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Impacts of the cytochrome p450 enzymes on drug resistance of *Acanthamoeba castellanii*

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Acanthamoeba is a free-living parasite present in rivers, lakes, seawater and soils that can cause severe infection, such as Granulomatous Amoebic Encephalitis (GAE) and Amoebic Keratitis (AK). Two main stages can be recognized in the life cycle of *Acanthamoeba castellanii*: the trophozoite and the cyst. Since the transformation process from a trophozoite into a cyst, also called encystation, plays an important role in resisting extreme physical and chemical conditions for *Acanthamoeba* cell survival. Therefore, we tried to figure out the difference between these two stages by collecting the trophozoites and encysting samples for transcriptomic high-throughput surveys. According to the transcriptome analysis, we found out several cytochrome P450 and antibiotic biosynthesis related genes expressed higher in the cyst form. Cytochromes P450 (CYPs) are proteins of the superfamily which is necessary for the detoxification of foreign chemicals and the metabolism of drugs which might be an essential process to against potential toxicity from the environment that *Acanthamoeba* uptake. Since previous studies have shown that CYPs play a role in drug metabolism and therefore we will try to use different expression vectors to express CYPs in both prokaryotes and eukaryotes and followed by drugs treatment to investigate the effects of CYPs. To sum up, these findings may not only provide us with a better understanding of CYPs in *Acanthamoeba* but also provide insight into the development of treatment for AK.

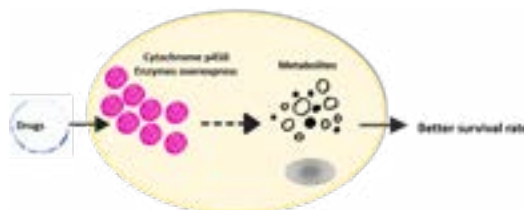


Figure: Overexpress cytochrome P450 enzymes will increase *Acanthamoeba castellanii* survival rate after drug treatment.

Biography

Pin-Ju, Ko is a second-year master's student now, who is majored in parasitology. She has focused on drug metabolism, especially cytochrome P450 enzymes. Base on her research which may provide a better understanding of CYPs in *Acanthamoeba* but also provide insight into the development of treatment for AK.

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