The amoeba Acanthamoeba castellanii infection model

Commonly used acronym: *Infections using amoebae*

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Contact person

Charles Van der Henst

Organisation

Name of the organisation Vrije Universiteit Brussel (VUB)

Department Bio-engineering Sciences

Country Belgium

Geographical Area Brussels Region

SCOPE OF THE METHOD

The Method relates to	Animal health, Environment, Human health
The Method is situated in	Basic Research, Education and training, Translational - Applied Research
Type of method	In vivo
Used species	Acanthamoeba castellanii

Targeted organ system or type of research	Host-pathogen interactions, infection models, virulence of pathogens and drug discovery.

DESCRIPTION

Method keywords

host-pathogen interactions

cellular infections and host cell

pathogenicity

human pathogens and virulence

medium to high throughput infections

real time imaging

professional phagocytes

Scientific area keywords

Host-pathogen interactions

cellular infections

virulence assays and drug discovery

cytotoxicity assays

Method description

Amoebae are natural eukaryotic predators of bacteria, yeasts, fungi and they are ubiquiste. They are excellent and easy-to-use cellular infection models, as they allow to co-cultivate any organisms in a broad range of infection medium, compatible with high quality microscopy techniques, survival assays, drug screening methods. Amoebae are co-incubated with any organisms of interest using Petri dishes, multi well plate or on solid agar plates. Phagocytosis of non resistant organisms can be scored over time, and their potential intracellular behavior followed using basic techniques in microbiology.

Lab equipment

- Culture plates,
- Basic medium,
- Cellular biology equipment (no growth factor, no CO2 nor antibiotics are required).

Method status

Internally validated

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

- Cheap,
- Very easy to cultivate and maintain,
- No ethical issues,
- Published as "*in vivo*" infections,
- Compatible with real time microscopy techniques,
- Tolerate a high range of media, temperature and other environmental conditions,
- Established infection model,
- High throughput cellular infections,
- Interesting screening infection model.

Challenges

This is an infection model. It should be implemented with human macrophages or other *in vivo* infections.

Modifications

Not yet genetically tractable.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Van der Henst, C., Scrignari, T., Maclachlan, C. et al. An intracellular replication niche for Vibrio cholerae in the amoeba Acanthamoeba castellanii. ISME J 10, 897–910 (2016). https://doi.org/10.1038/ismej.2015.165

Van der Henst, C., Vanhove, A.S., Drebes Dörr, N.C. et al. Molecular insights into Vibrio cholerae's intra-amoebal host-pathogen interactions. Nat Commun 9, 3460 (2018). https://doi.org/10.1038/s41467-018-05976-x

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