# Death Acid structure determination by $^{1}H$ and $^{13}C$ NMR spectroscopy

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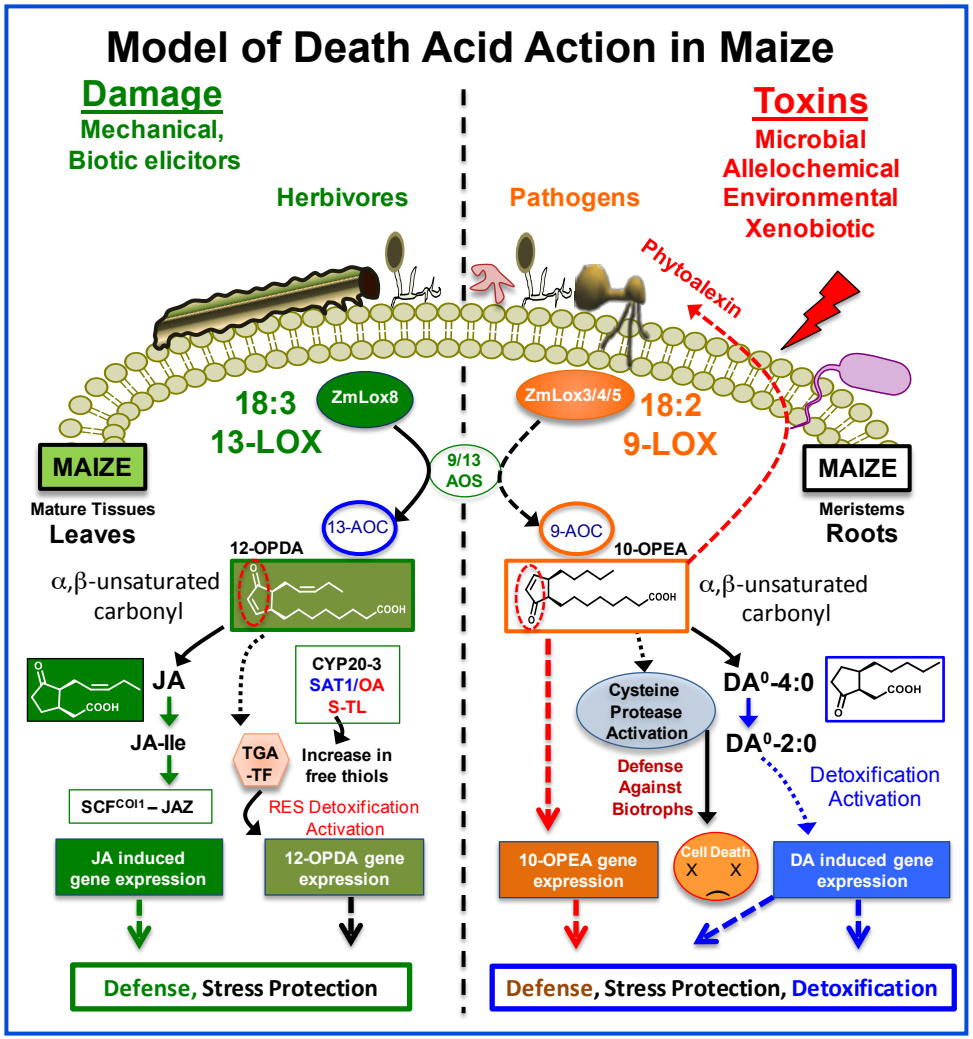
Plant oxylipins (oxygenated fatty acids) modulate development, reproduction, and innate immune responses against pathogens and pests. Researchers recently identified in fungal-inoculated maize leaves a series of oxylipins that are produced in dying necrotic tissue, collectively termed “Death Acids”. Death Acids appear in abundance within infected tissues, display direct antibiotic activity against pathogens, mediate defense gene expression, and can even promote programmed cell death.

One-dimensional and two-dimensional $^{1}H$ and $^{13}C$ NMR spectra of purified oxylipins were acquired at the McKnight Brain Institute, home of the MagLab’s Advanced Magnetic Resonance Imaging and Spectroscopy facility, from which the molecular structures were determined. Relative stereochemistry was determined by gas chromatography retention times based on an authentic standard of predominantly cis-10-OPEA (Larodan; Malmö, Sweden). Residual $CHCl_3$ was used to reference chemical shifts to $\delta(CHCl_3)$ = 7.26 ppm for 1H and δ C of 77.36.

In this study we describe a novel series of potent signaling compounds and elucidate previously unknown cell defense and cell death mechanisms. Understanding this biochemical pathway at the genetic level will predictably demonstrate essential roles in plant stress resilience and innate immune regulation.




**Facility:** Advanced Magnetic Resonance Imaging and Spectroscopy

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