

Tulane chemistry professor receives national award

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Barri Bronston bbronst@tulane.edu

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Bruce C. Gibb, a professor of chemistry at Tulane, will use the NSF Creativity Extension Award, in part, to promote chemistry and science in general in the broader, local community. (Photo by Paula Burch-Celentano)

[Bruce C. Gibb](#), a professor of chemistry at the Tulane University School of Science and Engineering, has received a rare and coveted National Science Foundation (NSF) Special Creativity Extension Award.

The two-year NSF Creativity Extension honor will be for his NSF-funded project titled “Cavitands and Self-Assembled Capsules as Supramolecular Reagents and Organo-Catalysts.” The objective of such an extension is to offer the most creative

investigators an extended opportunity to attack "high-risk" opportunities in the same general research area, but not necessarily covered by the current award. Of funded NSF proposals, less than 0.2% have historically been granted a Special Creativity extension.

The aim of Gibb's research is to develop new approaches to making molecules that rely on large, bowl-shaped "host" molecules. These hosts can bind molecules for transformation. Alternatively, two "bowls" can assemble into a nano-capsule which can then be used for molecular transformations. The hosts and dimer hosts are all water-soluble, and use the hydrophobic effect — loosely defined as why oil and water don't mix — to bring the necessary molecules together to affect the desired transformation. The overall aim is to discover ways to orchestrate the required reaction components in space and time, and hence to engender efficient and mild transformations in the greenest of solvents, water.

Gibb said the program will impact a number of fields of chemistry, science, and science education. For example, not only will the work push the state-of-the-art of supramolecular chemistry (the chemistry between molecules), but it will also positively impact our understanding of enzymes in living systems, and contribute to the development of new organic synthetic processes for labs and industry.

The award will also directly impact graduate and undergraduate education within the Gibb group to help maintain the health of the nation's scientific endeavors. In addition, the research program involves outreach activities designed to promote science, and in particular chemistry, within the broader, local community.