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# BRUSHING UP ON KNOWLEDGE FOR INTERDISCIPLINARY WORK AND STUDY

Researchers must keep up to date with advancements in their field, but also learn about new areas of interest when engaging in interdisciplinary or collaborative research. It can be challenging and time-consuming for researchers at any career stage to learn a new field, become accustomed to its jargon, and gain familiarity with its experimental techniques. Researchers can easily learn about new fields and delve deeper into their topic areas through ACS digital books.

## Teamwork Drives Innovation

Researchers explore big questions in their work. Often, that exploration takes them outside of their particular field of expertise. Understanding how one science discipline relates to another equips researchers with the knowledge they need to be creative and innovative.

There are many examples of interdisciplinary research at work today. Biologists, geneticists, computer scientists, and physicists come together at the Allen Discovery Center at Tufts University to explore how bioelectrical signaling mediates cell behaviors during development. Recently, a research team there developed a model of nicotine-induced neural patterning defects in the developing *Xenopus* brain, which has implications for regenerative medicine.<sup>1</sup>

Another area of intense interdisciplinary research is biomedical nanotechnology. By combing expertise in life

sciences, chemistry, physics, materials science, and engineering, scientists are building technologies for disease monitoring, treatment, diagnostics, and personalized health management.<sup>2</sup> For example, researchers are investigating the antimicrobial properties of a natural polymer derived from chitin and its future as a nanoparticle in drug delivery.<sup>3</sup>

Interdisciplinary research is becoming an important part of the research landscape. As such, funding agencies such as the National Institutes of Health (NIH) and the National Science Foundation (NSF) encourage collaborative research through grant programs designed to change the academic research culture and reward interdisciplinary approaches.<sup>4</sup> Such grants allow collaborating researchers to pool their resources as they tackle innovative questions.

## Accessing Knowledge for Fruitful Collaborations

Although the importance of interdisciplinary research seems clear, interdisciplinary training for graduate students and continued education for established researchers is not always easy to access.

ACS In Focus digital books serve as an easy, straightforward way for busy scientists to explore new disciplines on their own time. The digital books provide more information than review articles, but are more focused and up to date than textbooks. As such, they are appealing to both students and experienced scientists, quickly facilitating the knowledge acqui-

sition needed to expand research horizons. When researchers learn about other fields, they enhance their own knowledge and communicate more effectively with collaborators in other disciplines, allowing them to reach wider audiences with their work, secure more funding, and find new inspiration to ask even bigger questions.

Researchers explore big questions in their work. Often, that exploration takes them outside of their particular field of expertise.

## References

- 1) V.P. Pai et al., "HCN2 Rescues brain defects by enforcing endogenous voltage pre-patterns," *Nat Commun*, 9:998, 2018.
- 2) A. Kaushik, "Biomedical nanotechnology related grand challenges and perspectives," *Front Nanotechnol*, 0, 2019.
- 3) C. Ardean et al., "Factors influencing the antibacterial activity of chitosan and chitosan modified by functionalization," *Int J Mol Sci*, 22:7449, 2021.
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# INTRODUCING ACS IN FOCUS DIGITAL BOOKS

**A**CS In Focus digital books from the American Chemical Society (ACS) are digital publications that provide a comprehensive primer of popular science topics. With in-text visual features that bring science to life and an intuitive e-reader interface, all readers can advance their knowledge and expand their research capabilities.

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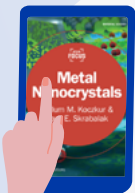
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# BRIDGE THE GAP BETWEEN TEXTBOOK AND JOURNAL RESEARCH

Readers of all knowledge levels need to easily access content that expands their understanding of fundamental and emerging science topics and techniques. Students exploring science career paths often desire more reliable and accessible sources of information beyond online encyclopedias and journals, while seasoned scientists need to quickly research diverse fields to foster collaborations and grant-writing across disciplines. From brushing up on the basics of a science field to learning a new skill set, digital books offer a convenient way to access the right amount of information.

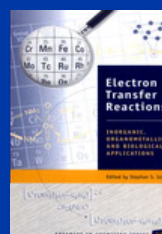
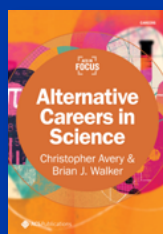
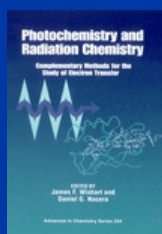
## Traditional Sources of Knowledge Can Be Cumbersome

When looking for an overview of a topic, many students and researchers turn to books, including textbooks, which deliver thorough introductions to various science disciplines. However, these books cover an overwhelming breadth of knowledge that is time-consuming to rifle through.

Obtaining these books from a library is also cumbersome. Often users must initiate transfers of content between libraries, wait for the transfers to process, and travel to their library's physical location to pick up and drop off the requested materials. There is a limit to the time that material can be checked out. When reading the content, users have no choice but to take notes manually or on their computers; these notes remain separate from the books, which they must ultimately return.

Alternatively, individuals can search for the information they seek in peer-reviewed journal articles. Within these sources, individuals find the most up-to-date information. It is also difficult to take notes when reading journal articles. PDF readers offer some rudimentary search and note-taking functions, but they are difficult to manage and organize. Additionally, journal articles highlight only narrow areas of research, are overly technical, and serve as poor introductions to broad topic areas.

Digital books provide in-depth and accessible introductions to numerous scientific topics, bridging the gap between textbooks and peer-reviewed journal articles.





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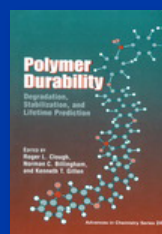
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*ACS eBooks*, comprised of the *ACS Symposium Series* and *Advances in Chemistry*, provide novel research in

a broad array of scientific topics. Each chapter is individually authored by an expert in the field and peer-reviewed. Books date back as far as the 1940s with some books reaching reference-style status. Alternatively, individuals can search for the information they seek in peer-reviewed journal articles. Within these sources, individuals find the most up-to-date information. It is also difficult to take notes when reading journal articles. PDF readers offer some rudimentary search and note-taking functions, but they are difficult to manage and organize. Additionally, journal articles highlight only narrow areas of research, are overly technical, and serve as poor introductions to broad topic areas.

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