Casparian Strip can Reduce PFAS Transport within Plants

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PFAS enter agricultural production systems primarily through irrigation with contaminated water supply and/or land application of biosolids in farmland as soil amendment. These practices raise significant concern regarding human exposure to PFAS, because many PFAS demonstrate to be taken up by crops during their growth and distributed throughout the plant from roots to shoots, and into the edible portions. This could lead to human exposure to PFAS via food chains. Further investigation of factors that instigate the accumulation and transportation of PFAS in plants is required to identify effective prevention and remediation measures. One such factor being considered is the Casparian strip. The Casparian strip, located in the plant root cell walls, functions as a barrier against contaminant uptake by impeding their transportation beyond the roots. In this study, model plant *Arabidopsis thaliana* wildtype and a mutant strain possessing an incomplete Casparian strip were examined to evaluate the role in the mitigation of crop uptake of PFAS. After 120 hours of uptake time, compared to the wildtype, the mutant strain maintained comparable transpiration rates and biomass at harvest. PFAS accumulation in roots was similar between these two types of *Arabidopsis*; however, significantly higher PFAS concentration was observed in the shoots of the mutant in comparison to that of the wildtype. The physiological structures of Casparian strip in *Arabidopsis* strains will be further examined with microscopic techniques to advance knowledge of the effects of Casparian strip on transport and distribution of PFAS in the plant.