Opportunity Title: Biomaterials integration and processing
Opportunity Reference Code: ARL-R-WMRD-300087

Organization DEVCOM Army Research Laboratory

Reference Code ARL-R-WMRD-300087

Description **About the Research**

Located at Aberdeen Proving Ground in Maryland, the U.S. Army Research Laboratory (ARL) is the Army's central laboratory. Its diverse assortment of unique facilities and dedicated workforce of government and private sector partners make up the largest source of world-class integrated research and analysis in the Army.

The candidate will be conducting research at the intersection of Materials Science and Synthetic Biology, providing support for interdisciplinary research to integrate novel materials employing an array of processing techniques. The research fellowship will provide experience in the handling of both organic and inorganic materials produced through biological means, and may involve isolation or purification of these materials. Extensive experience with characterization techniques will also be gained, ranging from thermal analysis (e.g. DMA, TGA, DSC), spectroscopy (UV-Vis, FTIR, Raman), and microscopy (optical, SEM, AFM). In addition, the candidate will assist with composite preparation, employing an array of materials processing techniques(film casting, extrusion, dip or spray-coating). Initial targets of the program will explore the use of bio-templated inorganic filler materials in a thin layer structure that will be
evaluated for its performance for use in a conformal antenna assembly. These coupon-level tests will provide insight into the preparation and assembly of the fillers, and provide a platform to explore the use of specific vs. non-specific binding motifs to control inorganic filler assembly. Future areas of exploration are likely to include the evaluation of novel organic particulates or dyes for application in coatings or thin films. One aspect ripe for exploration is establishing the stability of the dyes or particles under simulated use conditions, including the impact of UV or other environmental challenges.

The candidate must have a bachelors degree in molecular biology, biochemistry, microbiology, materials science, or related field and should have two or more years of laboratory experience. For this research opportunity it is expected that the fellow will improve upon the skills they already have but also will develop new skills as they work with the team and embrace the multidisciplinary nature of the program. Good laboratory practices including maintaining a detailed laboratory notebook, following Standard Operating Procedures, following all safety rules are a must for this opportunity.

This opportunity is open to U.S. Citizens only.

ARL Advisor: Joshua A. Orlicki

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ARL Advisor Email: joshua.a.orlicki.civ@mail.mil

About WMRD

The goals of the Weapons and Materials Research Directorate (WMRD) are to enhance the lethality and survivability of weapons systems, and to meet the soldier's technology needs for advanced weaponry and protection. Research is pursued in energetic materials dynamics, propulsion/flight physics, projectile warhead mechanics, terminal effects phenomena, armor/survivability technologies, environmental chemistry, and advanced materials (energetic, metals, ceramics, polymers, composite/hybrids, and mechanics) for armor, armament, missiles, ground vehicles, helicopters, and individual soldier applications necessary for maintaining and ensuring supremacy in future land warfare.

About ARL-RAP

The Army Research Laboratory Research Associateship Program (ARL-RAP) is designed to significantly increase the involvement of creative and highly trained scientists and engineers from academia and industry in scientific and technical areas of interest and relevance to the Army. Scientists and Engineers at the CCDC Army Research Laboratory (ARL) help shape and execute the Army's program for meeting the challenge of developing technologies that will support Army forces in meeting future operational needs by pursuing scientific research and technological developments in diverse fields such as: applied mathematics, atmospheric characterization, simulation and human modeling, digital/optical signal processing, nanotechnology, material science and technology, multifunctional technology, combustion processes, propulsion and flight physics, communication and networking, and computational and information sciences.

A complete application includes:

- **Curriculum Vitae or Resume**
- **Three References Forms**
  - An email with a link to the reference form will be available in Zintellect to the applicant upon completion of the on-line application. Please send this email to persons you have selected to complete a reference.
  - References should be from persons familiar with your educational and professional qualifications (include your thesis or dissertation advisor, if applicable)
- **Transcripts**
  - Transcript verifying receipt of degree must be submitted with the application. Student/unofficial copy is acceptable

If selected by an advisor the participant will also be required to write a **research proposal** to submit to the ARL-RAP review panel for :

- Research topic should relate to a specific opportunity at ARL (see Research Areas)

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- The objective of the research topic should be clear and have a defined outcome
- Explain the direction you plan to pursue
- Include expected period for completing the study
- Include a brief background such as preparation and motivation for the research
- References of published efforts may be used to improve the proposal

A link to upload the proposal will be provided to the applicant once the advisor has made their selection.

Questions about this opportunity? Please email ARLFellowship@orau.org

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Bachelor's Degree or Master's Degree.
- **Academic Level(s):** Any academic level.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Life Health and Medical Sciences** (2 👁)