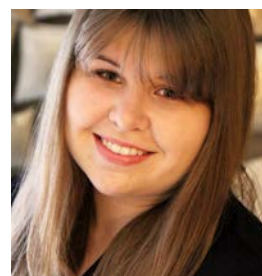


# 2017 Irving H. Wiesenfeld Fellow

**Melissa Hardy, UC Berkeley PhD Candidate in Chemistry (Synthetic Division), Sarpong Lab**

Melissa Hardy obtained her undergraduate degree in Chemistry and French from Grinnell College in 2016. After graduation, she moved to UC Berkeley's College of Chemistry to join the lab of Professor Richmond Sarpong and focus on the synthesis of biologically-interesting natural products. Melissa is currently working towards a total synthesis of two marine-derived natural products in order to study their efficacy as new anti-malarial therapeutics.



## **Fellowship Proposal**

With its first suspected outbreak in ancient China in 2700 BC, malaria presents a long-standing challenge for medicine and public health. While this disease has effectively been eradicated in certain areas, in 2015 there were still an estimated 212 million cases of malaria leading to 429,000 deaths worldwide. This high mortality cost is mostly associated with inaccessibility to proper treatment as well as increasing resistance of the *Plasmodium falciparum* parasite to available therapies. In fact, some strains of malaria observed in Southeast Asia are now resistant to even the most effective known treatments and, alarmingly, such strains are beginning to spread.

This growing resistance has led to increased interest in identifying novel medications that may possess an unprecedented mode of action. In this regard, the class of isocyanoterpene (ICT) natural products have been considered promising therapeutic candidates. These ICT natural products display not only high activity, but also good selectivity over human cells and a unique mechanism of action as compared to currently employed anti-malarial pharmaceuticals. This unique mechanism of action is particularly intriguing in the search for new anti-malarial therapies to which currently developed resistances cannot be conferred.

Given the promise of ICTs as anti-malarial agents, the goal of Melissa's work is to complete a short total synthesis to access 9-isocyanopupukeanane, 2-isocyanopupukeanane, and derivatives. In many drug molecules, small structural changes can have dramatic effects on the effectiveness of the drug. Thus, the goal of the project is to design a short synthesis that allows for efficiently making these two potential anti-malarial candidates as well as many similar compounds. All of these targets will then be tested for anti-malarial activity with the hope that the most active ones may eventually become effective treatments for malaria.