Summary Statement of Research Interests for Juliet Hahn:

I have been working on the 3 research projects described herein and am the sole principal investigator (PI) of these noncollaborative projects. These 3 projects will continue into a future tenure track faculty position. There will be no downtime waiting for me to develop a research project and I will hit the ground running as PI. Interspersed within all of these research projects is educational research (developed from necessity) of efficiently training students with limited science background to do chemistry research quickly. **These research projects will NOT continue into postdoctoral or research only positions because I am basically a professor NOT just a research scientist.**

Project A: Carbon Nanotube Materials Carbon nanotube will be modified using DNA bases, surfactants and porphyrin and characterized by spectroscopic techniques (FT-NMR, FT-IR, UV-Vis and Raman spectroscopy). The surfactant CNT (carbon nanotube) modification project (funded as a research subcontract with Johns Hopkins Applied Physics lab) will continue. Because of startup fund limitations, the CNT DNA modification research project has been proposed but has not yet started. I am also proposing a new research project using porphyrin CNT functionalization. These projects have applications in: (a) developing new solar energy collectors (b) development of semiconductors and transistors (c) drug delivery.

Project B &C : Thymine Photodimerization The mechanism of the photodimerization of a derivative of the DNA base, thymine, will be investigated. The project is bioorganic in scope and nature and will not extend to the biochemical or biological systems. A commercially available stand alone DNA base derivative will be derivatized and used to simulate the photodimerization implicated in skin cancer. This project has applications in: (a) understanding the mechanism of skin cancer (b) synthesis of DNA based pharmaceuticals

Project D: Tropanone Stereoselective Synthetic Methodology Stereoselective synthetic methodology of tropanone, a derivative of cocaine, will be investigated using organoaluminum catalysis and a modification of the heterocyclic amine structure. Tropanone is one of a class of some 200 natural products many of which have biological and pharmaceutical effects. This project has applications in developing pharmaceuticals for treating (a) Alzheimer's disease (b) cocaine addiction (c) other neurological diseases

Project E: Educational Research From teaching and doing research with a number of geographically and socioeconomically diverse students over a number of years, I have developed some innovative educational ideas by necessity. I have some original ideas on how to teach large section (50 to 200 student) lectures. I also have new ideas on how to do research with students with limited science experience with a short training time.

These projects need startup funds typical for an experimental organic chemist. (on the lower end in startup funds needed by most Organic Chemists – I started out at DSU with $3,500 in start up funds 5 months after I arrived at DSU and then added equipment as research grants were funded.) I already have a lot of preliminary data for these projects so that the projects will be up and running with a minimum of delay. I have had approximately 15 undergraduate students working on these research projects during my 3 years at DSU. The research projects are appropriate in scope for both undergraduate and graduate students.

Available: (a) 13 page "Statement of Research Interests" (b) video Research Statement at: www.youtube.com/JulietHahnPhD (view playlist)

Research Summary is based on **more than ~ 30 research proposals** (**4 to 30 page fully developed** research proposals) submitted to funding agencies such as NSF CAREER, NIH SCORE, ACS PRF, Research Corporation, NIH AREA as **sole principal investigator**. **(Upon request a 7 page, 13 page or 30 page research interests document is available.)**