

# The amoeba *Acanthamoeba castellanii* infection model

*Commonly used acronym: Infections using amoebae*  
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## SCOPE OF THE METHOD

<b>The Method relates to</b>	Animal health, Environment, Human health
<b>The Method is situated in</b>	Basic Research, Education and training, Translational - Applied Research
<b>Type of method</b>	In vivo
<b>This method makes use of</b>	Other (e.g. bacteria)
<b>Used species</b>	<i>Acanthamoeba castellanii</i>
<b>Targeted organ system or type of research</b>	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 ubiquitous. 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<sub>2</sub> 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., Scignari, 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>

### Associated documents

## PARTNERS AND COLLABORATIONS

### Organisation

**Name of the organisation** Vrije Universiteit Brussel

**Department** VIB-VUB Center for Structural Biology

**Country** Belgium

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**Geographical Area** Brussels Region

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