Consent to Participate in Research for
Evaluating the Technology and Assessing the Biological Effects of Commercially Available PhotoBioModulation Devices

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1. KEY INFORMATION

Photobiomodulation therapy (PBMT) is a non-invasive (occurring outside of the body) procedure that involves applying certain forms of light to the body to enhance performance, stimulate healing, modulate recovery, and improve general wellness. The purpose of this research is to evaluate the effects of whole body PBMT application using light emitting diodes (LEDs) on general wellness.

If you choose to participate, you will be enrolled in this study for approximately 8 weeks. While you are in the study, you will be asked to: complete questionnaires, body composition testing, provide saliva and blood samples, wear an Oura Ring to continuously monitor your sleep quality, heart rate, blood oxygen levels, and activity. You will be randomly assigned to 1 of 2 treatment groups, either:
1) high-power PBMT, or
2) low-power PBMT.

Once randomized to a treatment group, you will be randomized to a treatment schedule, either:
1) active PBMT treatment during Part 1 and sham (placebo) PBMT during Part 2, or
2) sham-PBMT during Part 1 and active PBMT during Part 2.

This is a single-blind study, which means you will not know which treatment group or treatment schedule you are assigned to until you complete the study.

The main risks associated with PBMT include discomfort from skin tissue heating and possible eye damage if appropriate eye protection is not worn. Sensations such as warmth, tingling, fatigue, and increased pain have been reported by patients within the 24-hour period following treatment. Steps to minimize these risks are described later in this consent form. It is possible that you may benefit from this research by experiencing improvement in general wellness. However, we cannot guarantee that you will directly benefit from your participation in this study.

Prior to receiving this consent form, you should have been screened by a researcher for eligibility. If you have not been screened, please do not sign this document and notify the researcher. If your eligibility status changes at any point during this study, you must notify a researcher and immediately discontinue participation. Circumstances affecting eligibility could include (but are not limited to): receiving a new diagnosis included in the list of excluded medical conditions, starting a new medication included in the list of excluded medications, etc.. Should you have any concerns, the full list of exclusionary criteria you reviewed with the researcher will be provided to you upon request.

The alternative is to not participate in this study. Your participation is completely voluntary, and you may withdraw from the study at any point.

Your research data and biospecimens will be identified by a unique coded study/sample ID and not by your personally identifiable information (PII) (e.g., name, DOD ID, or other protected identifier). The research team will maintain a confidential electronic master list that matches your unique coded study number with your PII. The master list will be destroyed at study closure. Once the master list is destroyed, all coded research data and biospecimens will be de-identified. The de-identified electronic research data will be maintained indefinitely. You will be given the option to consent to long-term storage and future use of your de-identified biospecimens.

The information that we obtain from you for this study might be used for future studies. We may remove anything that might identify you from the information and specimens. If we do so, that information and specimens may then be used for future research studies or given to another investigator without getting additional permission from you.

Complete confidentiality cannot be promised, in particular for military personnel, whose health or fitness for duty information may be required to be reported to appropriate medical or command authorities. If such information is to be reported, you will be informed of what is being reported and the reason for the report.

2. PURPOSE

You are being asked to take part in this research study because you are either an active-duty service member, government civilian, or a government contractor, and you are between the ages of 18-45 (inclusive) years. The purpose of this research study is to determine the effects of whole body PBMT application on general wellness using light beds versus sham treatments, and light beds at different power intensities. This study is a single-blind randomized controlled trial, in which you will be randomized to a treatment group, either (1) high-power, or (2) low-power PBMT, and you will be randomized to a treatment schedule, either (1) active PBMT in Part 1 and sham-PBMT in Part 2, or (2) sham-PBMT in Part 1 and active PBMT in Part 2. Randomization is a process like flipping a coin and means you will have a 50% chance of being assigned to either of the treatment groups, and a 50% change of being assigned to either of the treatment schedules. This research study is a single blind study, which means that you will not know whether you are receiving the research study active treatment or a placebo, until after study completion at your final follow-up visit.

There will be about 150 people taking part in the study at the Air Force Research Laboratory (AFRL).

The PBMT devices that are being used in this study are commercially available PBMT light beds that will be used to deliver the study intervention. The low-power PBMT bed that will be used is the NovoTHOR Whole Body Light Pod XL, and the high-power beds will be either the TheraLight 360+ or the ARRC LED ATP RF. All of these devices are registered with the U.S. Food and Drug Administration (FDA) and have been designated as class II medical devices that are exempt from 510k requirements. Class II medical devices are defined by the FDA as medical devices that pose moderate to high risk and that are subject to general controls (baseline requirements that are applicable to all medical devices) as well as special controls (requirements that provide reasonable assurance for the safety and effectiveness of the device). A 510k is a premarket submission made to

the FDA that demonstrates that the device is safe, effective, and substantially equivalent to a legally marketed device. However, an exemption from 510k requirements is granted when the FDA finds that additional information provided in a 510k submission is not necessary in order to reasonably assure the safety and effectiveness of the device for the device type. One other example of exempt class II medical devices is hearing aids.

3. PROCEDURES

If you agree to participate in this study, you will be asked to complete the following procedures:

Baseline Data Collection (Week 0-1):

- Complete a brief intake form to collect your contact information and a demographics questionnaire which will include questions relating to personal demography, military and employment demography, injury demography, and study-specific demography.
- Complete baseline measurements including assessment of your skin phototype, body composition testing, and blood pressure testing.
  - Please note, body composition results will be used as formal screening criteria to determine your eligibility to participate in this study. If your body fat composition is greater than or equal to 40%, you will be formally removed from the study and ineligible to continue with study procedures.
- Wear an Oura Ring for the duration of the study (8 weeks). The Oura Ring will continuously measure sleep quality, heart rate, blood oxygen levels (SpO2), and activity. This data will be collected manually by study personnel on a weekly basis.
  - You will be asked to wear the Oura Ring for 1 week of baseline data collection prior to receiving your study treatment.
  - You will need to charge your ring every 4-5 days. The app will remind you when your ring needs to be charged. Charging the ring takes 60-80 minutes.
  - You will be asked to download the Oura Ring device application onto your personal device, or you may be provided with a study iPad to use the device application. A study team member will provide you with your individual login information to access the user portal.

Randomization:

You will be randomly assigned to 1 of 2 treatment groups, either:

1) high-power PBMT (using either the TheraLight 360+ or the ARRC LED ATP RF), or
2) low-power PBMT (using the NovoTHOR Whole Body Light Pod XL).

Once randomized to a treatment group, you will be randomized to a treatment schedule, either:

1) active PBMT treatment during Part 1 and sham (placebo) PBMT during Part 2, or
2) sham-PBMT during Part 1 and active PBMT during Part 2.

Randomization is a process like flipping a coin and means you will have a 50% chance of being assigned to either of the treatment groups and either of the treatment schedules.

All participants will have a treatment schedule with a placebo group in either Part 1 or Part 2. A placebo is an inactive, harmless intervention, that looks like the active research study intervention,

but contains no active treatment. In this study, the placebo is the sham-PBMT, which is an inactive treatment that is intended to mimic the PBMT treatment.

This research study is a single blind study, which means that you will not know which treatment group or treatment schedule you were assigned to until after study completion at your final follow-up visit.

Study Treatment:
All treatment sessions will take place in an enclosed space at the STRONG-PHOTON Lab in E200L. You will be asked to refrain from using perfumes, plant extracts (e.g., St John's Wort), oils, and lotions in the treatment areas, as this use can increase photosensitivity. You will be asked to refrain from using non-steroidal anti-inflammatory drugs (NSAIDs), like aspirin, during the study. You will be asked to remove face makeup, clothing, prescription glasses, and any jewelry that may come into contact with the light bed prior to the procedure. You will have a private partitioned area to remove your clothing and enter the light bed. If you are not comfortable being nude, you may retain up to 10% of your clothing. The researchers will never enter the private treatment area while it is in use. You will be provided with light filtering goggles, noise-cancelling headphones, and a Polar Team Pro heart rate monitor (a light-weight chest strap) to wear during the treatment sessions. Prior to the first treatment you will have an opportunity to request that only same-sex study personnel are present during your treatment. All such requests will be granted and treated as a mandatory condition of your participation.

Part 1 (Weeks 2-4):
Treatment sessions will be 15-60 minutes and will occur 3 times a week for 3 weeks.

Washout (Week 5):
You will complete a 1-week wash-out period before you begin receiving Part 2 study treatment. During the washout period you will continue daily study procedures, including questionnaires, saliva collection, and wearing the Oura Ring.

Part 2 (Weeks 6-8):
Treatment sessions will be 15-60 minutes and will occur 3 times a week for 3 weeks.

Follow-Up Data Collection:
- *Daily* - Complete pain questionnaire, end of day questionnaire, morning wellness, wear the Oura Ring, and provide a saliva sample (weekdays only)
- *Weekly* – Complete athletic mental energy scale and fatigue questionnaires
- *Pre/Post-Study Treatment Sessions* - Answer brief session questionaries
- *Pre/Post-Study Intervention Block (i.e., Part 1 and Part 2)* - Complete questionnaires and blood draws at the beginning and end of treatment blocks (for a total of five blood draws throughout the study).

Your participation in this study will end after you complete the final follow-up visit. You will be asked to return all study devices and you will be unblinded to the treatment group and treatment schedule that you were assigned to.

4. POTENTIAL RISKS/DISCOMFORTS

If you choose to take part in this study, there are risks associated with the study procedures:

- Photobiomodulation Therapy (PBMT):
  The risks associated with PBMT are minimal. PBMT is used by a variety of healthcare practitioners for painful clinical conditions. Mild discomfort may be experienced during the treatment, the treatment should not be "hot", but participants should notify the study team member if they feel any uncomfortable warming. Individuals with neuropathies or difficulty distinguishing changes in skin temperature are at higher risk. Potential research-related risks include damage to eye structures, headaches post-procedure, uncomfortable skin heating or erythema/redness, which are both very rare.

- Blood Draw/Venipuncture:
  There are also common but minor risks associated with blood draws. These potential risks include: discomfort, bruising, hematoma, redness, swelling, light-headedness, fainting, nerve damage and, rarely, infection.

- Oura Ring:
  There are no known risks of regular wear of the Oura ring. You should remove the Oura ring during any activities that may cause pinching of the skin such as lifting weights, doing yard work, or any other activity that may cause discomfort. If you experience redness or skin irritation on your finger, wrist, or chest due to the devices, remove them immediately and let the research team know so that they can determine next steps. Avoid working with batteries such as a car battery when wearing the Oura ring. In certain cases, where both the cathode and the anode of another battery touch the ring, there is a risk of a short circuit, which is similar to standard metallic rings and could result in a dangerous shock.

- Confidentiality:
  Any time information is collected for a study, there is a small risk of breach of confidentiality. Although efforts are made to protect your research study records, there is always a risk that someone could get access to the personal information researchers have stored about you.

There may also be other risks of taking part in this study that we do not yet know about.

Incidental Findings:
There is a possibility that while reviewing your test results we may see an abnormality that we did not expect to see in this study. This is what is called an "incidental finding." We will let you know if we see such an incidental finding. Depending on the type of incidental finding, we may contact you by phone. In the case of a potential serious emergency, the researcher will inform you right away. Research representatives will not share incidental and unexpected findings with anyone else unless required by law.

In cases involving military personnel, information regarding your health may be required to be reported to appropriate medical or command authorities to ensure the proper execution of the military mission, including evaluation of fitness for duty.

5. PREGNANCY RISKS

Safety of PBMT in pregnant women has not been established, so, the risks to pregnant women are unknown. It is not known whether PBMT can cause birth defects or other problems in an unborn child.

If you are a biological female of child-bearing age and/or capacity, you will be asked to attest to your pregnancy status upon enrollment in this study. This research excludes individuals that are, or are trying to become, pregnant. If you become pregnant or feel you might be pregnant, contact your personal physician and the Principal Investigator of this study. If you are determined to be ineligible due to your pregnancy status, you will be formally withdrawn from the study and you will not be eligible to continue with study procedures and treatment.

6. BENEFITS

It is possible that you may benefit from this research by experiencing improvement in general wellness. However, we cannot guarantee that you will directly benefit from your participation in this study.

7. COSTS

There will be no cost to you for the research study related visits, lab tests, and study procedures. You will be asked to sign a hand-receipt for an Oura Ring which indicates the transference of ownership for the duration of the study. Should the Oura Ring become lost or damaged outside of normal wear-and-tear, you will be responsible for replacing the device; the price to replace this device is approximately $300.00. You will be responsible for your transportation to and from the study.

8. ALTERNATIVES TO PARTICIPATION

Your alternative is to choose not to participate in this research study. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may likewise discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. You must notify one of the investigators of this study to discontinue your participation.

9. YOUR PARTICIPATION IS VOLUNTARY/SIGNIFICANT NEW FINDINGS

The decision to participate in this research is voluntary on your part. No one may coerce or intimidate you into participating. Participate only if you want to. Jason Eckerle, or an associate, should adequately answer all questions you have about this study, your participation and the procedures involved. If you have any further questions, Jason Eckerle can be reached at (937) 938-3596. Jason Eckerle, or an associate, will be available to answer any questions concerning procedures throughout this study. You may withdraw from this research study at any time without penalty.

If significant new findings develop during the course of this research, which may relate to your decision to continue participating or may affect the risk involved, you will be informed.

Additionally, the investigator of this study may terminate your participation in the study if she or he thinks that would be in your best interest. If you have any questions or concerns about your participation in this study, or your rights as a research subject, please contact the Air Force Research Laboratory Institutional Review Board (AFRL IRB) at AFRL.IR.ProtocolManagement@us.af.mil. An IRB, also called an ethics committee, is an independent committee that has reviewed this study to protect the rights and welfare of human research participants.

10. COMPENSATION

There are five opportunities to receive compensation:
(1) when a participant completes the first blood draw - $50,
(2) when a participant completes the second blood draw - $50,
(3) when a participant completes the third blood draw - $50,
(4) when a participant completes the fourth blood draw - $50
(5) when a participant completes the fifth blood draw - $50

Participants will only be paid for applicable research activities that they complete. You will not receive compensation for research activities you do not complete.

Greenphire will act as an agent of The Geneva Foundation to manage the payments for your participation. You will be issued a Greenphire ClinCard card which is a visa debit card that your funds are loaded onto. When a study visit is completed, funds will be approved and loaded onto your card. The funds will be available within approximately 2-5 business days and can be used at your discretion. You will be issued one card for the duration of your participation. If your card is lost, the site can replace it for you-once at no cost. The card will expire within 3 years of distribution.

Payment received as compensation for participation in research is considered taxable income. If your payments exceed $600 in any one calendar year, The Geneva Foundation will file a 1099 (Miscellaneous Income) form. The Geneva Foundation will need to collect certain information about you, on a W-9 including: name, address, date of birth and Social Security Number. All information is stored in a secure fashion.

In accordance with the DoDI 3216.02, all human subjects (including federal employees both on and off-duty) participating in DoD-conducted or supported research may be compensated up to $50 for each blood draw.

There are no plans to provide other compensation beyond that described in this informed consent document.

If you are compensated as a participant in research, the IRS requires this compensation to be reported on tax returns.

11. RESEARCH-RELATED INJURY

In the event of a mishap, an AF Form 978, Supervisor Mishap Report, will be completed by the injured government personnel's supervisor, or the supervisor of the damaged government property,

and returned to the appropriate government safety office within five (5) workdays following the mishap.

Your entitlements to medical and dental care and/or compensation in the event of injury are governed by federal laws and regulations. In the event of a research related injury, you may contact the Principal Investigator of this research study Jason Eckerle at (937) 938-3596.

If an unanticipated event occurs during your participation in this study, you will be informed. If you are not competent at the time to understand the nature of the event, such information will be brought to the attention of your next of kin or other listed emergency contact.

Emergency Contact Name	**Phone Number**

12. DATA MANAGEMENT/CONFIDENTIALITY

Records of your participation in this study may only be disclosed according to Federal law, including the Federal Privacy Act, 5 U.S.C. 552a, the Health Insurance Portability and Accountability Act (HIPAA), and the Freedom of Information Act, 5 U.S.C. Sec 552, and their implementing regulations when applicable.

Organizations that may look at and/or copy research records for research oversight, quality assurance and data analysis:

- the research study team members
- the Air Force Research Laboratory IRB
- the Department of the Air Force Component Office of Human Research Protections
- the Department of Defense Office for Human Research Protections
- the Department of Defense
- the coordinating center, Musculoskeletal Injury Rehabilitation Research for Operational Readiness (MIRROR), based out of the Department of Physical Medicine & Rehabilitation (PM&R) at the Uniformed Services University (USU)
- the collaborators from Uniformed Services University (USU)
- the collaborators from Ohio State University (OSU)

Procedures to protect the confidentiality of the data in this study include but are not limited to:

- Your research data will be identified only by a unique coded study ID and not by your name, DoD ID, or other protected identifier. Only the research staff will have access to the file which links your PII with the study ID number. This file will be a password protected document on a computer and network that requires verified access and will only be accessible by local research staff.

- All paper research records will be stored in a locked cabinet inside of a locked room accessible only by authorized staff.

- Your coded study data will be entered into Smartabase. Smartabase is a cloud-based data management software system. In addition to the software's standard data security measures, Smartabase established an isolated server for all 711 Human Performance Wing (HPW) data that is maintained by a government contractor. Smartabase will serve as the central repository for all collected human performance/biometric data. No PII will be entered into Smartabase.

- Your coded electronic study data will be securely shared with Musculoskeletal Injury Rehabilitation Research for Operational Readiness (MIRROR), which is based out of the Department of Physical Medicine & Rehabilitation (PM&R) at Uniformed Services University (USU), and is serving as a Coordinating Center for this study. Your coded study data will be stored in Research Electronic Data Capture (REDCap), a secure, access controlled, and password protected electronic data capture and management system housed on a DoD server and maintained by USU IT in Bethesda, MD. No PII will be entered into REDCap.

- Your coded electronic study data will be securely sent to collaborators at Ohio State University (OSU) for data analysis. Data will be processed and stored on encrypted OSU servers or password protected OSU computers able to process and store research data. Only the research team will have access to the study electronic coded data. Data will used for the research purposes described in the protocol and will not be shared outside of the research team.

- The storage procedures to protect the confidentiality of your biospecimens include: removing direct identifiers from specimen samples, coding your specimen with a unique sample ID during the course of this study, ensuring de-identification of specimen at study closure, and ensuring the destruction of specimen at the conclusion of analyses or until the samples have been used up (whichever comes first).

Informed Consent Forms will be maintained for a period of 6 years following study closure and then securely shredded. Paper research forms will be maintained for a period of 5 years following study closure and then securely shredded. The master list connecting unique study IDs to participant identifiers will be destroyed at study closure. The electronic coded research data will be maintained indefinitely.

Future Use of Information:

The investigators have requested to save selected data collected from your participation in this research study for possible use in future research. We may remove anything that might identify you from the information. If we do so, that information may then be used for future research studies or given to another investigator without getting additional permission from you. This future research may be in the same area as the original study or it may be for a different kind of study.

If you consent to participate in this research study, your de-identified data, meaning that all of your personal identifiers have been removed, collected as part of this research may be kept for future research studies or given to others for future approved research studies. ****If you would NOT like your de-identified data collected as part of this research to be kept for possible future research, you should not consent to participate in this research study.****

Your de-identified research data will be securely sent to Musculoskeletal Injury Rehabilitation Research for Operational Readiness (MIRROR) and stored at the Uniformed Services University (USU) alongside other de-identified research data. Your de-identified research data will also be securely sent to collaborators at Ohio State University (OSU). This de-identified research data will be kept indefinitely, or as long as it is practical to maintain, and may be used in future research studies.

Any future research using your retained data will require a research protocol for the proposed study reviewed and approved by an Institutional Review Board (IRB) (a committee responsible for protecting research participants), an Exempt Determination Official (EDO), or other authorized official responsible for protecting human subjects of research. The data protections for privacy and confidentiality described in this consent form will apply to any future use of your stored data.

Future Use of De-Identified Biological Specimens:
The investigators in this study are asking for your permission to store your de-identified samples for future use in other research studies. The specifics of these future research studies are unknown at this time. You will be provided choices at the end of this consent form to either allow or deny the use of your de-identified biospecimens in future research studies.

Your de-identified samples will be stored using a unique sample ID.

While this study is ongoing and the master list exists, your specimen will be coded; this is considered identifying information and can be traced back to you as the donor. When the master list is destroyed at study closure, your specimen will then become de-identified and will no longer be able to be traced back to you as the donor.

Your samples could be stored indefinitely, or until none is left to use.

Your samples will be handled in accordance with this study's protocol and applicable regulations at the following laboratory: Werner Lab, B3010, Neurology Department, Uniformed Services University, 4301 Jones Bridge Rd., Bethesda, MD 20814. The study PI will maintain responsibility for the storage of specimens. Investigators requesting portions of your samples for future research must have the approval of the PI and must have a research protocol for their newly proposed research study approved by an Institutional Review Board (IRB) (a committee responsible for protecting research participants). It is possible these other researchers will request approval from an IRB to contact you in the future.

Generally, you will not be provided with the results of future studies using your samples from this bank. This is typically the case because the research results at that early point will not have a clear meaning for or direct clinical benefit to you.

You may request that your specimens be withdrawn from storage at any time while the specimens are still coded. Once your specimens have been de-identified, it will be impossible for the researchers to locate your specific specimens. if you decide you no longer want to take part, you will need to notify the study PI.

Your biospecimens (even if identifiers are removed) may be used for commercial profit. You will not share in this commercial profit.

13. STUDY PARTICIPATION AGREEMENT/CONSENT

Taking part in this research study is completely voluntary. Your signature below indicates:

- You agree to be in this study.
- The researcher has explained the study and you have read and understand the information you have been given.
- You were given the opportunity to ask questions and all of your questions have been answered to your satisfaction.
- You understand that signing this consent does not take away any of your legal rights.

You will be given a copy of this consent form for your records upon request.

FUTURE USE OF BIOSPECIMENS:
Please initial the sentences that reflect your choices, and then sign below:

_____ I DO NOT authorize the storage of my de-identified biological specimens for future use in research studies.

_____ I DO authorize the storage of my de-identified biological specimens for future use in research studies.

Volunteer Signature	**Printed Name**	**Date**

Investigator Signature	**Printed Name**	**Date**

Privacy Statement

Authority: 32 CFR 219, 45 CFR Part 46

Purpose: Your identifiable information is being collected so that we can obtain sufficient contact information in order to locate/contact you during your study participation.

Routine Uses: Your identifiable information will not be disclosed outside of the DoD. Information may be disclosed for any of the DoD Blanket Routine Uses.

Disclosure: Disclosure of the requested information is voluntary. No adverse action whatsoever will be taken against you, and no privilege will be denied if you do not disclose this information. However, your participation in this study may be impacted by a refusal to provide this information.