# Electrochemistry amps up in pharma

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Sparked by several high-profile reports, electrochemistry—using electricity to perform chemical reactions like oxidation and reduction—is gaining popularity in the pharmaceutical field. Some researchers have embraced the technology as a tool to synthesize compounds that are difficult or impossible to make using traditional chemical reagents, and to do so in a safer, more environmentally friendly way, according to an article in *Chemical & Engineering News* (C&EN), the weekly newsmagazine of the American Chemical Society.

Synthetic organic chemists typically use reducing reagents to introduce electrons to molecules and oxidizing reagents to strip them out. But sometimes, it can be difficult to change one part of a molecule without affecting the rest of it. In addition, many of these reagents are harsh and generate lots of waste, which can create safety concerns and disposal problems. In contrast, electrochemistry offers more selectivity in adding or removing electrons from chemical groups, along with producing less waste and toxic byproducts, Senior Correspondent Bethany Halford writes.

When medicinal chemists first began experimenting with electrochemistry, they often cobbled together large, inefficient setups to perform the technique. However, in 2017 a collaboration between a synthetic organic chemist and an instrument maker resulted in the ElectraSyn 2.0, an electrochemistry module that combines several bulky devices into a sleek, efficient package, opening up the technology to chemists who aren't electronics whizzes. Now, researchers have published several high-profile reports in which they used

electrochemistry to construct drugs and other molecules that couldn't be made (easily or at all) by traditional routes. The biggest remaining challenge is converting from lab-scale production, which is what the ElectraSyn 2.0 offers, to intermediate- and large-scale synthesis without having to completely re-engineer the system, process chemists say.

**More information:** "Amping up the pharma lab: Drug companies explore the potential of electrochemistry," cen.acs.org/synthesis/medicina … rug-companies/97/i43

Provided by American Chemical Society