

## Attachment 1 – Research Topic Template

1. **Research Title:** Novel Materials and Structures for Sensors Development
2. **Individual Sponsor:** Rajesh Naik AFRL/RXAS, 2941 Hobson Way, Bldg 654  
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3. **Academic Area/Field and Education Level**

Materials Science and Engineering, Chemical Engineering, Bioengineering, Biology (working towards M.S. and/or Ph.D.)

4. **Objectives:** Identify, characterize, and fabricate novel inorganic and organic materials and structures for incorporation into biosensor platforms

5. **Description:** Recent advances in the field of materials research have included development of 2D and 3D materials and structures with properties that can significantly impact and perhaps revolutionize the development of biosensor devices. This project focuses on the identification and characterization of novel inorganic and organic materials that provide enhanced device performance or yield new biosensing paradigms. Selected materials and structures will be integrated into existing sensor platforms and/or provide for development of new sensor platforms. Recent biosensor research efforts have explored the development of plasmonic and electronic materials as platforms for biosensing applications. Materials of interest include: soft materials (polymers, silk, peptides, nucleic acids), nanomaterials (graphene, molybdenum disulfide, carbon nanotubes) and heterostructures (hybrid materials). Properties of interest include: optical, mechanical, electrical, plasmonic, and dielectric. Our overall goal is the development of materials and fabrication protocols for selective material incorporation into sensor devices to address the diverse range of AF biosensor needs.

6. **Research Classification/Restrictions:** This research is unrestricted and results will be in the public domain.

7. **Eligible Research Institutions:** Indicate to what organizations this topic should be provided

**DAGSI** (Wright State University, AFIT, Ohio State University, University of Dayton, Miami University, Ohio University, University of Cincinnati) NOTE: Topics submitted to DAGSI must be approved for public release. Need PA Approval #

**AFIT (only)**

**USAFA (only)**

If you are submitting a topic for the USAFA, indicate if you are also interested in sponsoring a USAF Cadet in summer 2015 (Average cost for USAF Cadet for 33 days is \$5000)

Yes

No