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INBRE II Grant Will Offer Faculty and Students Many Opportunities for Biomedical Research

Winthrop University

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INBRE II Grant Will Offer Faculty and Students Many Opportunities for Biomedical Research

Quick Facts

- The main goal for Winthrop's \$2.6 million portion of a \$16 million grant to 10 S.C. universities is to increase the number of faculty members and students conducting biomedical research.
- Winthrop officials also want to continue as a university leader in recruiting and educating students from under-represented and disadvantaged groups into biomedical graduate research programs.



Takita Sumter

ROCK HILL, S.C. - Faculty members hope the **INBRE II grant** will have as sizeable an impact on the university's science programs as the first grant cycle.

The main goal for Winthrop's \$2.6 million portion of a \$16 million grant to 10 S.C. universities is to increase the number of faculty members and students conducting biomedical research. Winthrop officials also want to continue as a university leader in recruiting and educating students from under-represented and disadvantaged groups into biomedical graduate research programs. A third goal is to increase the number of research grant proposals and student co-authored research publications.

To accomplish these goals over the next five years, **Winthrop** and the **National Institutes of Health (NIH)** will support five target faculty investigator projects, as well as provide biomedical research support to several other Winthrop faculty members.

Here are those involved in faculty research projects supported by NIH:

- **Eric Birgbauer**, biology: understanding the process by which nerves within the visual system grow during development. Birgbauer hopes that this process, once characterized, can then be exploited in the development of therapies to induce tissue regeneration as a treatment for neurological disorders.
- **Nicholas Grosseohme**, chemistry: understanding how a cell can sense and respond to non-ideal concentrations of copper, an essential cellular nutrient that can be harmful if not controlled. The research explores copper control using several instrumental approaches.
- **James Hanna**, chemistry: developing new molecules of potential pharmaceutical interest and exploring new and more efficient methods to prepare these compounds. A major area of research (in collaboration with faculty member Robin Lammi) is the design and evaluation of novel inhibitors of amyloid-beta peptide aggregation, which may be important to the development of future therapies for Alzheimer's disease.
- **Jason Hurlbert**, chemistry: determining the three-dimensional structure of enzymes that assist cancer cells in escaping death following treatment with chemotherapeutic agents. Knowledge of the enzymes' structures will facilitate efforts to design drugs targeting these enzymes and thus increase a cell's susceptibility to treatment.
- **Julian Smith**, biology: understanding the genetic mechanisms by which animals produce new skin cells. These new cells are used to replace cells that are lost through traumatic injury or normal wear-and-tear, and also to generate new skin to accommodate growth of the organism. Failure of these

regulatory mechanisms can cause problems such as skin cancer in humans.

Other faculty members conducting biomedical research are:

- **Heather Evans-Anderson**, biology: using an invertebrate model system to study the development of the cardiovascular system. Because these invertebrates are capable of regenerating their hearts in response to damage, the research aims to understand the role of conserved genes in heart development and regeneration.
- **Laura Glasscock**, biology: identifying and understanding the proteins involved in prostate cancer progression with a specific interest in understanding how these proteins facilitate the events that cause the tumor spread from the site of origin to other tissues.
- **Christian Grattan**, chemistry: developing inhibitors of an enzyme that plays an important role in cancer cell growth. Using a promising template inhibitor, Grattan is working to change the compound so that it is more readily available to cells when taken orally. The ultimate goal is to develop a useful and effective cancer treatment.
- **Robin Lammi**, chemistry: collaborating with Jay Hanna to design and test compounds that inhibit the aggregation of amyloid-beta peptide, which is linked to Alzheimer's disease. Collectively, these studies afford insight into poorly understood protein association and inhibition processes; they may also result in promising architectures for Alzheimer's therapies.
- **Takita Sumter**, chemistry: understanding the molecular events that result in cancer initiation and progression. The current research is aimed an understanding how the cell activates specific proteins as a means of transitioning a normal cell to the cancerous state.
- **Kristi Westover**, biology: using bioinformatics techniques to project evolutionary pathways of the Hepatitis B virus. Viruses like Hepatitis B are effective based on their abilities to infect an organism and escape that organism's immune response. These studies are designed to understand exactly how viruses evade the immune responses of hosts.

The five-year INBRE I grant increased the number of Winthrop research proposals submitted to external agencies, resulting in more than \$1.5 million in awards between 2005-10. Students became more engaged in biomedical research, with 96 undergraduates and eight graduate students participating. Also, 27 undergraduates headed to graduate programs to earn Ph.D. degrees in chemistry, biology or biomedical sciences.

The robust growth of Winthrop's biomedical research program is the result of two essential elements, according to **Sumter**, who has been designated as part of a scientific oversight team for INBRE II. "Winthrop has a dynamic group of faculty who selflessly share their time, talents and enthusiasm for science with students and has the unwavering support of university officials who continue to support quality undergraduate research experiences even in these tough economic times," Sumter said.

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