is required only at the end of a competitive segment rather than annually. This FSR must be submitted within 90 days after the end of the competitive segment and must report on the cumulative support awarded for the entire segment. An FSR must be submitted at this time whether or not a competing continuation award is made. If no further award is made, this report will serve as ~~the~~ the final FSR

- **Study Section**—The component part of an Initial Review Group that advises on the scientific and technical merit of research applications.
- **Substantial Foreign Component**—Under a grant to a domestic institution, the performance of any significant element or segment of the project outside of the United States, either by the grantee or by a researcher employed by a foreign institution, with or without grant funds.
- **Success Rate**—The number of funded applications divided by the number of applications reviewed by Initial Review Groups.
- **Technical Assistance Review**—An evaluation by NCI grants management staff to assess an institution’s business and financial management systems to ensure that applicable regulations and policies are being followed.
- **Terms and Conditions of Award** — All legal requirements imposed on a grant, whether based on statute, regulation, policy, other referenced document, or the grant award document itself. The Notice of Grant Award may include both standard and special provisions that are considered necessary to attain the grant’s objectives, facilitate postaward administration of the grant, conserve grant funds, or otherwise protect the interests of the Federal Government.

- **Total Project Costs** — The total allowable costs (both direct costs and facilities and administrative costs) incurred by the grantee to carry out a grant-supported project or activity. Total project costs include costs charged to the NCI grant and costs borne by the grantee to satisfy a matching or cost-sharing requirement.

<http://www3.cancer.gov/admin/gab/2005GPB/GPB05-HighRes.pdf>

Research Design and Methods

- ▶ **Some generic sections**
 - **overview**
 - **population selection**
 - **data collection**
 - **data management**
 - **quality assurance/quality control**
 - **project administration**
 - **data analysis**
 - **limitations**

- ▶ **Overview section**
 - **what design and why**
 - **what population and why**
 - **what will be done**
 - **how will it be done**
 - **what is the schedule**

- ▶ **Key elements**
 - **study design**
 - **location**
 - **schedule**

Case-Control Studies

- ▶ **Population selection**
 - how is the population defined
- ▶ **Case selection**
 - criteria
 - ascertainment mechanism
 - recruitment mechanism
- ▶ **Control selection**
 - rationale
 - criteria
 - ascertainment mechanism
 - recruitment mechanism

Cohort Studies

- ▶ **Subject Selection**
 - criteria
 - exposure classification
- ▶ **Exposure Assessment**
 - fixed exposures
 - time-dependent exposures
- ▶ **Subject Follow-Up**
 - follow-up strategy
 - tracking losses to follow-up

Limitations

▶ Bias

- **selection bias**
 - potential sources and consequences
- **information bias**
 - how minimize
 - validation studies
 - adjustment methods
- **confounding**
 - potential confounders
 - strategies for addressing (restriction, matching, stratification and modeling)

▶ **Power**

- **assumptions**
- **adequacy of power**
- **consequences of error**

▶ **External validity**

- **barriers to generalizability**

▶ **Feasibility**

- **population identification**
- **data collection**
- **costs**
- **alternative approaches**

QA/QC

- ▶ **Data collection procedures**
 - **standardized protocols**
 - **standardized training**
 - **standardized review**
 - **supervisor edit**
 - **PI review**
- ▶ **Laboratory protocols**
 - **GLP**
 - **QA/QC**
- ▶ **Data management**
 - **entry and edit procedures**
 - **audit trails**

- ▶ **Project management**
- ▶ **Analyses**
 - **analytic plan**
 - **review of analytic code**
 - **documentation of results**

Data Analysis

- ▶ **Data description**
 - **participants vs non-participants**
- ▶ **Analytic strategy**
- ▶ **Simple measures of association**
- ▶ **Modeling approaches**
- ▶ **Controlling for confounding**
- ▶ **Statistical software**

Data Management

- ▶ **Hard copy**
 - handling paper
 - tracking
- ▶ **Data management hardware and software**
- ▶ **Documentation**
- ▶ **Security**
- ▶ **Archiving**

Project Management

- ▶ **Management structure**
 - organizational structure
 - roles
- ▶ **Project tracking**
 - reporting
- ▶ **Project communications**
 - staff meetings
- ▶ **Advisory committees**
 - internal
 - external

Gender and Minority Inclusion

- ▶ **Composition of proposed study group**
- ▶ **Rationale for selection**
- ▶ **Why exceptions**
- ▶ **How recruit**
 - **cost cannot be deterrent but promises must be met**
- ▶ **Consider hypotheses to be tested**

Human Subjects

- ▶ **Involvement of human subjects**
 - rationale for selection
 - Inclusion/exclusion
 - characteristics
- ▶ **Sources of material**
- ▶ **Recruitment/consent plans**
- ▶ **Potential risks**
- ▶ **Protecting against risks**
- ▶ **Risks vs benefits**

The Rest of the Stuff

- ▶ **Consortium/Contractual arrangements**
- ▶ **Consultants**
- ▶ **Appendix**
- ▶ **Literature cited**

Sources of Research Support

Most common mechanism is the grant, which is a form of assistance

RO1 — Investigator initiated research grant

R03 — Small investigator initiated research grant

R21 — Exploratory investigator initiated grant

P01 — Program Project grant — supports a set of research projects conducted by several collaborating investigators

P50 — Center grant — an institutional grant used to fund multidisciplinary programs of medical research

K series — individual career awards

T series — institutional training grants

Contract - mechanism of procurement of site

UO1 — Cooperative Agreement — a form of research assistance where government is a partner in the research

**Grant Application: Form is called PHS 398 and is available online:
<http://grants.nih.gov/grants/funding/phs398/phs398.html>**

Mechanism whereby NIH solicits applications include:

Program Announcements (PAs)

Request for Applications (RFAs)

Request for Proposals (RFPs)

list of NIH Guide to Grants and Contacts — list PA, RFAs & RFP

General Information

Abbreviations and Acronyms

CFR	= Code of Federal Regulations
CSR	= Center for Scientific Review (formerly DRG)
DCB	= Division of Cancer Biology
DCCPS	= Division of Cancer Control and Population Science
DCP	= Division of Cancer Prevention
DCTD	= Division of Cancer Treatment and Diagnosis
DEA	= Division of Extramural Activities
DHHS	= Department of Health and Human Services
DRG	= Division of Research Grants (renamed CSR)
EAB	= Extramural Advisory Board
FSR	= Financial Status Report
FY	= Fiscal Year
GAB	= Grants Administration Branch
GMO	= Grants Management Officer
GMS	= Grants Management Specialist
ICD	= Institute, Center, Division
IRG	= Initial Review Group
MIS	= Minority Investigator Supplement
NCAB	= National Cancer Advisory Board
NCI	= National Cancer Institute
NIH	= National Institutes of Health
ODDES	= Office of the Deputy Director for Extramural Science
OFM	= Office of Financial Management
OMB	= Office of Management and Budget
PA	= Program Announcement
PHS	= Public Health Service
R&D	= Research and Development
RFA	= Request for Applications
RPG	= Research Project Grant
SBIR	= Small Business Innovative Research
SNAP	= Streamlined Noncompeting Award Process
SRA	= Scientific Review Administrator
STTR	= Small Business Technology Transfer
USC	= United States Code

NIH Organization

**NIH: National Institutes of Health –
supports 1/3 of biomedical research in the US**

NCI: National Cancer Institute (CA)
NEI: National Eye Institute (EY)
NHLBI: National Heart, Lung and Blood Institute (HL)
NIA: National Institute on Aging (AG)
NIAAA: National Institute for Alcohol Abuse and Alcoholism (AA)
NIAID: National Institute of Allergy and Infectious Diseases (AL)
**NIAMS: National Institute of Arthritis and Musculoskeletal and Skin
Diseases (AR)**
**NICHD: National Institute of Child Health and Human
Development (HD)**
NIDA: National Institute on Drug Abuse (DA)
**NIDDK: National Institute of Diabetes and Digestive and Kidney
Diseases (DK)**
NIDR: National Institute of Dental Research (DE)
NIERS: National Institute of Environmental Health Sciences (EH)
NIGMS: National Institute of General Medical Sciences (GM)
NIMH: National Institute of Mental Health (MH)
NINDS: National Institute of Neurological Disorders and Stroke (NS)
NCHGR: National Center for Human Genome Research (HG)
NINR: National Institute for Nursing Research (NR)
NCRR: National Center for Research Resources (RR)

Fogarty International Center (TW)
National Library of Medicine (NLM)

National Centers for Disease Control and Prevention (CDC)
Occupational Health and Safety Administration (OSHA)
Agency for Health Care Policy and Research (AHCPR)