

**Opportunity Title:** Corticosteroid Eluting Endotracheal Tube to Mitigate Airway Inflammation Associated with COVID-19

**Opportunity Reference Code:** DHA-JBSA-2021-0001

**Organization** U.S. Department of Defense (DOD)

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**How to Apply** Components of the online application are as follows:

- Profile Information
- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- Transcripts/Academic Records
- Recommendation

Submitted documents must have all social security numbers, student identification numbers, and/or dates of birth removed (blacked out, blackened out, made illegible, etc.) prior to uploading into the application system.

If you have questions, send an email to [stem-workforce@orise.orau.gov](mailto:stem-workforce@orise.orau.gov). Please list the reference code of this opportunity in the subject line of the email.

All documents must be in English or include an official English translation.

**Description** The Physician Scientist Program (PSION) is located in the Army Institute of Surgical Research at Fort Sam Houston, TX. The research team includes active duty emergency medicine physicians, scientists, research coordinators, and a program manager. The center conducts research related to the en route care of combat casualties from point of injury to and between medical treatment facilities.

The ORISE participant will learn from military and civilian researchers and clinicians at the USAISR, SAMMC, and outside university collaborators. Under the guidance of a mentor, the participant will take part in the facilitation of integrated, complementary and inter-disciplinary approaches to combat casualty care and address programmatic, procedural and regulatory research. Specific research related to the development and validation of airway management devices, will be conducted to determine the ability to monitor clinical resuscitation and interventions.

As part of a collaborative team between the University of Texas at San Antonio (UTSA) Biomedical Engineering Department, 59MDW Office of the Chief Scientist, and the Battlefield Health & Trauma Center Dental and Craniofacial Research Department at the US Army Institute of Surgical Research led by MAJ Gregory Dion, MD, MS, the ORISE Masters-level scientist will work closely across partnering institutions to execute and complete task related to the funded project to employ a polymer-mesh coated endotracheal tube to deliver traditional corticosteroid treatment (dexamethasone), targeted antifibrotic siRNA molecules (anti-SMAD3), valacyclovir, and Roxadustat (FG-4592) and compare wound healing and drug delivery.

In collaboration with the the Principal Investigator (PI) in execution of above listed study, activities will include, but not limited to:

1. Collecting study results, endoscopic images, statistical analyses, and sample storage/location.
2. Attend and actively participate in weekly lab meeting with PI (virtual or in-person).
3. Participate with writing/preparing necessary monthly, quarterly, and annual/final project reports and documents in addition to any necessary purchasing requests, manuscripts, and/or presentations.



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4. Perform / participate in electrospinning and drug loading pharmacokinetic testing of polymer endotracheal tubes.
5. Perform / participate in drug elution loading response curves for fiber mesh thickness and drug delivery doses for all included drug targets.
6. Perform / participate in and/or oversee assessing bioactivity of eluted drugs compared to standard biological benchmarks.
7. Perform / participate in stability and degradation of drug coating over time in vitro.
8. Assist with collection of clinical samples performed at a vivarium, maintaining study database and study data linking specimens, exposure time, and outcome data. Assist with animal surgeries as required.
9. Perform / participate in scanning electron microscopy (SEM) of all explanted stents.
10. Perform / participate in biomechanical testing of explanted tissue specimens.
11. Assist with whole genome microbiome sequencing of collected samples.
12. Assist with coordination of histological slide preparation, interpretation, and associated assays to include IL-17 assessment among others.

*Desired Appointment Start Date: 3/1/2021*

#### **Appointment Length**

This appointment is a six month 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.

#### **Participant Benefits**

Participants will receive a stipend to be determined by DHA. Stipends are typically based on the 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

#### **Nature of Appointment**

The participant will not enter into an employee/employer relationship with ORISE, ORAU, DOD, or any other office or agency. Instead, the participant will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment.

While participants will not enter into an employment relationship with DOD or any other agency, this opportunity will require a suitability investigation/background investigation. Any offer made is considered tentative pending favorable outcome of the investigation.

- Qualifications**
- Actively in a Masters Program in Biomedical Engineering or closely related discipline graduating December 2020 or sooner with such a degree.
  - Display knowledge and competency point of injury models
  - Have practical and functional knowledge of experimental study scaffold vascularization
  - Have bench skills including proficiency in cell culture, tensile testing and biomechanical testing

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and analysis strategies

- Familiarity with SolidWorks, MATLAB, Mimics-3D Medical Imaging Software, and CT-based finite element analysis

- Have excellent independence and communication skills

**Eligibility** • **Citizenship:** LPR or U.S. Citizen

**Requirements** • **Degree:** Master's Degree received within the last 60 months or anticipated to be received by 12/20/2020 12:00:00 AM.

• **Discipline(s):**

- **Chemistry and Materials Sciences** ([12](#))
- **Communications and Graphics Design** ([2](#))
- **Computer, Information, and Data Sciences** ([16](#))
- **Earth and Geosciences** ([21](#))
- **Engineering** ([27](#))
- **Environmental and Marine Sciences** ([14](#))
- **Life Health and Medical Sciences** ([45](#))
- **Mathematics and Statistics** ([10](#))
- **Other Non-Science & Engineering** ([2](#))
- **Physics** ([16](#))
- **Science & Engineering-related** ([1](#))
- **Social and Behavioral Sciences** ([27](#))