Opportunity Title: High-School Student Summer Internship in Biophoton Emission at the Air Force Research Laboratory (AFRL)
Opportunity Reference Code: AFRL-711HPW-2022-0002

Organization U.S. Department of Defense (DOD)

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How to Apply Click on *Apply* at the bottom of the opportunity to start your application.

Application Deadline 5/30/2022 11:59:59 PM Eastern Time Zone

Description The Air Force Research Laboratory (AFRL) is offering internships for high-school students at Wright State University.

What will I be doing?

As an ORISE participant, you will join a community of scientists and researchers studying the relationship between cellular signaling and intracellular photonic emission.

Cell-to-cell communication is important for the proper function of biological systems. Different molecules are traditionally seen as information carriers activating pathways and eliciting cellular responses but there is emerging evidence of cellular communication by light as a form of non-molecular information transfer in many organisms. Almost all life spontaneously emits weak photon emissions as part of chemical reactions taking place inside each cell during normal or stressed conditions, known as ultra-weak photon emission (UPE) or biophoton emission. Despite a century of research, little is known about the specific mechanisms of biophoton generation and reception as well as the information encoded in biophoton signaling. Therefore, the goal of this research is to understand the relationship between cellular signaling and intracellular photonic emission. Compared to chemical and electrical forms of cell communication, our knowledge of cellular signaling through cell-based photons is primitive. The significance, mechanisms for photon generation and detection, and quantification of spectra, intensity, and spatial and temporal distribution are important features of this phenomenon that require further investigation.

Why should I apply?

As the selected participant for this project, you gain experience examining the fundamental aspects of photon generation and photon absorption by cells under the guidance of a mentor. You will gain hands-on experience to complement your education and support your academic and professional goals. Your research experience will be based on your education and training and may include:

- Designing and planning experiments
- Cell culture and maintenance
- Carrying out test/experimental procedures
- Analyzing data

Where will I be located?

Dayton, Ohio

What is the anticipated start date?

June 2022. Exact start dates will be determined at the time of selection and in coordination with the selected candidate. Applications are reviewed on an ongoing basis and internships will be filled as qualified candidates are identified.

What is the appointment length?

This appointment is a summer (10 week) research appointment, with the possibility to be renewed for additional research periods. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant.

What are the benefits?

You will receive a stipend to be determined by AFRL. Stipends are typically based on a participant's academic standing, discipline, experience, and research facility location. Other benefits may include the following:

- Health Insurance Supplement (*Participants are eligible to purchase health insurance through ORISE)*
- Relocation Allowance
- Training and Travel Allowance

About AFRL

AFRL leads the discovery, development and integration of affordable warfighting technologies for America's air, space and cyberspace forces. AFRL is a full-spectrum laboratory, responsible for planning and executing the Air Force's science and technology program. AFRL leads a worldwide government, industry and academic partnership in the discovery, development and delivery of a wide range of revolutionary technologies. The laboratory provides leading edge warfighting capabilities keeping our air, space and cyberspace forces the world's best. The 711 Human Performance Wing (711 HPW) advances human performance in air, space and cyberspace through research, education and consultation, accomplished through the synergies created by the wing's two distinct but complementary entities: Airman Systems Directorate and U.S. Air Force School of Aerospace Medicine. For more information about AFRL and the 711 HPW, please visit https://www.wpafb.af.mil/afrl/711hpw/.

About ORISE

This program, administered by Oak Ridge Associated Universities (ORAU) through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and DoD. Participants do not enter into an employee/employer relationship with ORISE, ORAU, DoD or any other office or agency. Instead, you will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE. For more information, visit the ORISE

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Research Participation Program at the U.S. Department of Defense.

Qualifications

The qualified candidate should currently be pursuing a high-school diploma/GED. Those candidates who expect to receive a high-school diploma/GED by May 31, 2022, are also eligible to apply.

Highly competitive applicants will have education and/or experience in one or more of the following:

- Sound understanding of safe laboratory practices, physics, optics, biology, or a related discipline.

Application Requirements

A complete application consists of:

- Zintellect Profile
- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- Transcripts/Academic Records - For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. Click here for detailed information about acceptable transcripts.
- One Recommendation

If you have questions, send an email to AIRFORCE@orise.orau.gov. Please list the reference code of this opportunity [AFRL-711HPW-2022-0002] in the subject line of the email. Please understand that ORISE does not review applications or select applicants; selections are made by the sponsoring agency identified on this opportunity. All application materials should be submitted via the “Apply” button at the bottom of this opportunity listing. Please do not send application materials to the email address above.

Connect with ORISE...on the GO! Download the new ORISE GO mobile app in the Apple App Store or Google Play Store to help you stay engaged, connected, and informed during your ORISE experience and beyond!

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Currently pursuing a High School Diploma/GED.
- **Discipline(s):**
  - **Life Health and Medical Sciences** (5 👁)
  - **Physics** (3 👁)