

# Proinflammatory effects of bacterial cell wall of *Pantoea agglomerans*

## A possible explanation of airborne dermatitis to bioaerosols



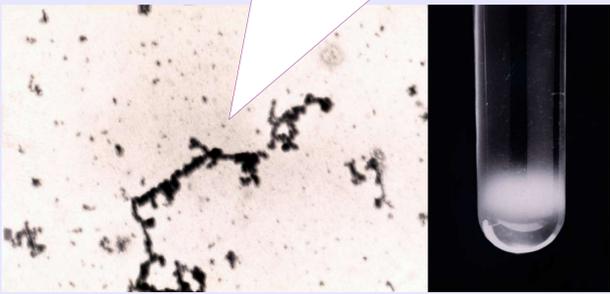
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### 1. Microvesicles & Bioaerosols

Microvesicles (MV) emerge from disruption of the outer wall of environmental Gram-negative bacteria and constitute a relevant fraction of bioaerosols.



### 2. Bioaerosols & the Skin

- Bioaerosol-related airborne dermatitis was reported e.g. in sewage workers
- Previously, we have described the relationship between airborne microbes and work-related skin symptoms and dermatitis in farmers (Spiewak R et al. Ann Agric Environ Med 2001; 8 : 255-259)



**3. Aim of the study**  
In vitro assessment of the immunomodulatory properties of microvesicles.



### 4. Methods

Microvesicles (MV) were prepared of the bacterial wall of *Pantoea agglomerans* (*Erwinia herbicola*).

Peripheral blood leukocytes (PBMC) of healthy volunteers were cultured with MV at various concentrations (from 0.48-1500 µg/ml).

Analyzed were: IFN-γ and TNF-α secretion (ELISA and ELISpot), proliferation (LPT), expression of CD8, CD14, CD16, CD25, CD69, CD80, CD83, HLA-DR and apoptosis markers (flow cytometry).

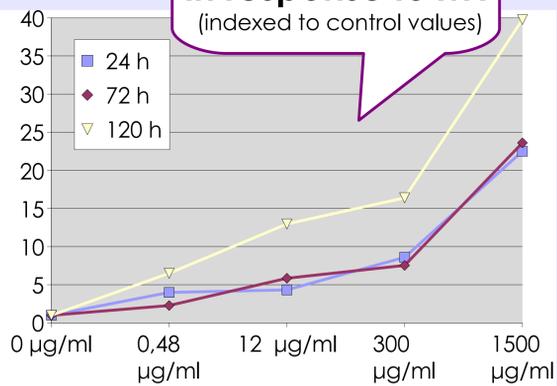
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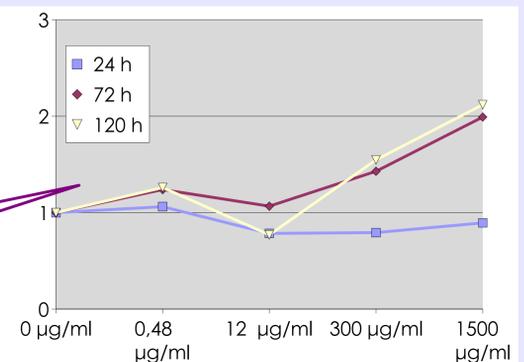
### 5. Results

- After 24 h, secretion of IFN-γ increased significantly (p=0.042) in a dose-dependent manner, starting with the lowest MV concentration.
- An increase in TNF-α production was observed only after 3 days at MV concentrations ≥ 300 µg/ml (p=0.050).
- A dose-dependent increase of cell proliferation was observed after 5 days of culture with MV (p=0.001).

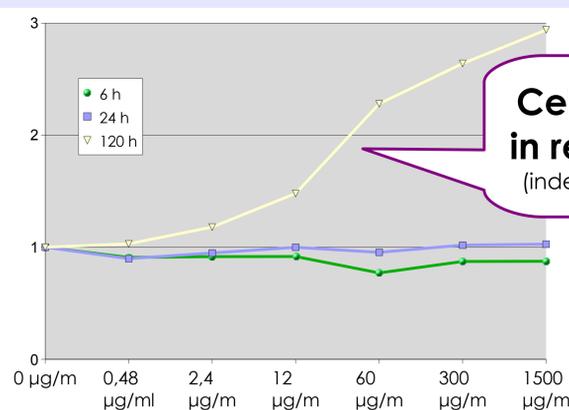
#### IFN-γ secretion in response to MV (indexed to control values)



#### TNF-α secretion in response to MV (indexed to control values)



#### Cell proliferation in response to MV (indexed to control values)



## Discussion:

- We have shown that microvesicles are biologically active in PBMC cultures in a dose-dependent manner.
- Increased IFN-γ secretion starts at the lowest MV concentrations.
- These results may explain the proinflammatory effect of bioaerosols on the skin.

