During my sabbatical, I performed electrochemical studies on copper bound in a His$_3$ coordination environment in peptides of the TRI family. In particular, protein film voltammetry was used to determine Cu(I)/Cu(II) redox potentials of the sites in the presence and absence of nitrite (NO$_2^-$). For TRI$_{L23H}$ copper, a midpoint potential ($E_m$) of ~ 0.46-0.49 V (depending on exact conditions) vs. NHE at pH 5.8 was determined from cyclic voltammetry experiments. A shift of the potential upon addition of NO$_2^-$ to a slightly larger value (~0.51 V) is observed, consistent with that observed for Cu nitrite reductase (CuNIR). The $E_m$ values in the presence and absence of NO$_2^-$ were also determined at pH 6.5, 7.5, and 8.5, with a general trend of decreasing potential to ~ 0.41 V at pH 8.5. Amperometric measurements at pH 5.8 were used to test for NO$_2^-$ reduction at 0 V vs. SCE, but results indicate that this could not be detected with electrocatalytic methods, likely because substrate turnover (if occurring multiple times) is too slow. Subsequent CV cycles indicate a loss of copper from the less stable oxidized state (consistent with the unusually high reduction potential for this site). Therefore, a design modification was made to the peptide to increase its stability (incorporating an extra heptad by using GrL30H) and the corresponding effect on the redox potential observed. Unfortunately very little, if any, effect was observed. Overall, the redox potential of the Cu site in these peptides is relatively high (for example, CuNIR has $E_m$ ~ 0.2 V), therefore stabilizing Cu(I). It is likely that future design efforts must be made to reduce this reduction potential in order to observe any significant catalytic activity. My sabbatical experience greatly enhanced my overall research and student experience (as well as my general living experience, given that I was in a different country). Learning a new technique in a separate lab in another country broadened my research knowledge and gave me new perspective on my research. Although the results I obtained created many more questions than I was able to answer during my time there, I will now continue to use the electrochemical techniques I learned at Oxford to hopefully gain further understanding of the electrochemical and chemical activity of Cu in peptides of the TRI family.