

Amgen Seminar Series in Chemical Engineering  
in  
Cherry Auditorium, Kirk Hall, 1 PM

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**The Evolving Role of Chemical Engineers in the Pharmaceutical Industry**

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Traditionally in the pharmaceutical industry, chemical engineers have been employed in the manufacture of fine chemicals, advanced intermediates and Active Pharmaceutical Ingredients (API). They have also played an important role in the biotechnology industry, where their specialized understanding of fermentation and separation techniques has been utilized effectively. In the last twenty years, they have also had growing opportunities to contribute to the development of drug products. Such industries allow for the application of skills and techniques that a chemical engineer learns: unit operations, reaction kinetics, thermodynamics, mathematical modeling, process development and scale-up, cost analysis, *etc.* However, with the emergence of new types of dosage forms such as multi-particulate and osmotic delivery systems, transdermal patches, iontophoretic delivery, colonic, floating, and implantable delivery systems, greater opportunities are being afforded to chemical engineers. More recently, universities have begun to offer a "Pharmaceutical Engineer" degree, which combines the curriculum of engineering, industrial pharmacy and FDA regulations. This talk will discuss specific examples of these new developments as well will attempt to address FDA's 21<sup>st</sup> Century Initiative and its impact on the development of API and Drug Products.

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