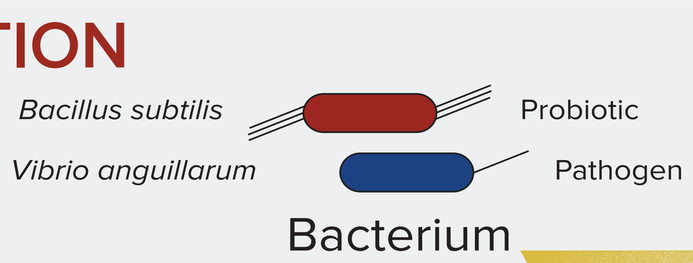
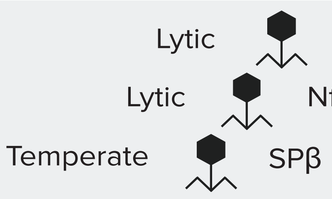
EFFECT OF MUCINS ON INTERACTIONS BETWEEN PROBIOTIC BACTERIA AND THEIR LYTIC AND TEMPERATE PHAGES

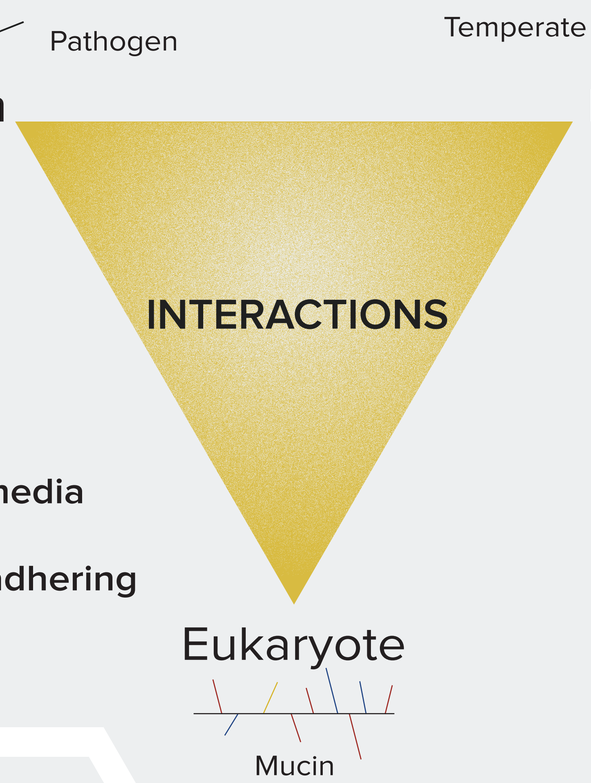
Jaka Jakin Lazar[1], Katarina Šimunović[1], Iztok Dogša[1], Ines Mandić Mulec[1], Jiří Pospíšil[2], Libor Krásný[2], Mathias Middelboe[3], Anna Dragoš[1]

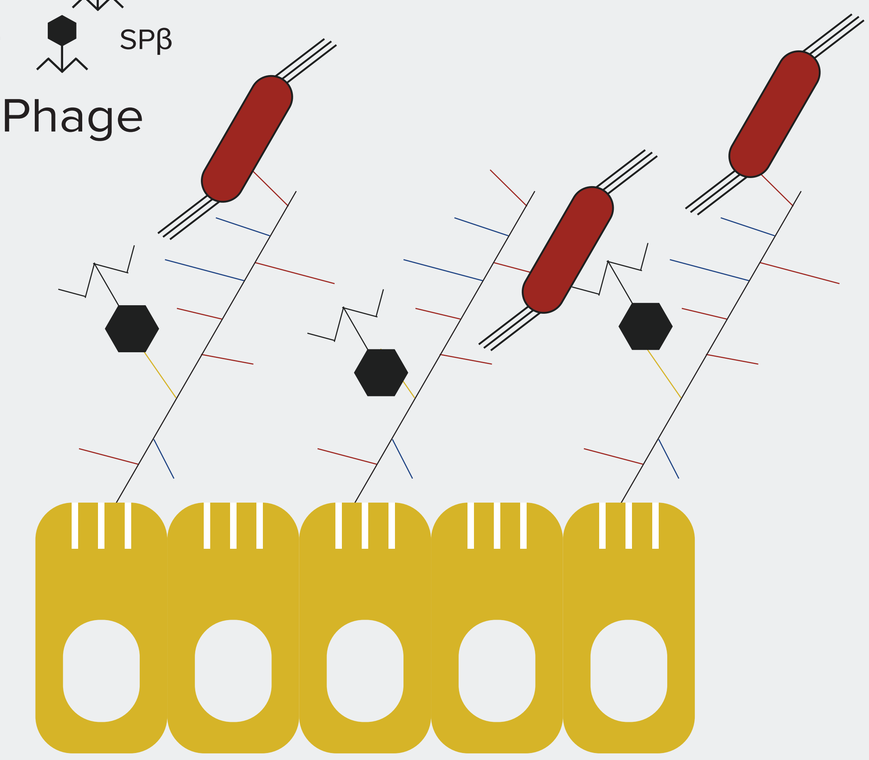
1 - Department of Microbiology, Biotechnical Faculty, University of Ljubljana, Ljubljana, Slovenia
2 - Institute of the Microbiology of the Czech Academy of Sciences, Prague, Czech Republic
3 - Marine Biological Section, Department of Biology, University of Copenhagen, Copenhagen, Denmark

INTRODUCTION








Adapted from Barr et al., 2013

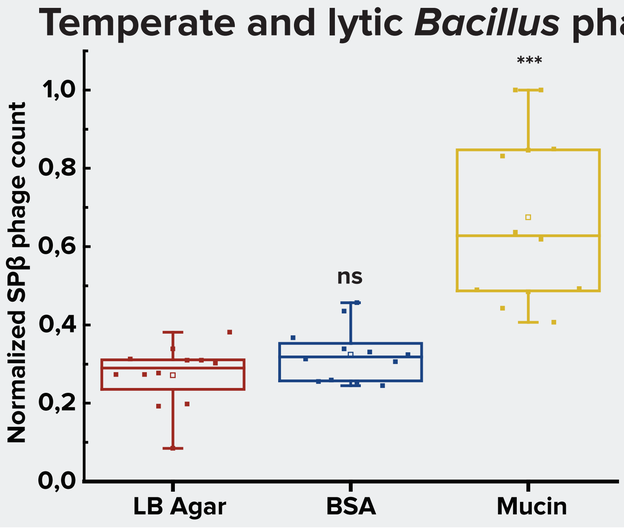
KEY CONCEPTS:

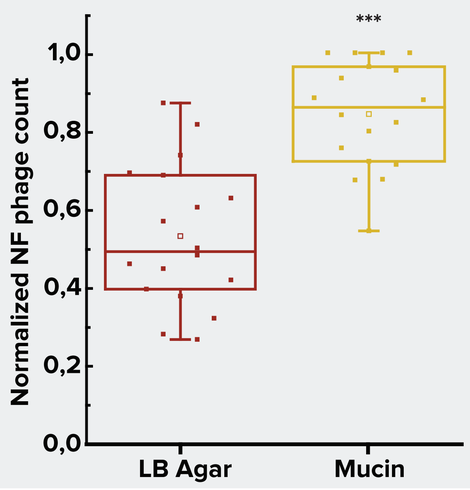
- Lytic phages infect and kill bacteria, while temperate phages can also integrate into the bacterial chromosome.
- Phage and bacteria co-inhabit mucosal areas.
- Mucus is a barrier for microbial infections.
- Mucin is the main component of mucus.
- *Bacillus subtilis* growth dynamic is different in a media with mucin.
- Phages provide a non-host-derived immunity by adhering to mucus.

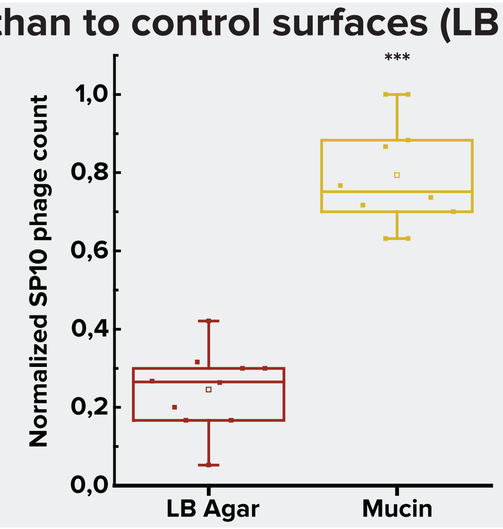
(Barr et al., 2013)

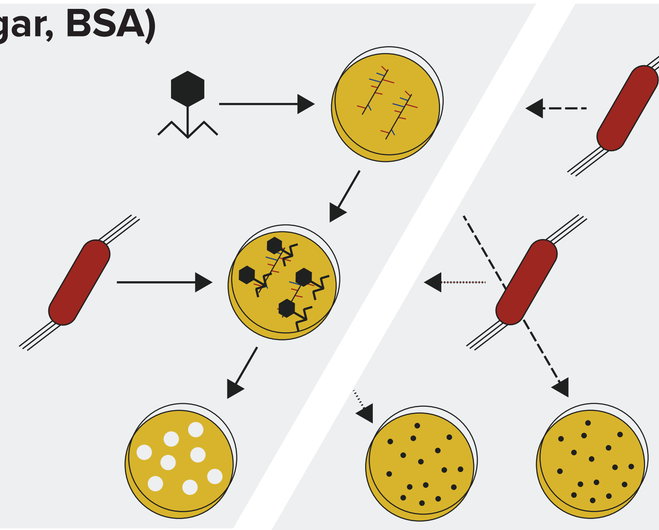
RESULTS AND DISCUSSION

Temperate and lytic *Bacillus* phages adhere to mucin more than to control surfaces (LB Agar, BSA)





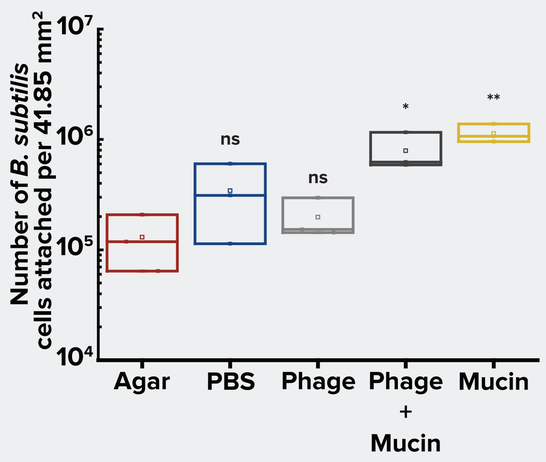


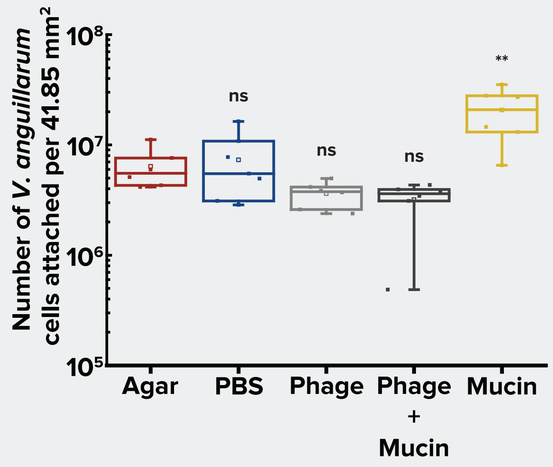


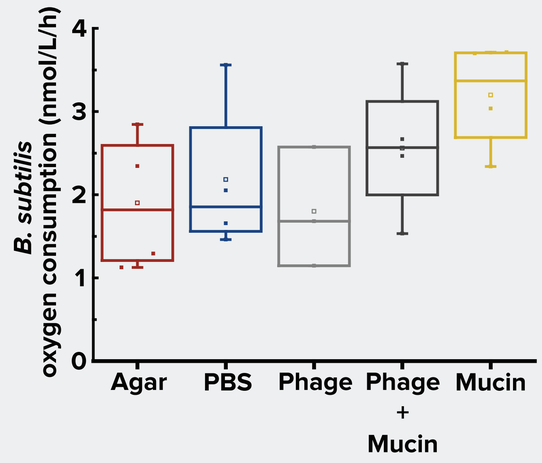
Mucin promotes bacteria surface attachment. Mucin affects phage-host interactions in *B. subtilis* and *V. anguillarum* differently

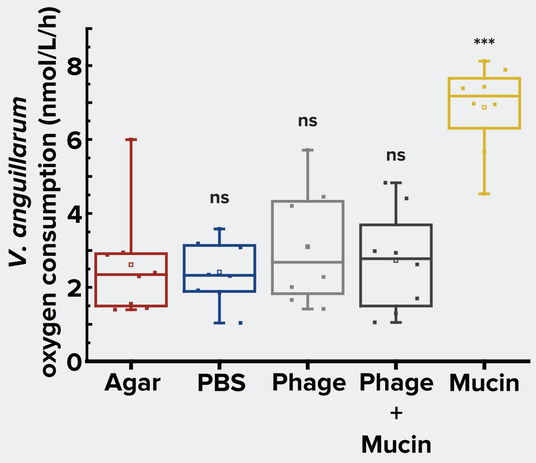
Mucin promotes surface attachment of *Bacillus subtilis* and *Vibrio anguillarum*. In the case of *B. subtilis*, but not in *V. anguillarum,* this effect persists even when lytic phages are attached to the mucin, which suggests that mucin shield certain bacterial species from phages.

The oxygen consumption of cells attached to different surfaces follows the same trend as results obtained for bacterial attachment. Mucins have favorable impact on both tested bacterial species, but negative effect of phages in presence of mucins is only significant for *V. anguillarum.*

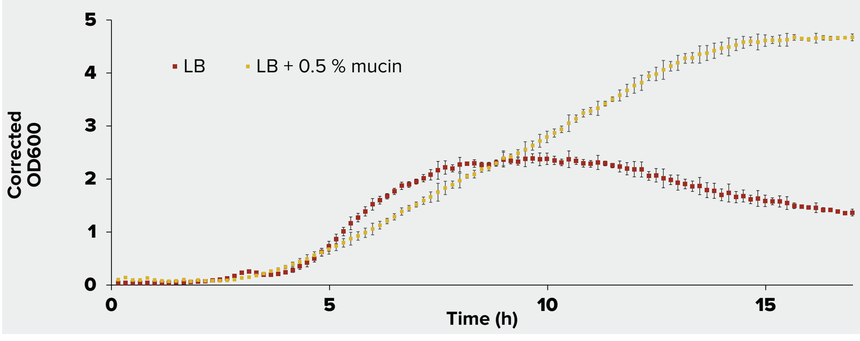


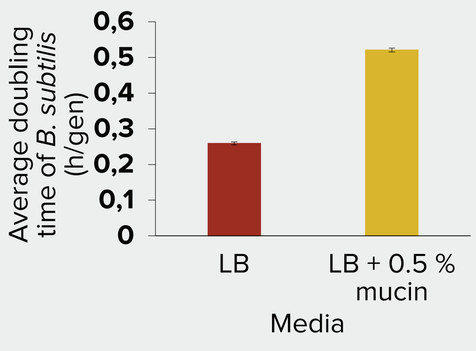


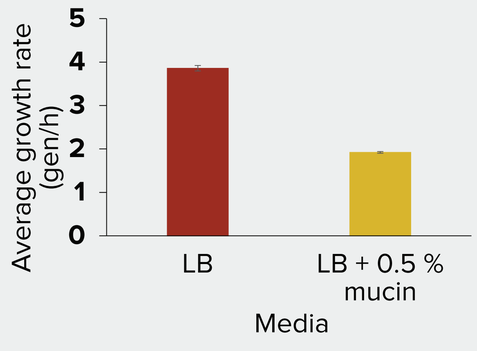


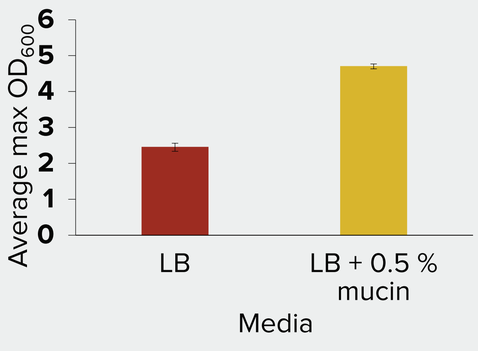


Mucin alters *B. subtilis* growth dynamics









CONCLUSIONS

Temperate and lytic phages adhere to mucin. Mucin promotes the attachment of *B. subtilis* and *V. anguillarum*. Mucin affects phage - host interactions in *B. subtilis* model system. Mucin protects *B. subtilis* from phage infection, but not *V. anguillarum*. Mucin's effects on phage-host interactions in *B. subtilis* may be linked to its effect on *B. subtilis* growth dynamics.

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Jaka.JakinLazar@bf.uni-lj.si | linkedin.com/in/bacteriophage

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PHAGECONTROL
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