

Version: 4.0

Application Version Date: 8/20/2013

Date: Thursday, February 27, 2014 7:12:18 AM

1. Project Identification and Abstract

1.1. * Type of Submission:

Research Protocol or Study on Human Subjects

Grant/Contract Only

Facilitated Review (NCI CIRB)

USC/CHLA Collaborative Review

Use of Humanitarian Use Device (Not Research)

Ceded Review (Utilize approval by an outside IRB)

1.2. * Full Title of Research Protocol

Studies to Evaluate Cellular Heterogeneity Using Transcriptional Profiling of Single Cells

1.3. * Short Title

Single Cell Transcript Profiling

1.4. **Abstract: Provide a simple explanation of the study and briefly address (in 1 to 2 sentences) each of the following points: rationale; intervention; objectives or purpose; study population or sample characteristics; study methodology; description of study arms (if appropriate); study endpoints or outcomes; follow-up; statistics and plans for analysis.**

Our overall aim is to assess technical and biological noise in measured RNA levels in single cells in a number of human tissue types, and to develop analytical tools to address the complexity observed at the single-cell level. Written informed consent will be obtained from donors of various cell types (syncytiotrophoblasts, olfactory neurons, Purkinje neurons, and cortical neurons). Using patch clamp to extract cell contents and RNA-Seq, we will generate single-cell transcriptome datasets to evaluate heterogeneity among ostensibly similar cells. Data analysis will seek to identify sources of technical noise and to develop a systematic approach to reducing technical noise. We also will test whether neuronal plasticity is reflected as a change in the transcriptome. Our ultimate goal is to use these data combined with other data (e.g., genomics, proteomics, metabolomics) to advance the understanding of psychiatric brain disorders.

Assessing the relative magnitude of technical noise from different sources will inform how to reduce that noise in future experiments, and thereby reduce interference with studies of meaningful biological variations or noise. Biological noise, or inter-cell differences arise from differences in cellular history or fate, stages of cell cycle, connections to neighboring cells, and true functional differences of ostensibly identical cells (e.g., different olfactory receptors among olfactory neurons).

We propose to study three different cellular systems that we expect to have different levels of inter-cell variation (biological noise): first, [REDACTED], which are expected to have relatively low inter-cell variation; second, olfactory neurons from nasal neuroepithelium, each of which is expected to express a different olfactory receptor, providing a positive control for differences in the RNA-Seq data; and third, individual Purkinje neurons from the cerebellum, which may have larger inter-cell variation.

The method to extract cytoplasm from individual cells -- patch clamp pipette extraction -- does not require fully disrupting the tissue or dispersing the cells. We have already used patch clamp to determine the transcriptomes of multiple individual neurons in the mouse brain, using the cytoplasm extracted from single cells on which we had already performed patch-clamp electrophysiology recordings, followed by RNA-Seq. For each of the cell types chosen [REDACTED], olfactory neurons, Purkinje neurons, cortical neurons we will generate single-cell transcriptome datasets to evaluate heterogeneity among ostensibly similar cells, using patch clamp to extract cell contents and RNA-Seq; investigate sources of technical noise and apply a systematic approach to reduce technical noise. We will test whether neuronal plasticity is reflected as a change in the transcriptome.

1.5. * Select which IRB you are requesting review from:

USC-Health Sciences (HSC)

2. Study Personnel

2.1. Study Personnel and their roles:

	Last Name	First Name	Organization	Study Role	Certifications	Obtain Consent
View			PSYCHIATRY & BEHAVIORAL SCIENCES	Principal Investigator		no
View			PSYCHIATRY & BEHAVIORAL SCIENCES	Study Contact Person		no
View			CELL & NEUROBIOLOGY	Co-Investigator		no
View			PHYSIOLOGY & BIOPHYSICS	Co-Investigator		no
View			PSYCHIATRY & BEHAVIORAL SCIENCES	Co-Investigator		yes
View			NEUROLOGICAL SURGERY	Co-Investigator		yes
View			PSYCHIATRY & BEHAVIORAL SCIENCES	Co-Investigator		no
View			PREVENTIVE MEDICINE	Co-Investigator		yes
View			DAVIS SCHOOL OF GERONTOLOGY	Research Assistant or Associate		yes
View			OBSTETRICS & GYNECOLOGY	Research Assistant or Associate		yes
View			NEUROSCIENCE	Research Assistant or Associate		yes
View			NEUROLOGY	Subinvestigator		yes
View			NEUROLOGICAL SURGERY	Subinvestigator		yes
View			NEUROLOGICAL SURGERY	Subinvestigator		yes
View			NEUROLOGICAL SURGERY	Subinvestigator		yes
View			NEUROLOGICAL SURGERY	Subinvestigator		yes
View			NEUROLOGY	Subinvestigator		yes
View			NEUROLOGICAL			

SURGERY

Subinvestigator

yes

2.2. Is the Principal Investigator a student, resident, fellow, other trainee, or visiting scholar at USC/CHLA?

Yes No

2.3. If there are any individual collaborators from other institutions, check here:

2.4. Does this study require Cancer Center Committee (CIC) approval?

Yes No

2.4.1. Are Cancer Patients Involved? Yes No

2.5. Specify the group/organization who has reviewed this study for scientific merit:

3. Required Department Approvals (for a study already submitted to the IRB)

This screen indicates the division/department approvals received once the proposal has been submitted.

3.1. Pending Division/Department Approvals:

Name Division/Department Parent Campus

There are no items to display

3.2. Received Division/Department Approvals:

Name	Division/Department	Parent Campus
CELL & NEUROBIOLOGY	Department	USC-Health Sciences (HSC)
NEUROLOGICAL SURGERY	Department	USC-Health Sciences (HSC)
PHYSIOLOGY & BIOPHYSICS	Department	USC-Health Sciences (HSC)
PREVENTIVE MEDICINE	Department	USC-Health Sciences (HSC)
PSYCHIATRY & BEHAVIORAL SCIENCES	Department	USC-Health Sciences (HSC)

3a.3. Other campus committees, services or departments that need to review and approve this protocol:

Committee Name Committee Chair Approval Memo

There are no items to display

3a.4. Will the research be conducted through the CTU?

Yes No

4. Funding Information

4.1. * What existing, planned, or pending support will be used for this study? (check all that apply)

Cooperative Group (SWOG, COG, RTOG, etc.)

CTSI

Department of Defense (DOD) Funds

Departmental/Institutional Funds

Federal Grant/Contract

Foundation Grant/Contract

Industry

Intramural/Internal Grant

Residual Funds

State or Local Grant/Contract

Subcontract from another institution

No Funding

Other

- 4.2. If the funding source has undergone separate review by the IRB (i.e., cooperative group grants, umbrella grants, multi-project/program grants, center grants), try to select it from the list using the "Add" button. If the funding source is not displayed in the list, enter the information in question 4.4.

Grant #	Principal Investigator	Grant Title
There are no items to display		

- 4.2.1. If the grants selected in question 4.2 fund multiple studies, please attach the specific pages of the grant that are relevant to THIS study.

name	Version	Modified
There are no items to display		

- 4.3. If applicable, select a clinical trial from the TRUE2 system:

- 4.4. Add the details of each source of funding for this study.

Sponsor	Principal Investigator	Type of Funding

[View](#)

5. Type of Study Review

- 5.1. Select the type of review that you are requesting for this study:

Full Committee Review

Expedited Review

Exempt Review

Coded Specimens/Data

- 5.2. Attach the protocol here. For simple, investigator-initiated studies, a separate protocol may not be necessary. However, larger, complex, or multi-site studies require a fully developed protocol. If you have questions contact the IRB office to discuss.

name	Version	Modified
Single Cell Transcript Profiling_Research Strategy.pdf History	0.01	7/16/2012 1:23 PM
Single Cell Transcript Profiling_Specific Aims.pdf History	0.01	7/16/2012 1:24 PM

- 5.3. Attach the sponsor's template informed consent here.

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- 5.4. If any study documents are password protected, enter the passwords here.

- 5.5. If there is a sponsor protocol number associated with this file, specify it here:

5a. Type of Study Review - Expedited Review

This screen is required if you are requesting an expedited review for this study (Question 5.1.) If this is the incorrect review type, please return to page 5 to make changes.

- 5a. If you checked expedited review, please choose the applicable category from the list and attach your data collection forms below (click on the abbreviated category to receive the full description):

Short Description (click for full description)

(1) Clinical studies of drugs and medical devices only when condition (a) or (b) is met...

(2) Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture...

(3) Prospective collection of biological specimens for research purposes by noninvasive means...

(4) Collection of data through noninvasive procedures routinely employed in clinical practice, excluding procedures involving x-rays or microwaves...

(5) Research involving materials that have been collected, or will be collected solely for nonresearch purposes...

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies...

6. Study Location(s)

6.1. **Select the locations where this study will be conducted by the USC/CHLA investigator(s) (check all that apply):**

HSC - Health Sciences Associated Locations

UPC - University Park Associated Locations

CHLA

6.2. **Are there other sites besides USC/CHLA involved in the research?**

Yes **No**

6a. HSC Location(s)

This screen is required if you indicated HSC - Health Sciences Associated Locations (Question 6.1.)

6a.1. **Locations that recruitment, consent, and/or study procedures will be performed: (check all that apply)**

Location

LAC+USC Medical Center

LAC+USC Emergency Dept

LAC+USC Outpatient Clinics

LAC+USC 5P21 Building

Keck Hospital of USC Facilities

USC Norris Comprehensive Cancer Center Facilities

Keck School of Medicine of USC

USC Eye Institute

USC Healthcare Consultation Center I or II

USC Center for Health Professions (CHP)

USC School of Dentistry

El Monte Comprehensive Health Center *

H. Claude Hudson Comprehensive Center *

Roybal Comprehensive Health Center *

Verdugo Hills Hospital

Other location (e.g., subjects home, community)

6a.2. **Describe other location(s):**

6a.3. **If you are conducting this research in an LAC+USC location, specify the room numbers:**

Neurosurgical ORs

6a.4. If you are conducting this research at a location marked with an asterisk "*", attach a letter of approval from the medical director.

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There are no items to display

9. Methods and Procedures - Selected Descriptors/Community Engaged Research

Note: The list of items below IS NOT an all-inclusive list of methods and procedures available to investigators. The list only includes items that will trigger additional questions specific to areas of research or are necessary for the review process.

9.1. This study will involve: (check all that apply)

Prospective collection of data/specimens

Use of existing or retrospective data/specimens

9.2. Study Procedures: (check all that apply)

Audio/Video Recordings or Photographs

Behavioral Observations and/or Behavioral Experimentation

Behavioral Interventions

Deception

Interview/Focus Groups

Population-based Field Study

Psychophysiological Testing

Surveys/Questionnaires/Psychometric Testing

Anatomic Pathology Specimens

Approved/Investigational Devices

Approved/Investigational Drugs and Biologics

Biohazardous Substances

Controlled Substances

Creation of a Data or Tissue Repository

Emergency Research (with exception from informed consent requirements)

Gene Transfer Study

Heritable Genetic Specimens or Germ Line

Magnetic Resonance Imaging (MRI) or ultrasound other than clinically indicated

Radiation Exposure Other Than Clinically Indicated Tests and/or Therapy (e.g. x-ray, CT, DEXA, radiation therapy, etc.)

Stem Cell Research

Substance Abuse Treatment (with medication)

Venipuncture

9.4. Will data from this study be submitted to the NIH Genome-Wide Association Studies (GWAS) data repository?

Yes No

9.4.1. Provide the name and complete mailing address for the NIH official who will receive the certification letter from the USC/CHLA institutional official.

[Redacted name and address]



9.5 Does your study involve community-engaged research (community-engaged research addresses community needs and involves the community in research plan, conduct of study, etc)?

Yes No

10. Characteristics of the Study Subject Population

10.1. What is the maximum number of subjects you plan to recruit for this site? (Integer values only)

500

10.1.2. If necessary, provide further explanation of accrual goals for all subject populations.

10.2. Describe the inclusion criteria for enrollment. *(HSC: Refer to specific sections of the protocol/grant, if applicable)*
See Section C2 and subsections

10.3. Describe the exclusion criteria for enrollment. *(HSC: Refer to specific sections of the protocol/grant, if applicable)*
See Section C2 and subsections

10.3.1. If there are any age, ethnic, language, or gender-based exclusion criteria, please provide justification.

11. Research Objectives and Background

11.1. Describe the specific objectives or aims of the study and hypotheses or research questions. *(HSC: refer to specific sections of the protocol/grant, if applicable)*

See Specific Aims in attached grant

11.2. Provide a summary of the background of the study, and explain how this research will contribute to existing knowledge. Describe previous work that provides a basis to show that the proposed research can be carried out without undue risk to human subjects. Include relevant citations. *(HSC: refer to specific sections of the protocol/grant, if applicable)*

See Section A Significance and Section B Innovation in the attached grant (Research Strategy)

12. Methods and Procedures - Prospective Studies

12.1. Describe in detail the design and methodology of the study. Provide a detailed description of the planned data collection, specific outcomes, and criteria for evaluation and endpoint definition. If applicable, include information on stratification or randomization plans. Include the frequency and duration of each activity and the total length of subject participation. Identify and distinguish between those procedures that are standard of care and those that are experimental. *(Refer to specific sections of the protocol/grant, if applicable. Describe any differences between the protocol and the local site.)*

See Section C Approach and all subsections (Research Strategy)

12.2. Describe the statistical considerations for the study, how the sample size was determined, and how the results will be analyzed, if applicable. *(Refer to specific sections of the protocol/grant, if applicable)*

See Section C Approach and all subsections (Research Strategy)

22. Special Subject Populations

22.1. Indicate any vulnerable subject populations you intend or expect to enroll in the research: (check all that apply)

Normal Volunteers

Employees or Students

Adults not Competent to Consent (or likely to lose the capacity to consent during the study)

Non-English Speaking Populations

Minors (subjects under 18 years of age)

Pregnant Women / Human Fetuses

Neonates (infants under 30 days old)

Prisoners/Detainees

Wards

None of the above

22d. Special Subject Populations - Non-English Speaking Subjects

This screen is required if you indicated you will be recruiting non-English speaking subjects (Question 22.1.)

22d.1. Describe how you will communicate with non-English speaking participants. (check all that apply)

The use of interpreters

Translated informed consent documents

Translated short forms

Other

22d.2. If the study will likely include subjects and families for whom Spanish is the primary language, the consent documents must be translated into Spanish. Select the method of translation.

Investigator will provide the IRB with a translation of the approved consent form

Request that the IRB office translate (HSIRB Only)

22d.3. If the research will primarily include subjects who speak a language other than English or Spanish, the informed consent documents should be translated into that language. Indicate the languages and method of translation.

Language Translation Method

There are no items to display

22f. Special Subject Populations - Pregnant Women/Human Fetuses

This screen is required if you indicated Pregnant Women/Human Fetuses as a special subject population (Question 22.1.)

22f.1. Justify the inclusion of pregnant women/human fetuses in the research: (check all that apply)

Where scientifically appropriate, preclinical studies, including studies on pregnant animals, and clinical studies, including studies on nonpregnant women, have been conducted and provide data for assessing potential risks to pregnant women and fetuses.

The risk to the fetus is caused solely by interventions or procedures that hold out the prospect of direct benefit for the woman or the fetus; or, if there is no such prospect of benefit, the risk to the fetus is not greater than minimal and the purpose of the research is the development of important biomedical knowledge which cannot be obtained by any other means.

Any risk is the least possible for achieving the objectives of the research.

The research holds out the prospect of direct benefit to the pregnant woman, the prospect of a direct benefit

both to the pregnant woman and the fetus, or no prospect of benefit for the woman nor the fetus when risk to the fetus is not greater than minimal and the purpose of the research is the development of important biomedical knowledge that cannot be obtained by any other means, and her consent is obtained.

If the research holds out the prospect of direct benefit solely to the fetus then the consent of the pregnant woman and the father is obtained in accord with the informed consent provisions of subpart A of 45 CFR 46, except that the father's consent need not be obtained if he is unable to consent because of unavailability, incompetence, or temporary incapacity or the pregnancy resulted from rape or incest.

Each individual providing consent is fully informed regarding the reasonably foreseeable impact of the research on the fetus.

For children who are pregnant, assent and permission are obtained in accord with the regulations governing research on children.

No inducements, monetary or otherwise, will be offered to terminate a pregnancy.

Individuals engaged in the research will have no part in any decisions as to the timing, method, or procedures used to terminate a pregnancy.

Individuals engaged in the research will have no part in determining the viability of a neonate.

Other

22f.1.1. Please explain:

Pregnant adult women who have elected to terminate pregnancies will be asked to donate placental tissue.

23. Study Resources

23.1. Describe the time the investigators have available to conduct and complete the research and justify that it is sufficient. Please check-off the items that apply to this study.

Employed interns, residents, fellows, or postdocs with dedicated time to conduct this research.

Employed faculty and or staff with dedicated time to conduct this research.

Students with dedicated time as part of their training to conduct this research.

Volunteers

Other

23.1.1. Please specify:

23.2. Describe the staff and justify their qualifications. Please check-off the items that apply to this study.

All biomedical investigators are privileged and credentialed to perform the study activities in the study locations.

All study staff are trained and credentialed to perform the duties assigned to them.

All study staff have fulfilled the training mandated by their respective departments or institutions.

Other

23.2.1. Please specify:

24. Subject Recruitment and Informed Consent

24.1. Recruitment Tools that will be used by the local site (check a box only if your site will control the use or distribution of the recruitment tool): (check ALL that apply)

E-mail/Electronic Mailing List

Brochure

Flyers

Letters

Newspaper/Magazine Advertisements

Radio/Television Announcements
Subject or Participant Pool
Telephone Scripts
Verbal (Personal Solicitation)
Website / Social Media Outlets
Other
None of the above

24.1.1. Please specify:

See grant section C2. Written informed consent for the use of discard tissue in genetic analyses and sharing of those data will be obtained from individuals undergoing neurosurgery or elective termination of pregnancy.

24.1.2. Describe how you will be obtaining contact information:

Co-investigators [redacted] and [redacted] will be notified when neurosurgeries or elective pregnancy terminations are being conducted and will meet potential subjects (without knowing personal identifiers in advance) at the time of the procedure.

24.2. Attach copies of all recruitment tools that will be used by the local site. (Do not attach any advertising or recruitment materials that will not be used at the local site or under control of the local site.)

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There are no items to display

24.3. Informed Consent and Waivers:

Check the type(s) of consent or waiver of consent planned for this study: (check ALL that apply)

Written/signed consent (participants will sign an informed consent document)
An information sheet will be provided and/or verbal consent obtained
Waiver of consent (participants will not be asked to sign a consent document or be given an information sheet)
Alteration of the elements of consent (participants will sign a consent document, but one or more of the basic required elements of consent will be altered or waived)

24.7. Attach copies of the informed consent documents(s), information sheets, and any statements of new information/findings or consent addenda (as applicable) that will be used in this study. This set should also contain any assent or parental permission documents that will be used.

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[IRB Informed Consent Templates and Forms](#)

Personnel from section 2.1 obtaining consent/permission/assent:

Last Name	First Name	Organization	Study Role	Certifications	Obtain Consent
[redacted]	[redacted]	PSYCHIATRY & BEHAVIORAL SCIENCES	Co-Investigator		yes
[redacted]	[redacted]	NEUROLOGICAL SURGERY	Co-Investigator		yes
[redacted]	[redacted]	PREVENTIVE MEDICINE	Co-Investigator		yes
[redacted]	[redacted]	DAVIS SCHOOL OF GERONTOLOGY	Research Assistant or Associate		yes
[redacted]	[redacted]	OBSTETRICS & GYNECOLOGY	Research Assistant or Associate		yes
			Research Assistant or		

		NEUROSCIENCE	Associate	yes
		NEUROLOGY	Subinvestigator	yes
		NEUROLOGICAL SURGERY	Subinvestigator	yes
		NEUROLOGICAL SURGERY	Subinvestigator	yes
		NEUROLOGICAL SURGERY	Subinvestigator	yes
		NEUROLOGY	Subinvestigator	yes
		NEUROLOGICAL SURGERY	Subinvestigator	yes

If the above list is incomplete or incorrect, please navigate to item 2.1 and make your changes there.

24.8. Describe the circumstances and location of the process of recruitment and consent: (check ALL that apply)

In a private area

In a waiting room, open ward, group, or public setting

Online, over the telephone, by mail, or via fax

Other

24.9. Describe how you will assess the individual's comprehension of the research and what it means to participate, including understanding of the voluntary nature of participating. (check ALL that apply)

An assessment tool will be used. (attach a copy of the tool below)

This will be verbally assessed. Individuals will be asked to answer the following questions (as applicable): (1) What are you being asked to do? (2) What question is this study trying to answer? (3) What are the potential risks of participating in this study? (4) How often will you need to come in for study visits? (5) What is the difference between participating in this study and your standard medical care? (6) What should you do if you decide to withdraw from the study?

Other (specify below)

24.10. Describe all measures that will be taken during the recruitment and consent process to ensure that individuals have adequate time to consider participation and to safeguard against potential coercion and undue influence: (check ALL that apply)

They will not be forced, threatened or coerced in any way to participate in this research, and no undue influence or other form of constraint will be used to recruit individuals to participate in this research or to retain currently enrolled subjects. (Note: "Coercion" is the use or threat of the use of force to gain compliance. "Undue influence" is when an individual who is in a position of authority (e.g., physician, teacher, employer) exerts inappropriate or excessive manipulation to gain power and compliance over a vulnerable individual (potential research subject). "Constraint" means force, obligation or pressure.)

They will not be punished or denied something which they would normally receive (e.g., threatening to withdraw health services to which an individual would otherwise be entitled) if they choose not to participate in this research or choose to withdraw early from participation.

They will be given an adequate amount of time to consider participation in the study relative to the initiation of study procedures.

The information presented to individuals during recruitment and consent will reflect that provided in the informed consent document/informed consent script.

The recruitment and consent process will not promise them a certainty of cure or benefit beyond what is outlined in the informed consent document/informed consent script.

The recruitment and consent process will take place in an area in which it is possible to maintain privacy and confidentiality.

They will be given the opportunity to take the informed consent document home in order to discuss participation with their family, friends and/or others before making a definitive decision.

They will receive payment for their participation, but the amount of payment will be commensurate with their participation (not an inducement for participation), and receipt of the payment will not be contingent upon the individual's completion of the study. (Note: The specific method, schedule and amount of payment must be outlined in the payment section of the application.)

Other (explain below)

25. Financial Obligation and Compensation

25.1. Financial Obligation: Describe who pays for financial obligations that the subject may incur as a result of participating in the study.

All costs are paid by the sponsor or funding agency.

Research costs are paid by the sponsor or funding agency. Other costs are the responsibility of the participants and/or their healthcare plans.

All costs are the responsibility of the participants and/or their healthcare plans.

Study drug will be provided but not the costs of preparation or administration, which will be the responsibility of the participants and/or their healthcare plans.

All costs are covered by the department/division.

There are no financial obligations related to participation.

Other

25.2. Payment for Participation: Describe how much, if any, financial or other form of compensation will be provided to the subject/family. Describe the requisite conditions that must be fulfilled to receive full or partial compensation. Describe the proposed method of timing and disbursement. If children are involved, please specifically address how the compensation will be distributed to children.

No remuneration will be offered.

25.3. Research-Related Injury and Compensation for Injury: For studies of greater than minimal risk, if participants require care, medical services, or psychological services as a consequence of the research, who will provide this care? If applicable, describe who will pay for research-related injuries.

Medical and/or psychological care/treatment will be offered. In addition:

Costs for medical care from research-related injuries will be paid by the sponsor or funding agency.

Costs for medical care from research-related injuries will be the responsibility of the participants and/or their healthcare plans.

Other

25.3.A. Consent Text: The following injury statement must be contained in the informed consent documents for this study: (edit only as necessary. If your study has a contract, this language must be consistent with the contract language)

It is important that you tell the study doctor, [insert name] MD, if you feel that you have been injured because of taking part in this study. You can tell the doctor in person or call him/her at [insert phone number].

If you require medical care/treatment for an injury you experience while participating in this study, medical care/treatment will be provided. The tests and procedures being provided for you during this study are routine tests and procedures used to treat your illness, and you would receive these tests and procedures if you were not participating in the study. You and/or your health plan/insurance company will be billed for the cost of treatment for all injuries you may experience during your participation in the study, and you will be responsible for any co-payments and deductibles that are standard for your health plan/insurance coverage. The costs for this medical care/treatment will not be paid for by the study sponsor.

However, by signing this form you have not given up any of your legal rights.

26. Participant Privacy and Data Confidentiality

26.1. Privacy Protections: Privacy is a participant's ability to control how other people see, touch, or obtain information about his/her self. Violations of privacy can involve circumstances such as being photographed or videotaped without consent, being asked personal questions in a public setting, being seen without clothing, being observed while conducting personal

behavior, or disclosing information about abortions, HIV status, or illegal drug use.

Select the provisions to protect the privacy of the individual during screening, consenting, and conduct of the research: (check ALL that apply)

Research procedures will be conducted in person in a private setting.

Data will be captured and reviewed in a private setting.

Only authorized research study personnel will be present during research related activities.

The collection of information about participants is limited to the amount necessary to achieve aims of the research.

Participants will not be approached in a setting or location that may constitute an invasion of privacy or could potentially stigmatize them.

Other (specify below)

26.2. Confidentiality Precautions: Confidentiality is an extension of the concept of privacy; it refers to the participant's understanding of, and agreement to, the ways identifiable information will be collected, stored, and shared. Identifiable information can be printed information, electronic information, or visual information such as photographs.

How will the research data/specimens be recorded? (check ALL that apply)

Data and/or specimens will be directly labeled with personal identifying information. (Identifiable)

Data and/or specimens will be labeled with a code that the research team can link to personal identifying information. (Coded)

Data and/or specimens will not be labeled with any personal identifying information, nor with a code that the research team can link to personal identifying information. (Anonymous)

Other (explain below)

26.3. How will the research data and/or specimens be protected against inappropriate use or disclosure? (check ALL that apply)

Locked office

Locked storage unit

Restricted access to authorized study personnel

Secure computer/laptop

Individual ID plus password protection

Encryption of digital data

Network Restrictions

Security software (firewall, antivirus, anti-intrusion) is installed and regularly updated in all servers, workstations, laptops, and other devices used in the study

Restrictions on copying study related materials

Destruction of source data immediately after data collection (to preserve anonymity of participants)

Audio and/or video recordings will be transcribed and then will be destroyed

Audio and/or video recordings will be modified to eliminate the possibility that study participants could be identified

Photos or images will be modified to eliminate the possibility that study participants could be identified

Study personnel will sign statements agreeing to protect security and confidentiality of study information

Access rights are terminated when authorized study personnel leave the study

Not Applicable

Other (specify below)

26.4. Will coded or identified data and/or specimens be released to a third party (external to USC/CHLA)?

Yes No

26.4.1. Specify what data and/or specimens will be released, to whom (the individuals and/or agencies), and why.

Genetic data (RNA sequence and expression levels) will be placed in public databases (such as dbGaP) for use by qualified investigators. Demographic data (e.g., sex, age) also may be available with the genetic data but no personal identifiers will be released.

26.5. What will happen to the research data and/or specimens at the conclusion of the study? (check ALL that apply)

Direct identifiers and/or the key to the codes will be destroyed upon completion of the research (all data/specimens will be stripped of identifying information and/or the key to codes destroyed, paper documents shredded, electronic files purged, electronic media securely erased).

Retained for study record keeping purposes per institutional policy.

Retained by the investigator for future research use.

Retained for future research use (create data or tissue repository/bank).

Restricted use data will be destroyed or returned to the source.

No direct or indirect identifiers are being collected. The anonymous data and/or specimens will be retained at the discretion of the investigator.

This research is a clinical trial conducted under FDA regulations. Direct identifiers and/or the key to the codes will be destroyed as directed by the sponsor (IND/IDE holder) in accordance with FDA regulations.

Other (specify below)

26.6. Do you have, or plan to apply for, a DHHS issued Certificate of Confidentiality for this study?

Yes No

27. Risk/Benefit Assessment - Risks

27.1. Risks, Discomforts and Potential Harms: Describe the risks associated with each research intervention. Include consideration of physical, psychological, social, and other factors. (check all that apply)

Discrimination based on genetic findings.

Some people may find it upsetting to learn that they have certain mutations or errors in genes that could lead to future health problems for themselves or their children.

Some of the questions may make the participant feel uneasy or embarrassed.

There is a small risk that people who are not connected with this study will learn a participant's identity or their personal information.

The participants are providing highly sensitive, personal information in this study. If people not connected with the study learn this information, they could have problems getting a new job, keeping their current job, finding housing, or getting insurance (health, disability, or life insurance). In highly unlikely situations, they could be charged with a crime.

Biomedical risks, including drug, device, biologics, radiation, surgery or other research procedures (please specify).

The research includes the risk or disclosure that a participant may engage in self-harm or attempt suicide.

Venipuncture risks including: mild discomfort (or pain), bruising and swelling around the puncture site, dizziness or fainting, or infection (rare).

Other (specify below)

27.1.1. Describe the biomedical or other possible risks and discomforts participants could experience during this study: (HSC: refer to specific sections of the protocol, grant, investigator's brochure or product labeling, if applicable)

As stated in the informed consent, there is a small chance that an individual's identity could be determined from his/her genetic information. A group of scientists recently used sophisticated and highly technical methods to deduce the identity of donors from RNA polymorphism patterns and expression levels. The scientists did this as part of a research study designed to show that it is at least possible to do this.

27.2. Describe the precautions that will be taken to minimize risks/harms. (check all that apply)

We will use our best efforts to keep the findings in this study as confidential as possible.

Subjects can choose to skip or stop answering any questions that make them uncomfortable.

Data will be coded and identity stored separate from data.

Data will be collected anonymously.

Biomedical precautions, including precautions relating to drugs, devices, biologics, radiation, surgery or other research procedures (please specify).

Venipuncture by individuals certified and privileged to perform the procedure.

Other (specify below)

27.2.1. Other precautions (including biomedical precautions) that will be taken to minimize risks/harms include:
(HSC: refer to specific sections of the protocol/grant, if applicable)

Genetic data that is submitted to dbGaP is made available by the NIH to qualified investigators who indicate that they will not attempt to determine the identity of the research subjects.

28. Risk/Benefit Analysis - Potential Benefits and Alternatives

28.1. Describe any potential for direct benefits to participants in the study: (check all that apply)

There are no direct benefits to some or all of the research participants

Improvement in some or all of participants' symptoms

Improvement in some or all of participants' survival or longevity

Information gained from testing or monitoring procedures

Provision of drug or device

Reduced side effects

Other (explain below)

28.2. Describe potential benefits to society, if any. (check all that apply)

The advancement of knowledge

A new treatment or therapy for the condition under study

None

Other (explain below)

28.3. What are the alternatives to participation? (check all that apply)

Not participating

Continue current medical care for their condition

Participation in other research studies

Palliative care

No treatment or therapy

Participate in other subject pool activities

Other (specify below)

28.4. Risks in relation to benefits:

The potential benefits to the research participants justify exposure of the participants to the risks.

The potential benefits to humanity justify exposure of the participants to the risks.

Other (specify below)

35. Is the HIPAA Privacy Rule Applicable?

35.1. Do you intend to access, review, collect, use or disclose protected health information (PHI) in your research?
Answer yes if you intend to do any of the following:

- Look at medical records (paper or electronic) to identify potential research participants
- Look at clinic logs to identify potential research participants
- Record demographic information obtained from medical records (paper or electronic)
- Record health information obtained from medical records (paper or electronic)
- Obtain information from laboratory reports, pathology reports, radiology reports or images, or other reports from medical or mental health testing and treatment

- Obtain information from medical billing records
- Record or use medical record numbers or other information that could be used to identify an individual (review the list of HIPAA identifiers below)

Yes No

35.2. Do you intend to record data that contains any of the 18 elements defined by HIPAA as identifiers (listed below), in your research?

Yes No

- Name/Initials
- Street address, city*, county*, precinct*, zip code*, or equivalent geocodes*
- All elements of dates (except year) directly related to an individual (date of birth, admission date, discharge date, date of death)*
- Elements of date, including year, for persons 90 or older
- Telephone number
- Fax number
- Electronic mail address
- Social Security Number
- Medical record number
- Health plan identification number
- Account number
- Certificate/license number
- Vehicle identifiers and serial numbers, including license plate number
- Device identifiers and serial number
- Web addresses (URLs); Internet IP addresses
- Biometric identifiers, including finger and voice print
- Full face photographic images and any comparable images
- Any other unique identifying number, characteristic, or code*

35.3. Are you going to record only the personal identifiers marked with an asterisk (*)? If so, you may be able to obtain or use such health information from a healthcare provider for research purposes without an authorization. Under the HIPAA Privacy Rule, this data constitutes a "limited data set". if you are creating or obtaining a limited data set, you must complete a Data Use Agreement. Attach a copy of the signed Data Use Agreement below.

name	Version	Modified
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There are no items to display

[USC Template Data Use Agreement](#)

36. HIPAA Analysis

This screen is only required if you indicated HIPAA is applicable by answering "yes" to Question 35.1.

36.1. If you are using or accessing protected health information in order to identify potential participants, indicate if these activities fall under the rules for Activities Preparatory to Research, if you will be applying for a Partial Waiver of HIPAA Authorization for the purposes of screening and recruiting, or if neither option applies.

(CHLA Only) Activities Preparatory to Research

Partial Waiver of HIPAA Authorization for screening, recruiting, and identifying participants

None of the Above

36.2. If you are using or accessing protected health information to conduct the research, please select whether you will be obtaining authorization from the participant or requesting a Full Waiver of HIPAA Authorization.

Obtaining HIPAA authorization from participant

Full Waiver of HIPAA Authorization

36.2.1. If you are obtaining authorization from the participant, attach the HIPAA authorization forms here (USC Only). Please [click here](#) to download the HIPAA Authorization template forms from OPRS.

name	Version Modified
HS-12-00474_Single Cell Tx_HIPAA.doc History	0.01 7/2/2013 12:31 PM

39. Conflict Of Interest Information

39.1. Does the **Investigator**, **Research Personnel** or **Close Relation** have an **ownership interest** (any equity in a non-publicly traded company, regardless of value, or stock, stock options or warrants, in a publicly traded company of \$5,000 or more excluding mutual funds) in:

- The sponsor of the research; or
- An entity that has a license or is negotiating a license to the intellectual property (e.g., patents) developed from this research; or
- An entity that has an economic interest in the research.

Yes **No**

39.2. Does the **Investigator**, **Research Personnel** or **Close Relation** have a **management role** (such as director, officer, scientific, or technical appointment), or any other role with significant decision-making authority, in:

- The sponsor of the research; or
- An entity that has a license or is negotiating a license to the intellectual property (e.g., patents) developed from this research; or
- An entity that has an economic interest in the research.

Yes **No**

39.3. Did the **Investigator**, **Research Personnel** or **Close Relation** receive in the last twelve months or does the Investigator, Research Personnel or Close Relation expect to receive in the next twelve months any payments for **services** (such as speakers fees, payments for consulting, participation on an advisory board, or assistance with protocol design) from

- The sponsor of the research; or
- An entity that has a license or is negotiating a license to the intellectual property (e.g., patents) developed from this research; or
- An entity that has an economic interest in the research.

This does not include salary for services as an investigator/staff on the research study. Also excluded are payments from the federal government for services performed (i.e. peer review, study section participation, seminars, lectures, or service on advisory committees).

Yes **No**

39.4. Does the **Investigator**, **Research Personnel** or **Close Relation** personally receive **intellectual property rights** (e.g. patents, copyrights, or royalties) directly from:

- The sponsor of the research; or
- An entity that has a license or is negotiating a license to the intellectual property (e.g., patents) developed from this research; or
- An entity that has an economic interest in the research.

This does not include royalties paid directly from USC

Yes **No**

39.5. **To the investigator's knowledge, does the Institution have financial and or intellectual property interests in the sponsor or the products used in this project?** *An institutional conflict may occur when a financial interest of the University has the potential to bias the outcome of research conducted by its employees or students or to create an unacceptable risk to*

human subjects.

Yes No

40. Additional Supporting Documents

40.1. Attach any other documents that have not been specifically requested in previous questions, but are needed for IRB review.

name	Version	Modified
Investigators_Agreement_Coded_Samples.pdf History	0.01	7/20/2012 5:20 PM
Invest Agreement_7.19.12.PDF History	0.01	7/20/2012 5:19 PM
Investigators_Agreement_Coded Samples.pdf History	0.01	7/20/2012 5:19 PM

40.2. If there is any additional information that you wish to communicate about the study include it below. Please note, this section should not be used instead of the standard application items.

Please translate the informed consent to Spanish.

99. Instructions for Submission

You have reached the end of the application. When you are sure of the content, the following steps may be taken to submit your application for review.

1. Click the "**Finish**" button on the top or bottom application navigator bar to return to the workspace.
2. Use the SmartForm Progress Calculator to determine that all sections of the application are filled out correctly.
3. Use the "**Send Study Ready Notification**" activity to send an email to the Principal Investigator and Co-Investigators with instructions for reviewing and submitting the application.
4. **All listed Co-Investigators (indicated in item 2.1.) must use the "Agree to Participate" activity and answer yes.**
5. Once all the Co-Investigators have agreed to participate, the **Principal Investigator** (indicated in item 2.1.) can submit the application by using the "**Submit Application to _____**", where _____ indicates the IRB you are submitting to.
6. The PI will have to check the PI endorsement box. The PI will also have to check the student endorsement box if it is applicable.
7. The application is submitted. The state indicator in the top left of the workspace will no longer display Pre Submission.
8. The PI and Study Contact Person will receive an email confirming the application has been submitted.

4.4. Funding Source

Please enter the fields below and click 'OK' when done.

4.4.1. * Name of Sponsor:

[REDACTED]

4.4.2. * Named Principal Investigator:

[REDACTED]

4.4.3. Institution awarded the grant-award:

USC

4.4.4. Grant-award number provided by the Sponsor:

[REDACTED]

4.4.5. Title of the Funding Project, if applicable:

Studies to Evaluate Cellular Heterogeneity Using Transcriptional Profiling of Single Cells

4.4.6. * Type of Funding:

[Redacted]

4.4.7. Attach a copy of the proposal/contract/grant with the project budget. (salary information need not be displayed or included.)

name	Version Modified	
Studies to Evaluate Cellular Heterogeneity Using Transcriptional Profiling of Single Cells	0.01	7/20/2012 5:22
 History		PM