As a land-grant institution since 1869, Purdue has a long history of creating innovations that have changed lives and improved communities around the world. Today, faculty teams are dedicated to answering the grand challenges of the 21st century. Purdue researchers are improving global food security, developing alternative fuel systems, and effectively combating cancer—and this is just a sampling of their vital work.

Guided by talented faculty in classrooms and laboratories throughout campus, Purdue undergraduates are developing research skills of their own. Using various methods—quantitative, qualitative, exploratory, scientific inquiry—students are investigating such areas as national and global health, community and economic development, and environmental improvement. The results of their work are manifest in the Journal of Purdue Undergraduate Research (JPUR).

The student research in this journal advances new knowledge while also benefiting the students who worked hard to obtain it. In the seminal report called Reinventing Undergraduate Education: A Blueprint for America’s Research Universities, the Boyer Commission recommended early research experiences. The Commission noted that for undergraduates who participate in research, “the abilities to identify, analyze, and resolve problems will prove invaluable in professional life and in citizenship” (Boyer, 1998). Purdue fully embraces this idea. Undergraduate research is available in nearly every college and school at Purdue and we urge our undergraduates to seek out these opportunities. In the Honors College every student is required to complete a research project or another scholarly activity that leads to a thesis. Whether students seek employment or pursue advanced degrees after graduation, research provides an experiential advantage.

Just as important as the research process is the ability to clearly communicate the results. JPUR is a student-run publication with outstanding support from members of the Purdue University Press, Purdue University Libraries, the Online Writing Lab located within the Department of English in the College of Liberal Arts, and Purdue Marketing and Media. JPUR has received more than 350 student proposals since its inception in 2011, and nearly 65 for this volume alone.

Students whose research is selected for the journal participate actively in the publishing process: summarize, edit, review, edit again . . . and again. As they refine their research results students learn how to craft well-defined conclusions into concise scholarly papers. This learned discipline of clear, organized writing will serve them well throughout their lives.

Collaboration is at the heart of any successful research, and the relationship between students and their teachers is especially significant. I want to personally thank Purdue’s faculty members who guide, coach, and support students through the discovery process. Many remain mentors to our students long after they leave the classroom.

We are pleased and proud to present this fifth edition of JPUR, a compendium of undergraduate research and so much more.