RX21-1

Attachment 1 – DAGSI Research Topic Template

1. **Research Title:** Molecular simulation of the biocompatibility and biodegradation of polymer hydrogels.

2. **Individual Sponsor:** List the AFRL research topic sponsor's contact information

Dr. Rajiv Berry, AFRL/RXAS
AFRL/RXAS Bldg 654, Rm 307
2941 Hobson Way
WPAFB, OH 45433-7333
Rajiv.Berry@us.af.mil

3. **Academic Area/Field and Education Level**
Mechanical Engineering/Chemistry/Computer Science/Materials Engineering (MS or PhD level)

4. **Objectives:** Investigate the biocompatibility and biodegradation of polymer hydrogels via atomistic simulations.

5. **Description**: The project will utilize classical molecular dynamics and coarse-grain models to investigate the biocompatibility of polymer hydrogels under consideration for "non-invasive" injectable biosensor applications. The target hydrogels will be modeled to predict their mechanical and transport properties as well as their ability to degrade under biological conditions. The principal outcomes will be guidance to the development scientists and engineers in terms of the suitability of the candidate polymer to match skin compliance and improved definitions of the factors which most strongly affect oxygen diffusion within the hydrogel. The proposed research supports a direct method to augment human performance by identifying and amplifying biomarkers associated with aircrew performance.

6. **Research Classification/Restrictions:** This research is unclassified and has no restrictions.

7. **Eligible Research Institutions:** Ohio research universities that offer graduate level research programs in the disciplines listed above.

NOTE: Topics submitted to DAGSI must be approved for public release. Need PA Approval #