

**Patrick Fier, Merck**

## **Developing Large-Scale Syntheses of Molnupiravir, an Antiviral for COVID-19**

In the face of increasing molecular complexity, shrinking timelines, and a goal to have robust and sustainable processes at the time of filing, process chemistry groups must continue to innovate in organic chemistry and process development. Specifically, innovations in biocatalysis and chemocatalysis are instrumental in order to provide simple, efficient, and sustainable routes to challenging new drug targets. This presentation will focus on the development of two routes to molnupiravir (Lagevrio), a small-molecule antiviral used for the treatment of COVID-19. The first route focuses on fundamental reaction understanding and process optimization which have led to the avoidance of thousands of tons of waste while providing several million treatment courses to patients around the world, while the second route embodies the most streamlined process to molnupiravir from the simplest commodity chemicals using novel biocatalytic transformations.