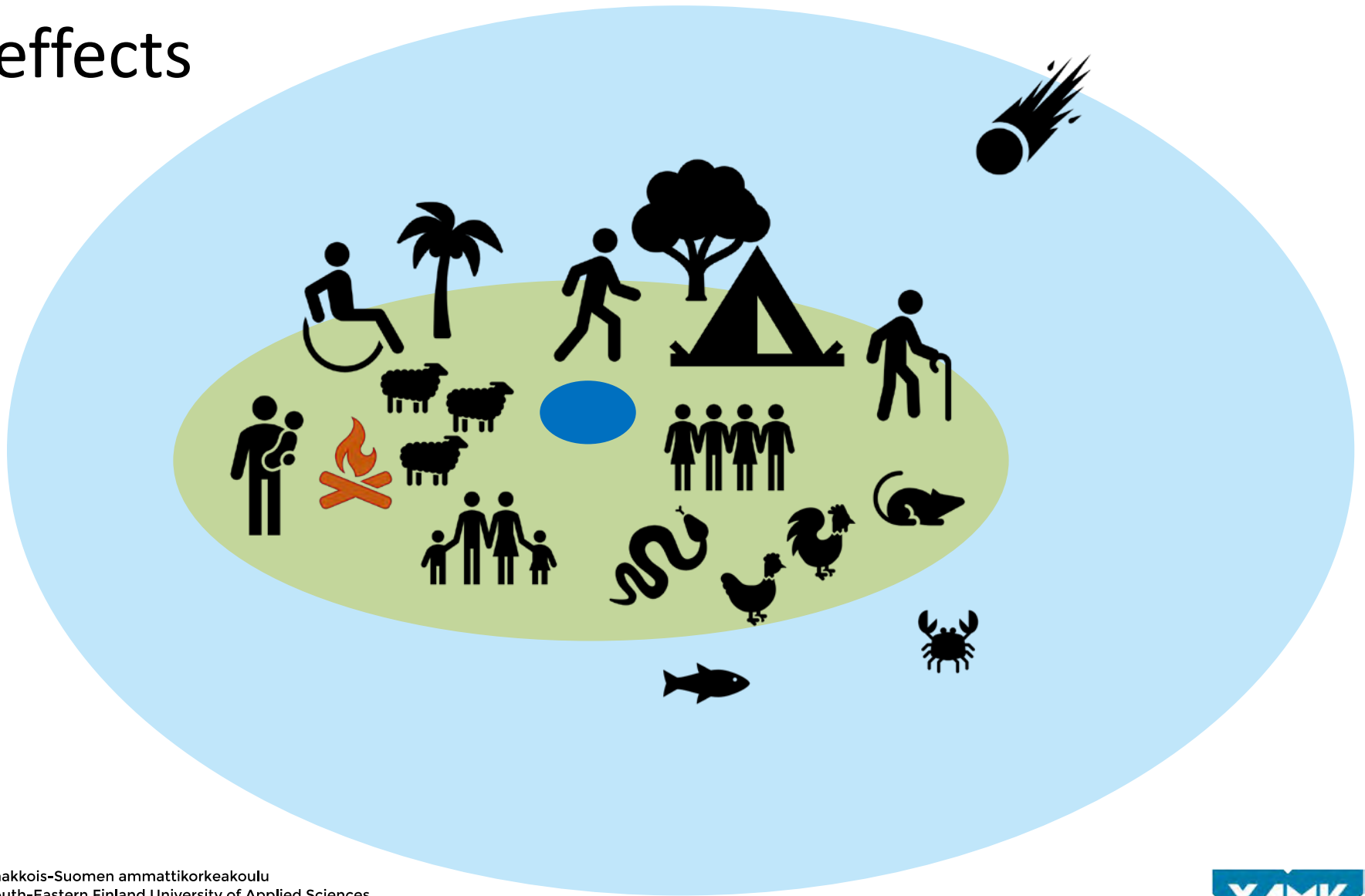


Anti-bacterial properties and functions of wood

March 7, 2019
Tiina Vainio-Kaila

Antibacterial effects

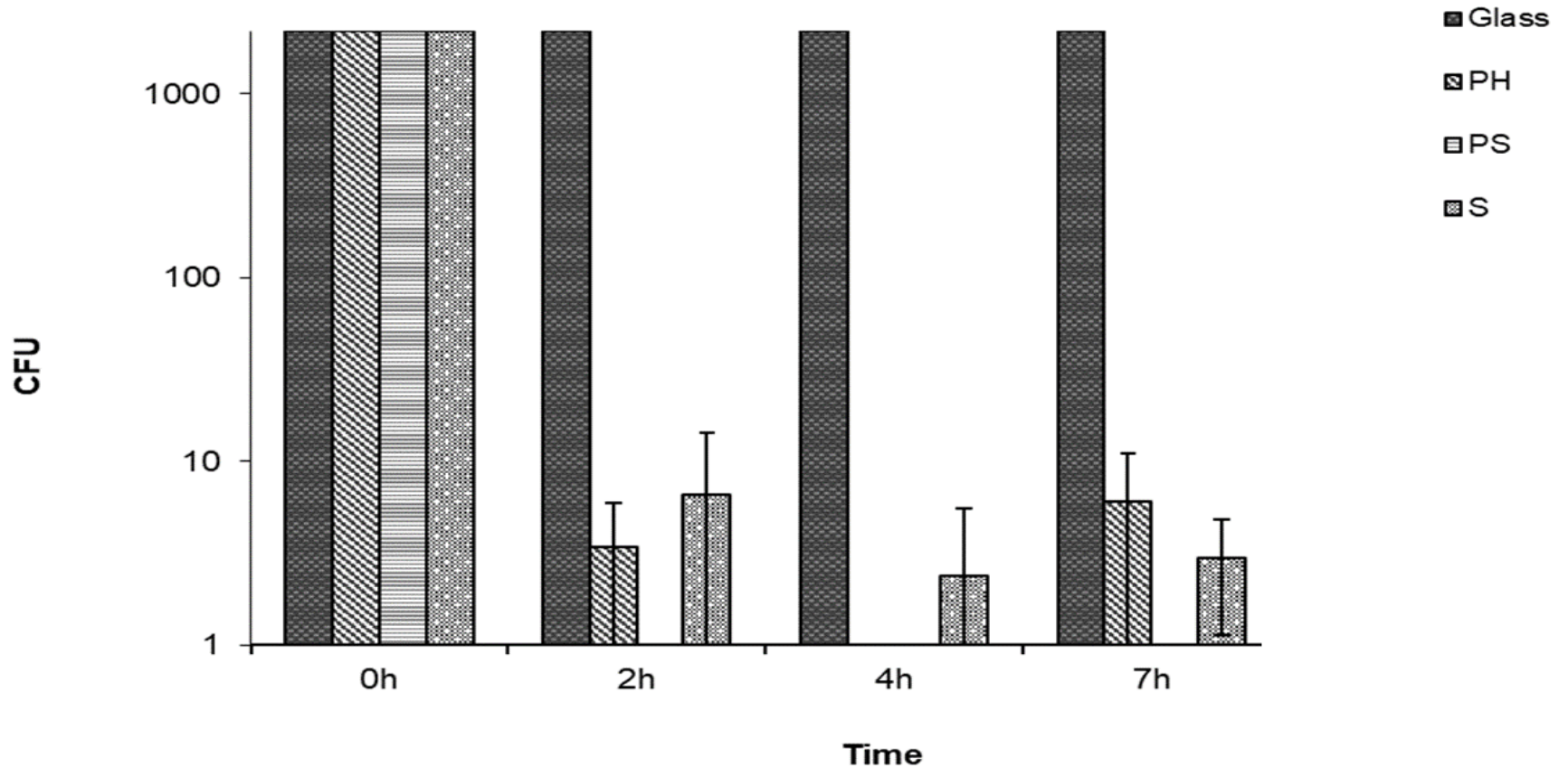


Bacteria on wood surface



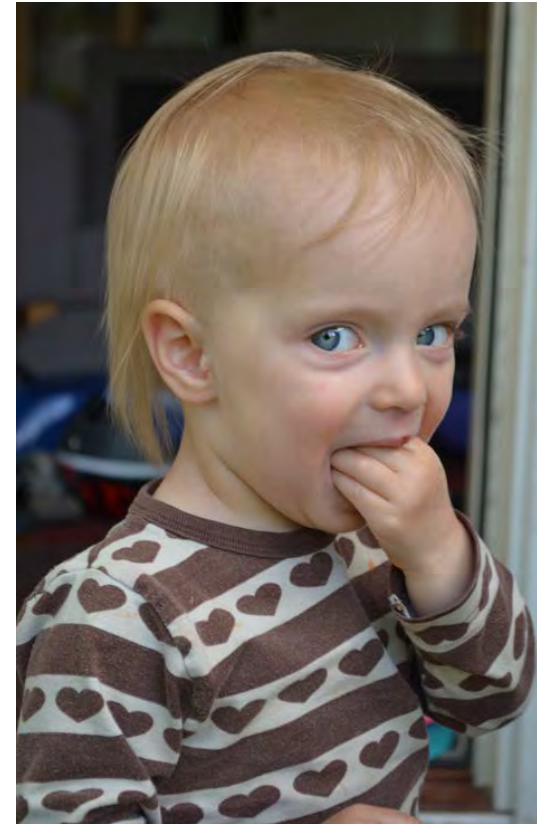
- *E. coli* and *Listeria monocytogenes* on Pine heartwood and sapwood, spruce heartwood and glass

E. coli on wood and glass surface



Could wooden surface be a good choice...

- ... for day care, with lot of touching and licking the surfaces?
- ... for elderly care homes, where immune resistance is lower?
- ... for hospitals, where there is bacteria and vulnerable people?
- Infections spread via surfaces
- Before answering these, some more questions need to be made



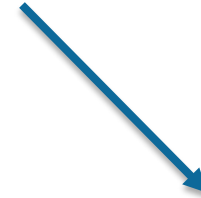
Antibacterial wood surface



How does the surface treatment affect?



More research needed!
Coming soon...



What happens when the surface is old?

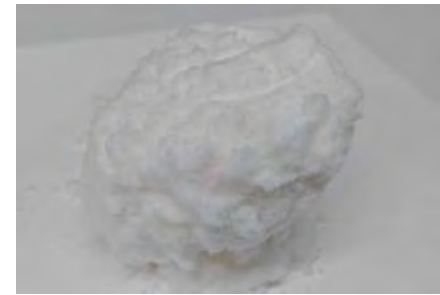


Let's take a closer look at the antibacterially

What makes wood antibacterial?

Wood is made of

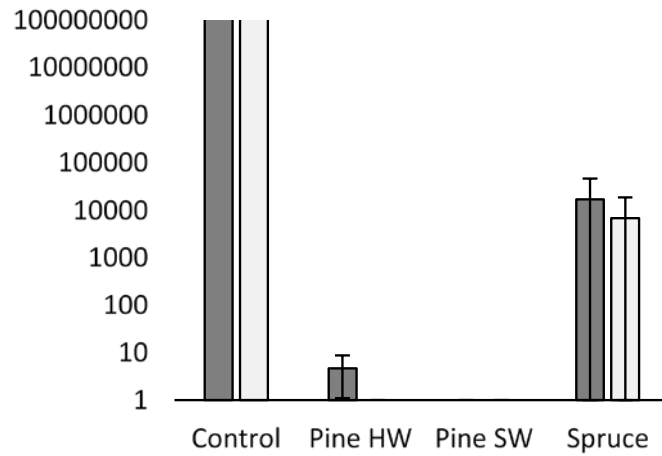
- Cellulose ~40%
 - Hemicelluloses ~30%
 - Lignin ~25%
 - Extractives ~5 %
-
- Wood extractives are very antibacterial
 - Lignin is antibacterial
 - Wood absorbs water, making surface dry faster



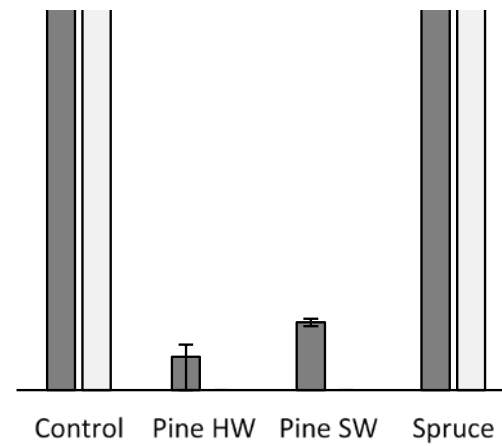
Spruce extracts + Vancomycin Resistant *Enterococcus faecalis*



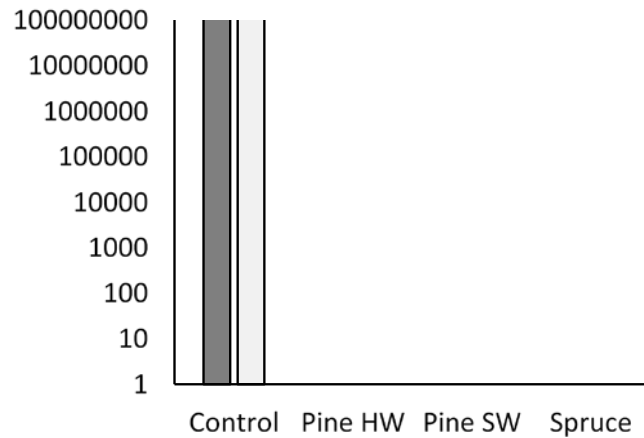
MRSA



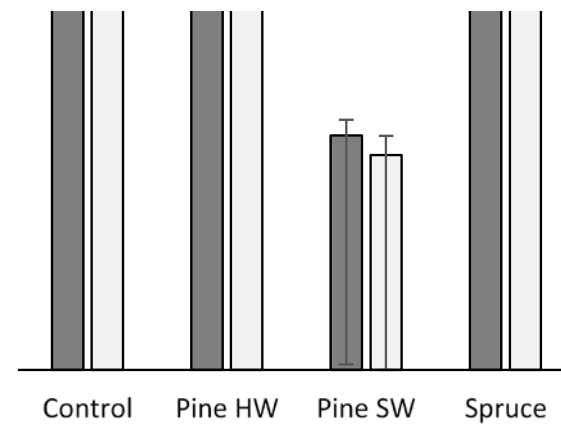
VRE



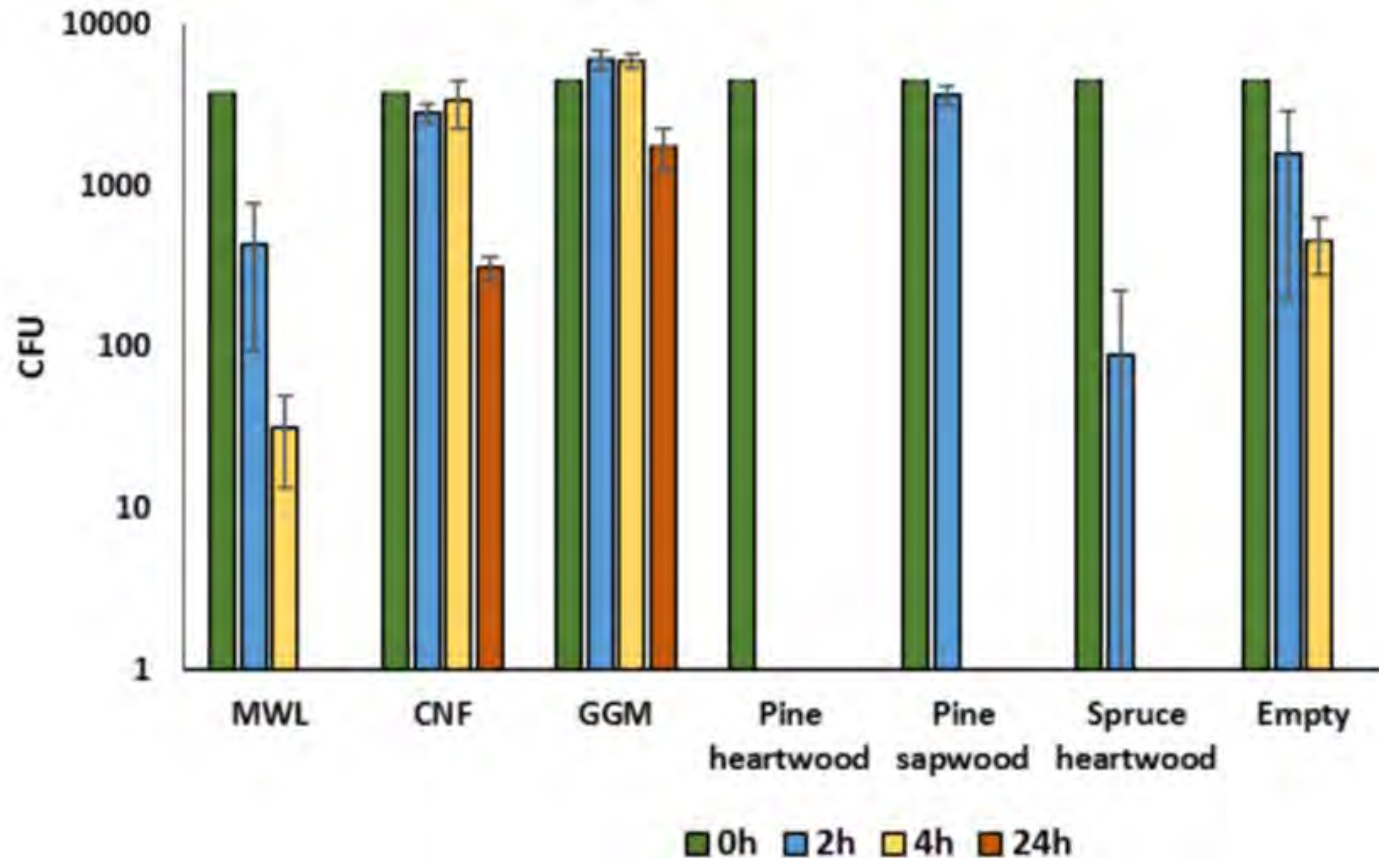
S. pneumoniae



E. coli



Wood components as model surfaces



MWL: Milled Wood Lignin
CNF: Cellulose Nano Fibrils
GGM: Galacto Gluko Mannan (Hemiselluloce)

Conclusions

- Wood surface is antibacterial
- This depends on extractives, lignin and the porous surface
- The extractives have a great potential
- Antibacterial surface can never replace proper cleaning

