



2020-2021 POCC Lecture Series

May 27, 2021, 7:30 PM

Virtual reception to follow after the seminar

Dr. Erin O'Brien

Biogen

Development of a Sustainable Manufacturing Process for Vixotrigine

Virtual Seminar by Zoom ([LINK](#))

The Philadelphia Organic
Chemist's Club



POCClub.org

Abstract: Manufacturing medicines typically generates a large amount of waste and only a small amount of drug substance. Minimizing the amount of waste reduces not only disposal costs but also results in more cost-effective production. At a time when resources are becoming scarcer and more expensive and the disposal of waste has become more complex, the pharmaceutical industry has started to prioritize more sustainable development of our manufacturing processes. The focus of this presentation will be on how the Chemical Process Development team at Biogen is working toward more sustainable manufacturing for its small molecule medicines. As an example, development of a late-stage process for vixotrigine (1), a potential treatment for trigeminal neuralgia, will be discussed. Improvements included enhanced safety and scalability through changing the manufacturing platform to incorporate flow processing for a Grignard reaction, simplifying unit operations, removal of heterogenous conditions and route redesign to afford a high yielding, one-pot sequential alkylation and amidation. Improvement in the salt formation step, combined with wet milling, resulted in improved particles with enhanced flow properties of the final API, needed for the tableting process. The complete E-factor of the process was improved 65% while maintaining drug substance purity more than 99.8%. This new process has been scaled up to generate metric ton quantities of drug substance.

About the speaker: Erin O'Brien's career has focused on small molecule synthesis. After completing her doctoral work at the University of Pennsylvania under the supervision of Marisa Kozlowski, Erin joined Roche Palo Alto as a research scientist in the Chemical Synthesis group. In 2009, Erin moved to Takeda, specializing in scale-up of high potency active pharmaceutical ingredients for Oncology indications. In 2016, Erin joined Biogen, leading the Process Chemistry group. Erin is vice-chair of the International Consortium for Innovation and Quality (IQ) drug substance leadership group; co-chair of the IQ green chemistry working group and is motivated by her passion for development of sustainable manufacturing processes.