



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Rishi Shah	Project Number S0622
Project Title Analysis of UV Photodegradation of Moxifloxacin in Water Samples	
Abstract Objectives Moxifloxacin, a fluoroquinolone antibiotic, is an emerging water contaminant that is poorly removed by common water treatment processes. The objective of this research was to understand the degradation of moxifloxacin by direct UV photolysis and advanced oxidation processes involving UV/H(2)O(2) and UV/H(2)O(2)/Fe(II). Methods 0.15mM Moxifloxacin samples were radiated for 60 minutes in a UV reactor. 0.5 mL samples were taken at set timepoints during the radiation for analysis. Bovine liver catalase was added after every set timepoint for the UV/H(2)O(2) and UV/H(2)O(2)/Fe(II) experiments to prevent dark oxidation. All the samples were analyzed through high performance liquid chromatography (HPLC). Results Direct UV irradiation resulted in little to no degradation of moxifloxacin. UV/H(2)O(2) and UV/H(2)O(2)/Fe(II) treatments both resulted in moxifloxacin almost entirely degrading in the water samples. UV/H(2)O(2)/Fe(II) treatment resulted in faster degradation kinetics ($k = 0.0782$) compared to UV/H(2)O(2) treatment ($k = 0.0577$). Conclusions Treatment of water samples through advanced oxidation processes resulted in substantial degradation of moxifloxacin. These results suggest potential for photoinduced removal of moxifloxacin in water treatment plants. However, more research needs to be done in order to understand the products of degradation.	
Summary Statement I examined the degradation of moxifloxacin in water through UV, UV/H(2)O(2) and UV/H(2)O(2)/Fe(II) treatments.	
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