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inquire

Volume 8 • 2014

UAB's UNDERGRADUATE RESEARCH JOURNAL

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Front cover art:

"Tree of Life"

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INQUIRO STAFF 2014



inquireo

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Founded and staffed by undergraduates at the University of Alabama at Birmingham, *Inquireo* is an annual journal produced with the mission of highlighting the contributions of undergraduates to UAB's many outstanding research programs and supporting the development of these student researchers by providing an outlet for them to publish their work. Any students who have conducted research at UAB, including those visiting from another institution, are invited to submit research manuscripts, short reports derived from scientific posters, or personal narratives regarding their research experiences. Authors retain full rights to their work, and are free to submit to other journals after publishing in *Inquireo*.

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letter from the editor

Science unifies the human race. People from every corner of the globe foster an innate thirst for knowledge and a curiosity about the strange and wonderful world around them. This shared desire to unravel the mysteries of the universe has led to collaborations between nations on an unprecedented scale. Projects like the International Space Station and the Large Hadron Collider at the European Organization for Nuclear Research (CERN) have seen contributions in materials, design, and manufacturing from fifteen and twenty-six nations, respectively, making them the most cooperative endeavors in human history.

While collaboration in science is inspired by something we all share—a curiosity about our world—our differences are what make this cooperation so fruitful. Science thrives best in an environment in which people with different academic and personal backgrounds are free to exchange ideas and share resources that can lead to innovative solutions to research questions. One reason that undergraduate research at UAB is so successful is that UAB encourages the collaborations and interdisciplinary conversations that are so important for creating such an environment.

I had the opportunity to become involved in research early in my career at UAB, working on a genetics project in the Department of Epidemiology. As my scientific interests broadened and matured, I was able to develop and complete a joint project between the Department of Physics and the Department of Neurobiology. These projects would not have been possible without the environment of constructive cooperation at UAB. As I prepare to pursue a graduate degree in biophysics, I have reflected on the opportunities that UAB has given me as an undergraduate student to refine my intellectual interests and develop my skills as a young scientist, including peer mentoring, technical writing, presenting at national and international conferences, and publishing. Working as an editor for *Inquire* has allowed me to take an active role in the latter and to help broaden the opportunities for other undergraduates to disseminate their own scientific work.

John was drawn to UAB in large part because of the wealth and depth of research opportunities it offers to its undergraduates. Since his Freshman year, his experiences designing, conducting, presenting, and publishing on research projects have allowed him to explore and refine his interests and have confirmed his desire for a life and career in which science will play a large role. His work with *Inquire* has been motivated by his love of language and writing, his wish to share the joy of scientific investigation and discovery, and his hope of making important opportunities in writing and publication more available to UAB's young scientists.

During the past year, John and I have endeavored to make this edition of *Inquire* more accessible to everyone. We have increased the number of student staff members on our Editorial Board and looked to better represent the diversity of people and interests within the community of students, faculty, and researchers at UAB. We have also significantly expanded our Science News section in hopes of giving our student writers more opportunities to speak about the areas of science that excite them both inside and outside of UAB. As part of this effort, you will notice two new kinds of articles in the Science News section. In addition to the traditional news articles and faculty interviews, this edition of *Inquire* introduces book reviews and film reviews. In these pieces, you will find accounts of media both new and old that focus on interesting scientific discoveries and those who made them, as well as comments from our staff about their relevance to the scientific community and to aspiring scientists today. We hope that you will find these reviews entertaining and insightful.

As always, however, the heart of this edition lies in a strong collection of research articles from young scientists in the UAB community. We have worked with our authors and reviewers this year to ensure that these manuscripts are easy to read and understand for non-experts yet uncompromised in their scientific integrity and rigor. The research articles in this edition represent such academic fields as physics and materials engineering, chemistry, microbiology, neuroscience, psychology, and bioinformatics. Additionally, we have included two narrative pieces detailing students' personal experiences with the process of scientific research. We hope that these articles give you a glimpse into the kinds of exciting research projects that undergraduate students can undertake at UAB and inspire you to learn about and become involved with undergraduate research.

In addition to our incredible student staff, *Inquire* owes its continued success to a host of university faculty and staff. Our faculty reviewers volunteer their own time to help our student authors improve the strength of their manuscripts and to ensure that our research articles adhere to a rigorous standard of quality. Mike Sloane continues to offer his advice on the journal's operation. Peter O'Neil has provided guidance on how the journal can better reach its target audience. In the Office of Undergraduate Research, Nick Bieser has assisted us with creating and improving the online submission and review forms, and Tomader Ali has offered ideas about new directions for the journal. Ryan McNulty of UAB Printing Services has helped us to set our content within a professional-quality design and worked with us to ensure that every aspect of the issue meets *Inquire's* high standards. Finally, Robert Palazzo and Suzanne Austin have provided the financial and administrative support without which the publication of this issue would have been impossible. To our student staff, authors, and artists; faculty reviewers and mentors; and supporters in the UAB staff and administration, we offer our sincere gratitude.

Whether you are interested in reading a fascinating research article, a student perspective on undergraduate research at UAB, or a discussion of new discoveries in the scientific community at large, we think that you will find something in these pages that will engage your passions and your curiosity. We hope that this edition of *Inquire* motivates students to seek out the many opportunities available at UAB to bolster their careers as research scientists and encourages faculty to continue to mentor the bright young minds that make up the community of undergraduate researchers.

Chapin Cavender, Senior Chief Editor 2014-2015

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