Professor Burns studied chemistry at Columbia University under the mentorship of Professor James Leighton, and earned his Bachelor of Arts, summa cum laude, in 2004. His doctoral work was with Professor Phil Baran at the Scripps Research Institute in La Jolla, California, and addressed the synthesis of haouamine A, a marine alkaloid. He earned his doctorate in 2009. He then developed a catalytic enantioselective [5+2] cycloaddition as an National Institutes of Health post-doctoral fellow with Professor Eric Jacobsen at Harvard University. He joined the Stanford Chemistry Department faculty in 2012, and was named a Terman Fellow in 2013.

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Selective Halogenation and the Study of Noncanonical Lipids

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Our group is particularly inspired by natural products not only because of their importance as synthetic targets but also due to their ability to serve as invaluable identifiers of unanswered chemical, medicinal, biological, and biophysical questions. One major focus of our research has been the selective halogenation of alkenes. Dihalogenation and halofunctionalization encompass some of the most fundamental transformations in our field, yet methods capable of accessing relevant halogenated motifs in a chemo-, regio-, and enantioselective fashion have been lacking. We are also interested in the practical total synthesis of halogenated and non-halogenated noncanonical membrane lipids. Progress, study, and applications in this vein will be discussed in detail.