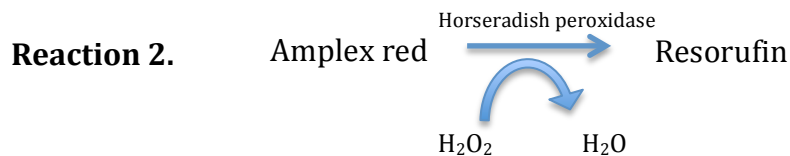
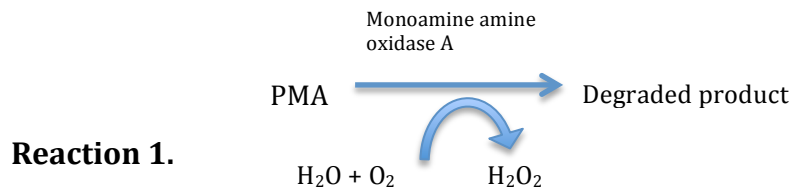


Finding the limit of detection for the PMA biosensor.

The LDLo (Lethal dose low) of para-methoxyamphetamine (PMA) in humans is 143mg/kg.

Even though the lethal dose for PMA is fairly high, our biosensor for PMA detection is highly sensitive as it uses amplex red reagent, allowing for detection of very low levels of PMA.



The PMA biosensor is a binary detection system, so a colour change means there is PMA present. We wanted to know the minimum amount of hydrogen peroxide that would produce a colour change detectable to the human eye. To find this we performed serial dilutions deriving different hydrogen peroxide concentrations that we then reacted with amplex red/HRP reagent. The results are demonstrated in figure 1.



Figure 1. 50 μ l of Amplex red and HRP was added to 50 μ l of hydrogen peroxide. From left to right the concentration of hydrogen peroxide was 2.5 μ M, 1.25 μ M, 0.62 μ M, 0.31 μ M, 0.15 μ M respectively. **The minimum limit of detection was determined as 0.31 μ M.**



Figure 2. A demonstration of the biosensor sensing 10 μ M of H₂O₂ with Horseradish peroxidase and amplex red on the bioactive zones. 20 μ l of the hydrogen peroxide containing solution was added to the application zone. Time to detection was 3 minutes.