



# 2010–2011 POCC Lecture Series

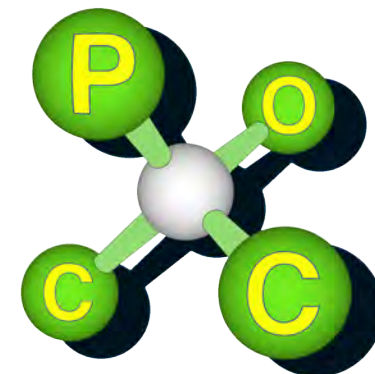
December 9, 2010, 8:00 PM

Dr. Christopher J. Welch  
Merck Research Laboratories

*The Use Of Platform Chemical Technologies For  
Accessing Pharmaceutical Enantiopurity At Merck*

Carolyn Hoff Lynch Lecture Hall  
Chemistry Building, University of Pennsylvania

The Philadelphia  
Organic Chemist's  
Club



POCClub.org

Christopher J. Welch is the scientific head of the Separation & Purification Center of Excellence at Merck & Co. in Rahway, New Jersey. Dr. Welch is also co-chair of NTRL, the organization that identifies funds and evaluates new technology opportunities for Merck. Dr. Welch has also worked in discovery synthesis of agrochemicals (Velsicol-Sandoz), development of reagents for improved immunodiagnostic assays (Abbott Laboratories), and development and commercialization of chromatographic stationary phases, reagents and enantioselective catalysts within a small chemical business environment (Regis Technologies). Since joining Merck Process Research in 1999, he has focused on developing and applying improved methods and equipment for purification and analysis of pharmaceutical intermediates, and is particularly interested in new paradigms for integrating preparative chromatography with organic synthesis and the development and use of greener separation technologies. Dr. Welch has authored more than 160 scientific publications and patents, and is co-founder of the journal, *Enantiomer*, and a member of the Permanent International Scientific Committee (PISC) for the International Symposia on Chirality. He is the recipient of the NJCG Award for Excellence in Chromatography and the PACS Activated Carbon Hall of Fame award. Since 2006, Dr. Welch has served the American Chemical Society as a councilor for the Organic Division.

**Abstract:** Platform chemical technologies are important tools for increasing the speed and efficiency of experimentation in pharmaceutical discovery and development.<sup>1</sup> Platform technologies typically incorporate a user friendly simplifying layer that masks an underlying layer of complexity, and offer generalized solutions that can be applied to entire classes of complex problems. Platform technologies for accessing enantiopurity include screening tools to rapidly evaluate and select optimal conditions for carrying out enantioselective synthesis, crystallization, or chromatography, as well as the high throughput screening tools that underpin the utilization of any of these other platforms. In this presentation, we will focus on recent examples from these laboratories illustrating the value of platform chiral technologies at Merck, from discovery, through development, and into manufacturing.

[1] I. Davies, C. J. Welch, *Science*. 2009, 325, 701.

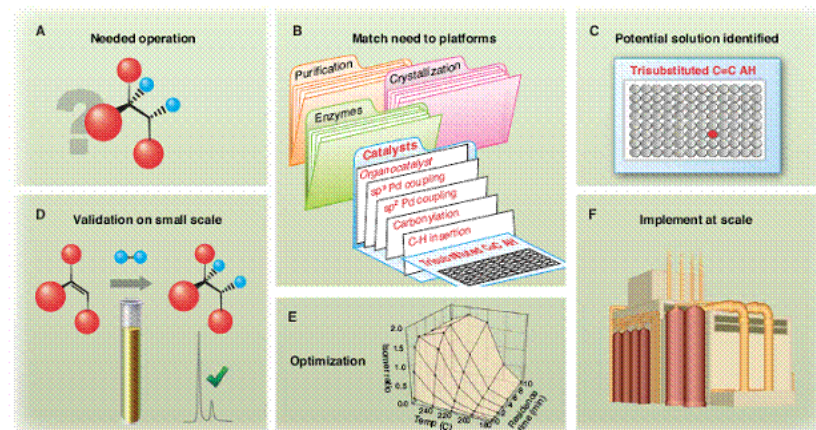


Fig. 2. Use of platform tools facilitates modern pharmaceutical process chemistry. Needed transformations (A) exemplified here by an asymmetric olefin hydrogenation) are matched against available platform tools (B). A potential solution is first identified (C), then validated on small scale (D), optimized (E), and implemented at scale (F).