Clinical Implications of *Acanthamoeba* Affinity for Electric Fields

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*Acanthamoeba* keratitis (AK) has been most commonly related to careless contact lens (CL) handling and/or minor contaminated corneal abrasions. The treatment of AK has been characterized by the complexity of virulence and resistance profiles expressed by the protozoa in different layers of the corneal tissue and the toxicity of antimicrobial compounds used in the ophthalmologic routine for a long period of therapy. Furthermore, a delay in diagnosis may lead to the need for high-risk corneal transplantation and/or may result in eventual blindness. For these reasons, the establishment and development of preventive measures and procedures are of major importance in the control of the disease. The relevance of electrophysiology application in the ophthalmology and visual sciences fields, focused on main aspects of clinical and basic research on the corneal surface, has been reported. In this issue of *IOVS*, Rudell and colleagues elegantly show that *Acanthamoeba* trophozoites significantly respond to electric fields (EFs). The voltage dependence relation is also demonstrated. The authors are able to show the ability of trophozoites to migrate directionally toward the cathode; these results could lead to relevant further studies related to the application of electrophysiology in animal models of *Acanthamoeba* keratitis. Once the application of EFs induced the migration of trophozoites from deeper layers of cornea and consequently increased the exposure of trophozoites to antimicrobial compounds out of the corneal stroma, the researchers should feel encouraged to develop further studies in this field of science focused on in vivo assays related to the electrophysiology in *Acanthamoeba* keratitis. The findings could also provide a better understanding concerning the radial neuritis and/or corneal nerve alterations caused by the activation of inflammatory cascade due to the presence of *Acanthamoeba* trophozoites around the surface of corneal nerve, which is negatively charged in nonmyelinated nerves during the process of membrane depolarization followed by electrical pulse. In summary, the article by Rudell and collaborators presents impressive scientific information to provide translational and reverse translational approaches concerning the electrophysiology of *Acanthamoeba* cysts and trophozoites. Furthermore, the findings described in the manuscript could open new perspectives for therapeutic approaches in *Acanthamoeba* keratitis.

References


DOI: 10.1167/iovs.13-12486
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www.iovs.org | ISSN: 1552-5783