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## Grants Will Expand Chemistry and Biochemistry Research Opportunities

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# Grants Will Expand Chemistry and Biochemistry Research Opportunities

## Quick Facts

- Chemistry Professor Jay Hanna was approved for a \$70,000 grant from the American Chemical Society Board of Directors that will last through the summer of 2020.
- Three other faculty members – Aaron Hartel, Cliff Harris and Nick Grosseohme – had proposals awarded in South Carolina for up to \$10,000 for the next academic year.



Jay Hanna

ROCK HILL, SOUTH CAROLINA – Four Winthrop University chemistry and biochemistry faculty members were awarded grants this summer that will provide opportunities for more undergraduate research on energy, cells and molecules.

**Chemistry Professor Jay Hanna** was approved for a \$70,000 grant from the **American Chemical Society Board of Directors** that will last through the summer of 2020.

Reviewers noted that Hanna has a strong track record of engaging undergraduates in meaningful, publishable research over an extended period of time and has mentored several students who have advanced to graduate programs. Also, energy data from preliminary experiments conducted by Hanna and his students were very strong and convincing in what is a new area of research for him, said **Pat Owens**, chair of the **Department of Chemistry, Physics & Geology**.



Aaron Hartel

Three other faculty members – **Aaron Hartel**, **Cliff Harris** and **Nick Grosseohme** – had proposals awarded in South Carolina for up to \$10,000 for the next academic year. The **State EPSCoR/IDEA Office**, which stands for Established Program to Stimulate Competitive Research (EPSCoR) and Institutional Development Awards (IDeA), is a federal-state-university partnership designed to increase research support for states such as South Carolina who have historically received low levels of federal research and development funds. The office gave out only 11 grants statewide in this year's cycle.



Cliff Harris

Recipients of this funding will have their students receive stipends, and they will be able to attend the **2018 SC EPSCoR/IDEAstate conference** to present their research results and experiences.



Nick Grosseohme

Here are the projects the professors will be working on:

**\*Jay Hanna** – He said that most of the products we take for granted in society – medicines, plastics, pesticides, dyes and even cosmetics – require energy, often generated by burning fossil fuels, as an integral part of the manufacturing process.

“The objective of our research is to discover ways to use visible light as an energy source for some of these chemical reactions. The ultimate goal would be to develop the use of ordinary light bulbs, or better yet, sunlight, as a practical energy source for the fabrication of these substances; in essence, a kind of ‘artificial photosynthesis’

approach to chemical transformations.” In addition, Hanna said, an understanding of the fundamental science behind this approach may lead to new chemical transformations that are not currently possible.

**\*Nick Grosseohme** - Iron plays a very important role for nearly all living organisms; however, it is also toxic if it is allowed to accumulate inside cells. Consequently, cells have evolved ways of controlling the amount of iron to ensure that there is enough to be healthy but not too much to be lethal. "Streptococcus pneumonia is a bacteria that naturally lives in our nose and throat: it can lead to disease (pneumonia, strep throat and meningitis) when it migrates into other tissues," Grosseohme said. "Curiously, the way that this bacteria controls the levels of iron is not known. A better understanding of how this bacteria controls iron could lead to the development of better antibiotics." The research that is funded by this grant will allow Grosseohme and his students to investigate one possible iron control system.

**\*Clifton Harris** – His work aims to create special coatings that can absorb the sun’s energy and use that energy to break the chemical bonds in water, which are hydrogen-oxygen bonds. "By breaking these bonds, we can decompose water into its base elements, hydrogen gas and oxygen gas," Harris said. "The significance of this is that hydrogen gas is a very energy-rich fuel source that produces zero harmful emissions after combustion. So, in essence, we are converting sunlight to fuel."

**\*Aaron Hartel** – He and his students will develop new chemical transformations that enable chemists to build larger molecules by combining smaller, simpler ones. "These novel reactions form critical carbon-carbon bonds and have potential application in the development and production of pharmaceuticals," Hartel said.

For more information, contact **Judy Longshaw**, Winthrop news and media services manager, at 803/323-2404 or [longshawj@winthrop.edu](mailto:longshawj@winthrop.edu).

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