



Lisbon School of Health Technology | Park of Nations



# TEMPH 2014

TRENDS IN ENVIRONMENTAL MICROBIOLOGY FOR PUBLIC HEALTH

18 - 21 SEPTEMBER 2014

[WWW.TEMPH2014.COM](http://WWW.TEMPH2014.COM)

## **Possible role of *Acanthamoeba polyphaga* in Human Adenovirus protection against water chemical disinfection**

**Carducci A.<sup>1\*</sup>, Di Giuseppe G.<sup>2</sup>, Verani M.<sup>1</sup>**

<sup>1</sup>Laboratory of Hygiene and Environmental Virology, Department of Biology, University of Pisa, Pisa, Italy

<sup>2</sup>Protistology-Zoology Unit, Department of Biology, University of Pisa, Pisa, Italy

\* Prof. Annalaura Carducci – email: [annalaura.carducci@unipi.it](mailto:annalaura.carducci@unipi.it) - Tel. +390502213646

**Introduction.** Free-living amoebae have been recovered in aquatic environments and they may act as reservoirs or vehicles of various microorganisms living in the same environment by phagocytosis, without killing them. In this work it was studied the interaction in water between *Acanthamoeba polyphaga* (AP) and Human Adenovirus (HAdV), proposed as indicators of water viral contamination for their high environmental resistance, in order to highlight the role of protection from chemical disinfection of internalized virus.

**Methods.** In the first part of the study a series of experiments were performed to standardize a methodology for virus-amoeba “co-cultivation”: a series of solutions formed by water, AP and HAdV were co-cultured together and the viral uptake was assessed by direct immunofluorescence. In a second series of experiments, the disinfection efficacy of 3 different concentrations (5; 2.5 and 1 mg/L) of sodium hypochlorite against AP and HAdV either singly or when co-cultured was assessed.

**Results.** The data obtained by the co-culture trials demonstrated that HAdV was incorporated into the host amoeba confirming moreover a preference of prey size for it. In singly disinfection tests AP resulted more resistant than HAdV to chemical disinfection: amoeba still remained alive with 5 mg/L sodium hypochlorite while virus lost infectivity. In co-cultured trials, at this disinfectant concentration, we found HAdV in AP cytoplasm.

**Conclusion.** The results of the study confirm and underline the possible role of protection of *Acanthamoeba polyphaga* for Human Adenovirus type against chemical disinfection in water environment, revealing a new system of viral resistance.