

1. **Research Title:** Synthetic Biology for Biomaterials Development
2. **Individual Sponsor:**

Dr. Michael S. Carter, AFRL/REEB
AFRL/REEB Bldg 654, Room 246
2977 Hobson Way
WPAFB, OH 45433-7333
michael.carter.90@us.af.mil

3. **Academic Area/Field and Education Level**

Synthetic Biology, Protein Engineering, Biotechnology, Biomaterials, Microbiology,
Genetics (BA/BS, MS or PhD level)

4. **Objectives:** Researchers will use Synthetic Biology techniques to produce biological molecules and structures with target functions and properties.
5. **Description:** Biological processes have evolved to use abundantly available feedstocks to assemble robust structures that are resilient to environmental stress. Biomaterials research seeks to leverage and manipulate those same processes to develop materials that share many of the same performance requirements as biological systems but are optimized for industrial applications. This research topic seeks a dynamic scientist or engineer to integrate into protein and strain engineering initiatives within our bioproduction, biomanufacturing, and biomaterials research. The topic includes basic and applied research toward optimizing functions across diverse environmental conditions in both model and non-model biological systems. Included research tasks will combine contemporary genetic tools tailored for diverse target host systems with onboarding, developing, and employing high-throughput screening workflows to rapidly discover top-performing proteins, enzymes, and strains. The work is integrated into a multidisciplinary collaborative team of computational and bench researchers who aim to refine biomolecule and cellular structures for groundbreaking applications—including the development of novel complex hydrocarbons, advanced ceramic materials, and next-generation optical materials.
6. **Research Classification/Restrictions:** Unclassified and unrestricted. Eligible for public release.
7. **Eligible Research Institutions:** All DAGSI institutions
8. **PA Approval #:** AFRL-2026-3778