**PHARMACEUTICS CAREERS**

The increasing importance of drug delivery in the overall drug discovery and development process is widely appreciated by pharmaceutical industry: delivery methods improve drug efficacy and safety, and provide new markets and extend drug patent lifetimes. Current therapeutic value emphasizes improving targeting of bio-active chemical species to specific sites of action. While easily stated, this is quite difficult to do experimentally, requiring multi-disciplinary teams of scientists strongly grounded in basic and applied sciences, engineering and medicine. Consequently, our Ph.D. graduates with diverse scientific training and research skills are highly recruited.

Many graduates choosing industrial positions become involved in product development research, and apply their skills to solutions of commercial, practical, yet challenging problems across the pharmaceutical and biomedical device industry. Others select positions oriented more toward fundamental research with less emphasis on short-term product-oriented goals.

Numbers of basic research positions in pharmaceutics are expanding rapidly as the pharmaceutical industry in the United States...
recognizes advantages of long-range research to compete effectively in a global scientific and economic environment. Entry-level positions are found as often in smaller, rapidly moving biotechnology and biopharmaceutical companies as they are in traditional industrial giants like Johnson & Johnson, Pfizer, 3M, Amgen and Genentech.

Many pharmaceutics graduates begin their industrial career ladder in research; some then choose to transfer to administrative, business management, legal, regulatory and investment career tracks. The increasing dimensionality of the international pharmaceutical business requires more sophistication and versatility, providing diverse career opportunities to those capable of remaining up-to-date. Researchers with strong scientific backgrounds, management talent and ambition become more and more sought for important corporate management positions. Increasing numbers of pharmaceutics-trained individuals now entering upper management impact the direction of health-related research programs in the future. The demand for outstanding researchers in pharmaceutics will, therefore, continue to grow and their job opportunities will expand into many dimensions of this business.

Graduates interested in providing training and guidance for future researchers while directing their own research programs may opt for careers in academia as faculty or staff researchers. This career offers mentoring, teaching, and research components spanning basic science, professional pharmacy training, and clinical medicine collaborations.

Internationally, pharmaceutics academic programs are expanding, continuously seeking capable teaching and research faculty. The Ph.D. degree provides direct access to these academic careers.

Microscopy: Cell targeting with polymer drugs

PREPARING FOR CAREERS IN PHARMACEUTICS

The University of Utah’s Ph.D. program in pharmaceutics comprises intensive coursework to cover essential topics in basic science, and most importantly as a research degree, in-depth research experience. Most students entering with a bachelor’s degree in a related discipline fulfill their Ph.D. degree requirements within 4-5 years. Highly motivated students with bachelor’s degrees in chemistry, engineering, biochemistry, microbiology, biology, biomedical science, mathematics or pharmacy are best prepared to enter the pharmaceutics graduate program. The difficulty to fully prepare for this rigorous graduate program with an undergraduate degree is recognized: skills that are lacking are made up during the first year of pharmaceutics graduate studies. Undergraduates are advised to complete the entire undergraduate calculus sequence to qualify to begin the physical chemistry sequence (a pre-requisite for most advanced graduate-level courses) immediately upon entry. This avoids significant delays in completing the pharmaceutics graduate curriculum.

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