

g	Acute toxicity to some fish and aquatic invertebrates
g	Highly toxic to bees and some species of fish

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aldehyde production in:

state Michaelis–Menten kinetics.⁷ for the wild type isoform of 4-coumarate:CoA ligase, the bottleneck and significantly slower than the wild type backup of cinnamic acid (Fig. 3). Other potential solutions to get around the bottleneck are 1) To use a higher concentration of the wild type isoform 2) To use a mutant enzyme with a lower K_m (Fig. 5) or 3) To 10x increase the concentration of 4-coumarate:CoA ligase (Fig. 6). We chose the mutant 4-coumarate:CoA ligase, the backup of cinnamaldehyde (4). The mutant is selected for based on a 2000 paper from the University of Illinois Institute who altered three polar amino acids and discovered the K_m of 4-coumarate:CoA ligase, increasing the mutant's substrate concentration of the mutant isoform 10x, the flux is even more than the wild type. This is the most ideal situation for high yield production. We chose to investigate all three of the above conceived reaction kinetics were modeled using a hypothetical model for the reverse reaction. No real world data exists characterizing the reaction kinetics of the aforementioned enzymes. This me