Researchers at the University of South Florida have characterized the virulence factor Nfa-1 and its analog found in the fatally pathogenic amoeba, *Naegleria fowleri*, and *Acanthamoeba castellanii*, along with methods to inhibit these pathogens using apocynin and allopurinol.

Free-living pathogenic amoeba cause serious diseases, such as amoebic encephalitis, which can be fatal without treatment. Nfa-1 is known to be a virulence factor found in the amoeba *N. fowleri*, in which the NAD(P)H oxidase enzyme complex releases reactive oxygen species as part of the amoeba’s pathogenicity and rapid fatal progression of the infection. Hence, drugs that would inhibit the specific enzyme Nfa-1 can treat the pathogenicity caused by the amoeba.

Our inventors identified Nfa-1 as a virulence factor and characterized its biochemical activity that is responsible for the severe cytotoxicity of these infections. They have also determined specific inhibitors that can reduce amoebic pathology and cytotoxicity by up to 95%. Furthermore, our inventors have developed methods to use both apocynin and allopurinol to inhibit the cytotoxicity of *Naegleria fowleri* infection. Another set of methods have been developed by the inventors to hinder the pathogenesis of *Acanthamoeba keratitis* caused by *A. castellanii* using apocynin administered to the eye. In light of a lack of methods and specific inhibitors currently available that could quickly kill these pathogens, this novel invention will be of great therapeutic value.

**Inhibitors of Oxidase Virulence Factor Protect Against Pathogenic Amoebas**

**ADVANTAGES:**
- FDA approved drugs identified as inhibitors
- Release of toxic reactive oxygen species is inhibited
- Inhibition of Nfa-1
- Novel methods to inhibit the pathogenicity of *Naegleria fowleri* and *Acanthamoeba keratitis* causing *A. castellanii*

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