Title of research study: Investigating the stability, variability and mechanism of incorporation of lipid mediators into eccrine sweat

Investigator: ***John W. Newman, Ph.D.***

Why am I being invited to take part in a research study?

We invite you to take part in this research study because you are a generally healthy male, age 20-40 years, who does not perform vigorous physical activity on a regular basis.

What should I know about a research study?

(Experimental Subject's Bill of Rights)

- Someone will explain this research study to you, including:
  - The nature and purpose of the research study.
  - The procedures to be followed.
  - Any drug or device to be used.
  - Any common or important discomforts and risks.
  - Any benefits you might expect.
  - Medical treatment, if any, that is available for complications.
- Whether or not you take part is up to you.
- You can choose without force, fraud, deceit, duress, coercion, or undue influence.
- You can choose not to take part.
- You can agree to take part now and later change your mind.
- Whatever you decide it will not be held against you.
- You can ask all the questions you want before you decide.
- If you agree to take part, you will be given a signed and dated copy of this document**.**

Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team: study coordinator: Karan Agrawal, M.Sc. at (530) 752-5217, principal investigator: John Newman, Ph.D. at (530) 752-1009

This research has been reviewed and approved by an Institutional Review Board ("IRB"). Information to help you understand research is on-line at http://www.research.ucdavis.edu/policiescompliance/irb-admin/.You may talk to a IRB staff member at (916) 703-9151, hs-irbadmin@ucdavis.edu, or 2921 Stockton Blvd, Suite 1400, Room 1429, Sacramento, CA 95817 for any of the following:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research subject.
- You want to get information or provide input about this research.

Why is this research being done?

The purpose of this study is to see what the differences are in sweat (amount and small molecule content) collected from different sites of the body and by different methods of sweat stimulation. Additionally, we want to know whether the amount and small molecule content of the sweat is the same in an individual over time, and the same across individuals at a given time. Finally, we want to know how consumption of over-the-counter anti-inflammatory drugs such as ibuprofen will affect the inflammatory mediator content of sweat and how that compares to blood. This information will help us to better understand the composition and behavior of sweat and assess its potential utility as a routine clinical tool in skin research.

How long will the research last?

We expect that you will be in this research study for approximately six months. You will be asked to attend four study visits at our research center. The first three visits will last between 1-2 hours. The fourth visit will last 5 hours. Each visit will be separated from the previous visit by at least one week.

How many people will be studied?

We expect about 17 people to enroll in this study.

What happens if I say yes, I want to be in this research?

If you decide to volunteer, you will first be pre-screened by a member of our research team to see if you are eligible for enrollment. This screening visit will be conducted either in-person or on the telephone and will last about 20 minutes. During this pre-screen, the research team will fill out a questionnaire based on your responses to questions related to your health and supplement and medication use.

If you are eligible to be enrolled into the study you will be asked to participate in an approximately 4-6 week long study that will be conducted at the USDA Western Human Nutrition Research Center located in 430 W Health Sciences Dr, Davis, CA 95616. You will be asked to participate in 4 study day visits that will be scheduled about 1- week apart. The first three study visits will last about 1-2 hours each and the fourth study visit will last about 5 hours.

You will be asked to fast overnight (12 hours) before each study visit (no food or beverage, but you can drink as much water as you like) and avoid applying any cream or medication to your body for 24 hours before your study visit. Addtionally, you will be asked to avoid consuming any non-steroidal anti-inflammatory drugs such as aspirin, ibuprofen (Advil, Motrin, etc), acetaminophen (Tylenol) or naproxen (Aleve) for at least 48 hours before your study visit.

During each study visit, we will collect sweat using a device designed for sweat collection in infants. For sweat collection:

1. Your skin will be cleaned with an alcohol wipe and wetted with water
2. Electrodes containing gel disks will be placed on two areas of your body and secured with straps or tape. The electrodes will be attached to a power source and a mild electric current, which is generally painless will be applied for 5 minutes.
3. One of the electrodes will be removed and the area cleaned with water while a marker will be used to mark the area where the other electrode is attached. The other electrode will then be removed and the area will be cleaned with water.
4. After the electrodes have been removed, a collection device consisting of a thin plastic tube coiled inside a disk will be attached to your skin (where the electrode previously was) using straps or tape and secured with an elastic band or bandage. You will be asked to sit for 30 minutes while we collect sweat. The collection device will then be removed.

During your first study visit, after obtaining informed consent, we will collect sweat from the inner part of one of your forearms (near the wrist) as described above. We will then ask you to ride a stationary bicycle for up to 15 minutes after which we will use a sweat collection device (step 4 above) on your other forearm to collect sweat for 30 minutes. While you are on the stationary bicycle, we will measure your heartrate and blood oxygen capacity using a non-invasive finger sensor and also measure your metabolic rate by asking you to breathing normally into a face mask fit snugly over your mouth and nose.

During your second study visit, we will collect sweat from the inner part of one of your forearms (near the wrist) and also the upper surface of your thigh (near the knee). Both collections will occur almost simultaneously and will follow the procedure described above.

During your third study visit, we will collect sweat from the inner part of both of your forearms (near the wrist) and your lower back. All collections will start at approximately 10 minute intervals and will follow the procedure described above.

Prior to your fourth study visit, you will undergo a video interview with the study physician, Dr Raja Sivamani. During this interview, Dr Sivamani will review your medical history to make sure you can safely consume ibuprofen. Dr Sivamani will also go over the risks and side-effects associated with ibuprofen consumption during the interview.

During your fourth study visit, we will collect a sweat sample from the inner part of one of your forearms (near the wrist) using the procedure described above. We will also collect a blood sample (about one teaspoon) from your other arm. After we collect blood and sweat, you will be asked to consume 400 mg (two tablets) of ibuprofen. We will then collect blood and sweat from you 30 minutes, 2 hours and 4 hours after you consume the ibuprofen.

After four study visits, your participation in the study is complete and we will process your compensation.

While you will remain fasted during each study visit, we will have pitchers of water available for you to consume at will. Addtionally, after each study visit, you will have access to the dining area where snacks such as juice, granola bars, oatmeal, dried fruit, coffee, tea and hot cocoa will be available for you to consume.

Blood and sweat collected from you will be used to measure metabolites derived from normal biological processes which will include inflammatory mediators. Addtionally, blood and sweat collected from you during visit 4 will also be used to measure ibuprofen levels at each collection time.

What happens if I do not want to be in this research?

You may decide not to take part in the research and it will not be held against you.

What are my responsibilities if I take part in this research?

If you take part in this research, you will be responsible to:

1. NOT apply any cream or medication to your body 24 hours before you arrive for each study visit.
2. NOT consume any non-steroidal anti-inflammatory drugs such as aspirin, ibuprofen (Advil, Motrin, etc), acetaminophen (Tylenol) or naproxen (Aleve) for at least 48 hours before you arrive for each study visit.

3. Come to four study sessions, after a 12 hour overnight fast, lasting between one to five hours.
4. Bring or wear shorts to the first two study sessions.
5. Inform the research team if you experience any discomfort at any time during the study.

What happens if I say yes, but I change my mind later?

You can leave this research study at any time and it will not be held against you.

If you decide to leave the research, please contact the investigator so that the investigator can cancel your scheduled visit(s).

Data that has been collected during your time enrolled in the research study will be used for its intended purposes, when possible.

You will receive compensation for the portion of the study you do complete (see below).

Is there any way being in this study could be bad for me?

There is a small risk of loss of balance, dizziness, or shortness of breath and discomfort associated with an increase in heart rate, increased body temperature, and sweating that could result from a 15 min session on an exercise bicycle. Individuals with knee or hip pain, injuries, or weakness should not participate in this particular test. The session on the exercise bicycle is necessary to induce sweating by physiological methods, but may present additional risks to individuals in very poor cardiovascular health or with undiagnosed cardiovascular risk factors such as family history of heart disease, hypertension, high cholesterol, diabetes, harmful use of alcohol, tobacco use, stress, physical inactivity, obesity or an unhealthy diet. Before you perform the test we will evaluate your risk level by asking you questions about your health and symptoms related to heart disease. It is very important that you answer these questions as truthfully as possible to avoid serious adverse events. If our staff determines that you are in a high risk category, we will not do the test, and exclude you from the study. Potential cardiovascular-related serious adverse events include stroke and heart attack, which could result in death.

You will be asked to fast for 12 hours prior to, and during each of your study visit days. You may experience a headache, feelings of hunger or low energy as a result of fasting or lack of caffeine.

There is a small risk for bruising as a result of blood sample collection. During the blood drawing procedure, there is the possibility that you might experience some momentary pain or stinging sensations or bruising, or very rarely an infection around where the needle was inserted. However, blood will be taken only by experienced and licensed staff, and sterile methods will be used at all times.

The measurement of metabolic rate uses an air collection mask that fits snugly over the nose and mouth. This may create a feeling of claustrophobia in some individuals. Participants may request that the mask be readjusted or removed at any time.

There may be some risk with ibuprofen intake. In certain individuals ibuprofen has been known to cause an upset stomach including nausea, bloating and gas; diarrhea; constipation; headaches; dizziness; nervousness; itching skin or a rash; blurred vision or ringing ears.

During sweat collection, we will use a device that delivers pilocarpine to your skin using a mild electric current. The pilocarpine gel may cause some skin irritation such as redness or contact dermatitis. There is a very small risk of a burn from the device. The use of the device will also require pressing on your skin. If you bruise easily, you may develop a bruise at the location of the measurements although this would be unusual. However, this device is used frequently on infants for sweat collection.

There may also be risks to your privacy. The research team will limit the collection of personally identifying information on the study visit days and your forms will be identified only by a randomly generated participant identification code. The code, linked to your personal information, will be stored in a locked file in a locked and secure location. Your date of birth will only be used to calculate age and none of the data collected beyond the initial screening interview will be identified by your name. However, just like with other personal information kept by your health care providers, banks, and others, even these safeguards cannot guarantee absolute protection of the data. Although rare, there are reported cases of breaches that have resulted in discrimination in insurance or employment.

For more information about risks and side effects, contact the research study team.

Will being in this study help me in any way?

We cannot promise any benefits to you or others from your taking part in this research. The outcome of the research may lead to the development of better ways of analyzing the skin features of the human body.

What happens to the information collected for the research?

Efforts will be made to limit use or disclosure of your personal information (see description above), including research study and medical records, to people who have a need to review this information. We cannot promise complete confidentiality. Organizations that may inspect and copy your information include the IRB and other University of California representatives responsible for the management or oversight of this study. The Unites States Department of Agriculture (USDA), who sponsors this study, may have access to your participation records.

During your participation in this research, data will be collected about you. The de-identified data and any specimens, such as blood or tissue that are taken from you for this study, they will become the property of the University of California or USDA. The specimens may be used in this research, may be used in other research, and may be shared with other organizations. The specimens could lead to discoveries or inventions that may be of value to the University of California or to other organizations. Under state law you do not have any right to money or other compensation stemming from products that may be developed from the specimens.

If you agree that biological specimen(s) collected from you may be shared or used in other research, please initial here: _____

Otherwise, your specimen will be destroyed at the end of this study.

Federal law provides additional protections of your medical records and related health information. These are described in the UC Davis Health System Notice of Privacy Practices (http://www.ucdmc.ucdavis.edu/compliance/pdf/notice.pdf) and in an attached document..

Can I be removed from the research without my OK?

The person in charge of the research study or the sponsor can remove you from the research study without your approval. Possible reasons for removal include health risks, an inability to complete critical study components, lack of cooperation with study personnel, etc. We will tell you about any new information that may affect your health, welfare, or choice to stay in the research.

What else do I need to know?

There is no charge for you to participate in this study. Neither you nor your insurance carrier will be charged for your taking part in the research. All costs associated with the study will be paid by the sponsor/department.

It is important that you promptly tell the person in charge of the research if you believe that you have been injured because of taking part in this study. If you are injured as a result of being in this study, the University of California will provide necessary medical treatment. Depending on the circumstances, the costs of the treatment may be covered by University or the study sponsor or may be billed to your insurance company just like other medical costs. The University and the study sponsor do not normally provide any other form of compensation for injury. For more information about compensation, you may call the IRB Administration at (916) 703-9151 or email at HS-IRBAdmin@ucdavis.edu.

If you agree to take part in this research study, we will compensate you by check for up to $75, if you complete all aspects of the study, for your time and effort. Should you choose to withdraw from the study or are unable to complete all procedures, your compensation will be pro-rated to reflect your time and effort contributed. The rate of pay offered is scheduled as follows:

Visit	**Hours**	**Compensation**
Study Visit 1	2	$10.00
Study Visit 2	1	$10.00
Study Visit 3	1	$10.00

Study Visit 4	5	$45.00
Total	**Approximately 9**	**$75.00**

You may be asked for your social security number for payment purposes. It will not be used for any other purpose without your permission

The results of this study, including specimens collected, may have commercial value to the sponsors, UC Davis, and/or the researchers. You will have no legal or financial interest in any commercial development resulting from the research or from the information or materials collected.

Are there other research opportunities?

If you are interested in being contacted for future research, please provide your phone number and/or email. This is completely optional.

_____(initials) Yes, I am willing to be contacted for future research opportunities. My phone number and/or email is: _____.

Your signature documents your permission to take part in this research.

Signature of subject	Date
Printed name of subject	
Signature of person obtaining consent	Date
Printed name of person obtaining consent	

APPROVED by the Institutional Review Board at the University of California, Davis	
Protocol	APPROVED
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