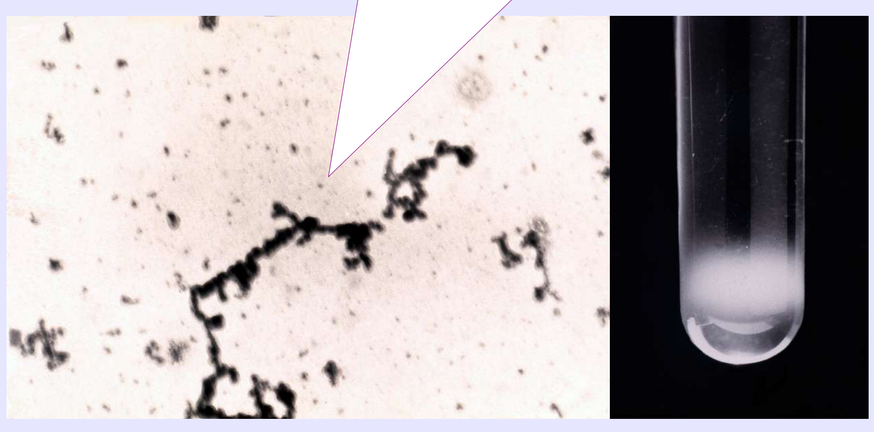
Immunomodulatory effects of the microvesicles from bacterial cell wall of *Pantoea agglomerans*. Different patterns of IFN-γ and TNF-α secretion

Radoslaw Spiewak
Celimun
Biomedical Research Laboratory
Krakow, Poland

Jacek Dutkiewicz
Institute of Agricultural Medicine
Occupational Biohazards
Lublin, Poland

1.

Microvesicles (MV) are spherical structures measuring 30-50 nm. They emerge from the disruption of the outer wall of environmental Gram-negative bacteria.



2.

- Microvesicles are suspected of inducing inflammatory lung diseases, e.g. in workers exposed to organic dusts.
- However, there also are interesting observations that people exposed to organic dust may be at lower risk of lung cancer.

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)*.

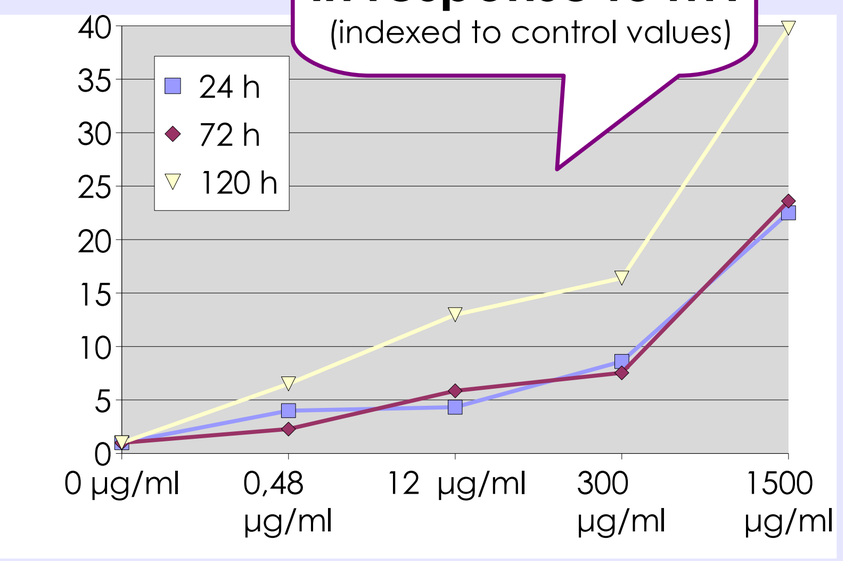
Peripheral blood leukocytes (PBMC) of healthy volunteers were cultured with MV at various concentrations (from 0.48-1500 µg/ml).

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).

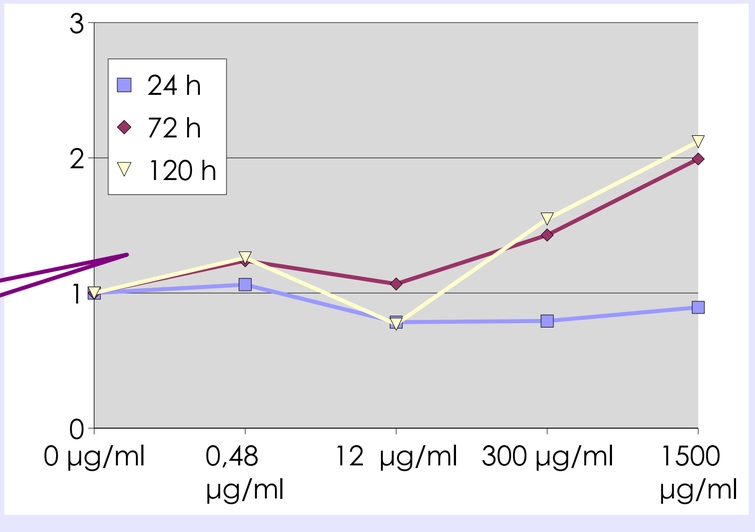
5. Results

- 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).

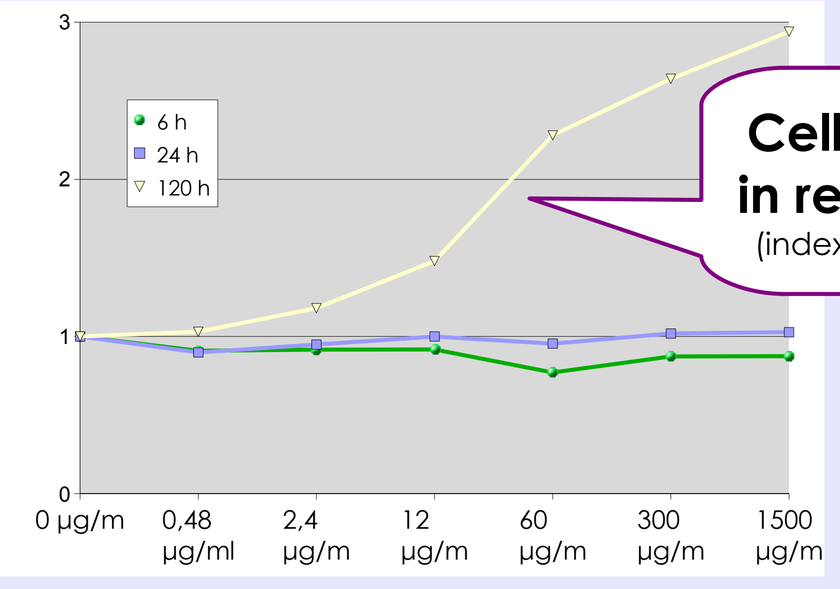
IFN-γ secretion in response to MV
(indexed to control values)



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



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



Conclusions:

Low MV doses → inflammation

- Increased IFN-γ secretion starts at the lowest MV concentrations.
- Increased TNF-α production starts at MV concentrations 600 times higher.

High MV doses → inflammation + anti-tumor effect

Contact:
Radoslaw.Spiewak@plusnet.pl
www.RadoslawSpiewak.net
www.celimun.biz