

“Ecological and Human Health Implications of Environmental Diclofenac”

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12.10-1.00 PM (MST)

Zoom Link

<https://zoom.us/j/93622297036>

Meeting ID: 936 2229 7036

Note: Presentation will be projected on Lopez 106 screen, interested faculty members and students are welcome to convene in Lopez 106.

Abstract: Diclofenac is a potential surface water contaminant. The environmental impacts of this pharmaceutical and its degraded products remain elusive. In this work, we focused on understanding the mobility of diclofenac in different ecosystems and its degradation mechanisms. Environmental minerals can play a significant role in these processes. Here, we studied the effects of two Fe-containing minerals, two titanium-containing minerals, and one clay mineral on the diclofenac mobility and photo-degradation. We carried out our adsorption experiments using FTIR spectroscopy and the degradation studies in custom-built glass reactors under simulated solar radiation. We quantified the diclofenac decay using HPLC and identified degradation products using LC-MS. Further, we assessed *in vitro* toxicological impacts of photo-degradation products on two human cell lines, HEK293T and HepG2. Our results showed that the diclofenac was pre-concentrated onto environmental minerals to increase its mobility in the environment. Biological assays confirmed that some photo-degraded compounds could be more toxic than the parent compound. Diclofenac and its degraded compounds can pose a risk to human health at low concentrations than higher concentrations. Overall, our data highlighted that mineralogy could significantly affect diclofenac mobility, degradation rate, and photo-degradation products. Thus, further studies on the potential risk of diclofenac degradation products in the environment are pivotal.

