Per- and polyfluoroalkyl (PFAS) contamination of irrigation waters in Albania

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Abstract

Per- and polyfluoroalkyl substances (PFAS), known as "forever chemicals", represent a large and complex class of man-made chemicals widely used in consumer and industrial products, such as fire suppressant foams, pesticide, non-sick cookware, leather, coating, glass cleaners and many more [1]. PFAS are persistent in the environment, they bioaccumulate, and are highly toxic to humans. Exposures to PFAS have been associated with neurobehavioral development, immune system impairment, endocrine disruption, disruption of lipid metabolism, diabetes and cancer [2]. PFAS are now found everywhere and almost on everyone [3]. *The status of PFAS environmental contamination in Albania is not known.* Our team is collaborating with the UMASS Lowell researchers to generate baseline data and identify PFAS contamination hot spots with focus on irrigation waters sources in Albania. We will collect samples (n=100) from surface waters (e.g. rivers, streams and reservoirs) and ground water systems (e.g. wells) utilized by large farms and greenhouses with high water consuming plants (e.g. strawberries). Samples will be analyzed at Dr. D Bello laboratory, UMASS Lowell, with liquid chromatography tandem-mass spectrometry (LC-MS/MS). Statistical analysis will be performed with SAS software to characterize PFAS concentrations and potential sources. We plan to extend our collaboration with other groups to investigate development of nanosensors including ion-selective electrodes, electrochemical sensors, fluorescence sensors and smartphone app-based monitoring systems that are both reliable and feasible [4-6]. *This work is funded by Research Expertise from the Academic Diaspora Fellowship (READ) program.*

References

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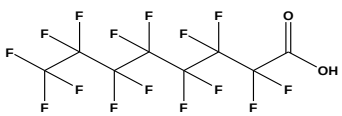

Figure 1. Chemical formula of perfluorooctanoic acid (PFOA)