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

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

Dr. Rajiv Berry, AFRL/RXAS
Bldg 654, Rm 307
2941 Hobson Way
WPAFB, OH 45433-7333
Raiiv.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 proposed research supports development of a direct method to augment human performance by identifying and amplifying biomarkers associated with aircrew performance. The project will utilize molecular dynamics and coarse-grained models to investigate the biocompatibility of candidate polymer hydrogels as injectable biosensors. Candidates will be modelled to predict their mechanical and transport properties as well as their ability to degrade in a biological environment. The principal outcomes will be guidance to development scientists and engineers in terms of hydrogel match to skin compliance, clearer identification of the factors which most affect small-species diffusion, and comparative degradation rates among the candidates.

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 #