The amoeba Acanthamoeba castellanii infection model

Commonly used acronym: *Infections using amoebae*
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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
This method makes use of	Other (e.g. bacteria)
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 CO_2 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

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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

Associated documents

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