

Název: **PMPs-based isolation of H7N7
influenza serotype**

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Equine influenza (horse flu)

- 2 main serotypes: **H7N7** - A/equine/Prague/56
H3N8 - A/equine/Miami/63
- H7N7 last time isolated at 1979, but according to serological evidence still circulating in horse population.
- All of influenza isolated from horses over the past 30 years - H3N8 serotype.



Equine influenza (horse flu)

- Very high rate of transmission among specie.
- Short incubation time (1 – 5 days).
- Fever, hacking cough, runny nose.
- Recovery in two to three weeks.
- Vaccination, but flu was observed in both vaccinated as well in unvaccinated cases.

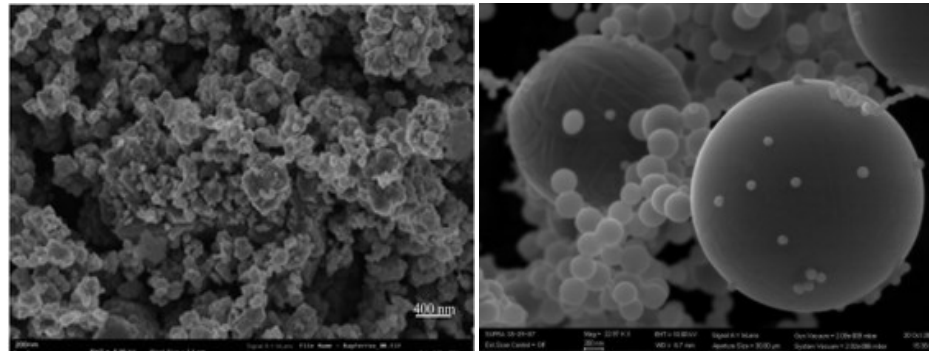


Why equine influenza?

- No zoonotic properties.
- Transmission described only between horses (*Equus caballus*), their hybrids with donkey (*Equus asinus f. domestica*) and dogs (*Canis lupus f. familiaris*).
- Higher stability than other serotypes.
- Susceptible to detergents and disinfectants.

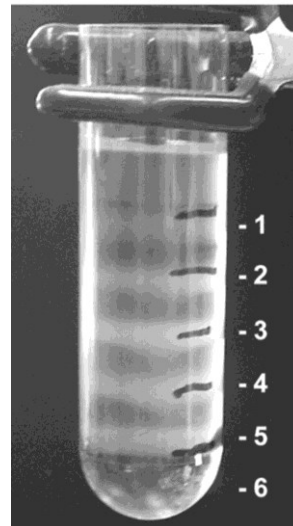
AIMS

- Synthesis of paramagnetic microparticles able to bind influenza virions.
- Confirmation of successfully binding of H7N7 to composite.



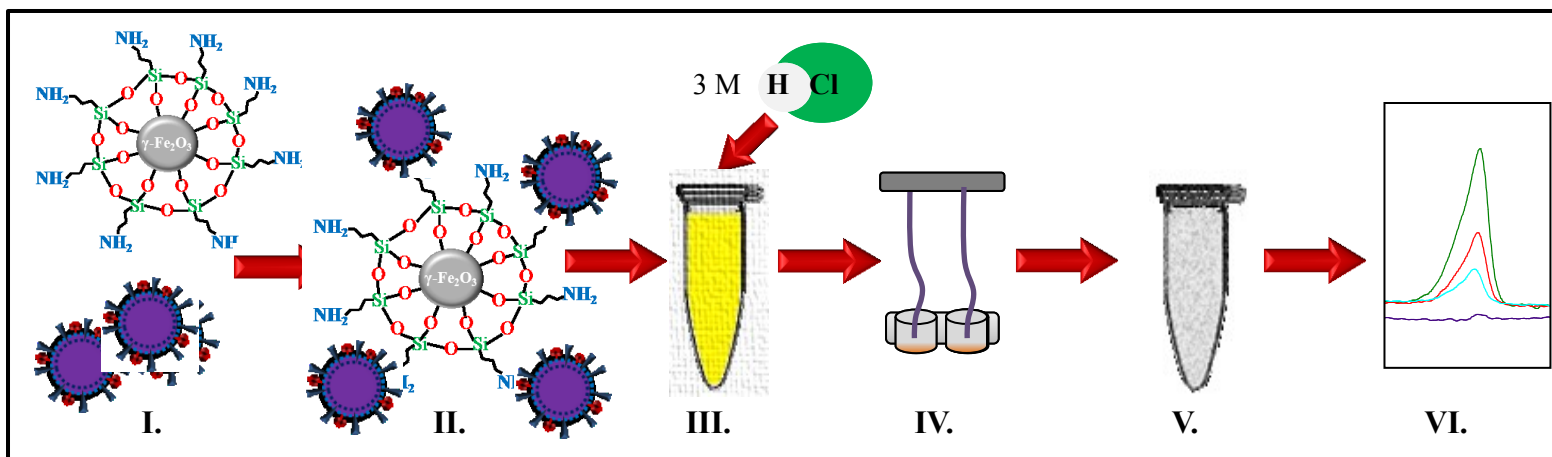
Results

- Optimization of ultracentrifuge (sucrose gradient) isolation of virions – few problems?



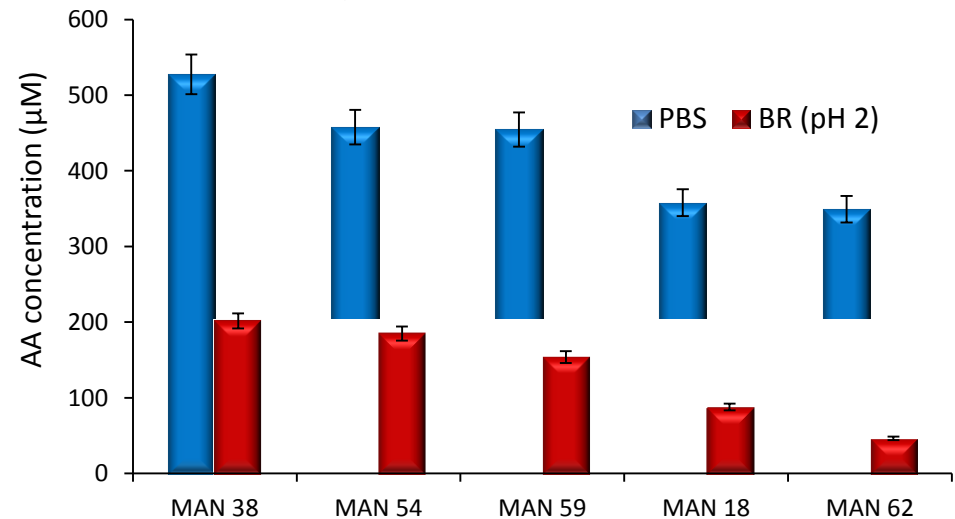
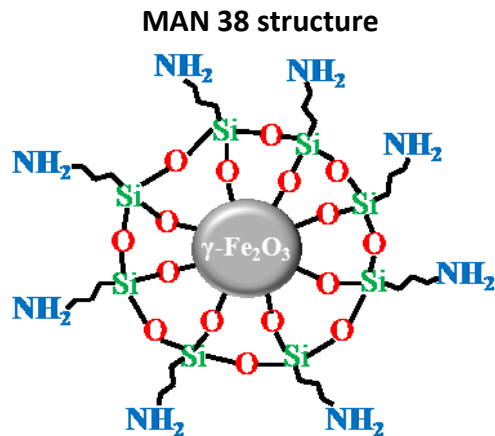
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Results

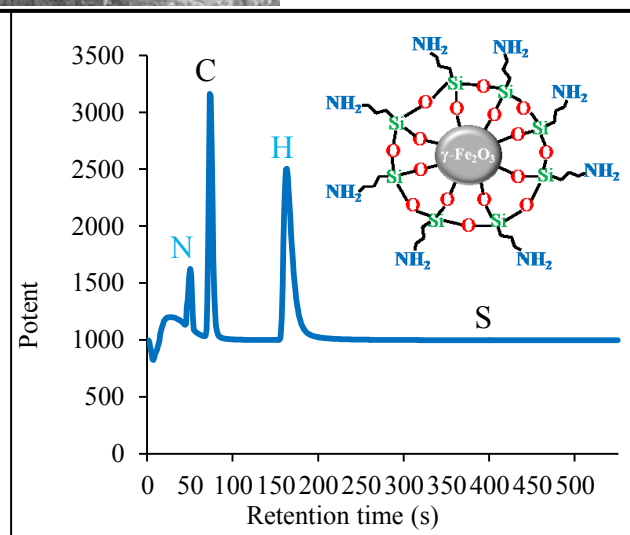
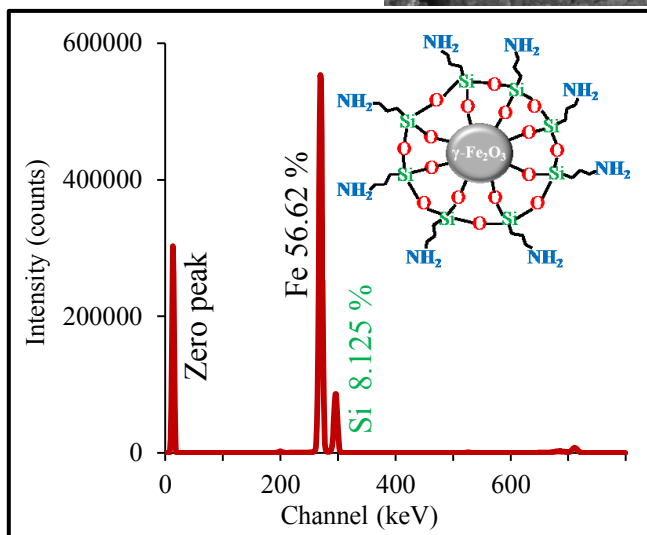
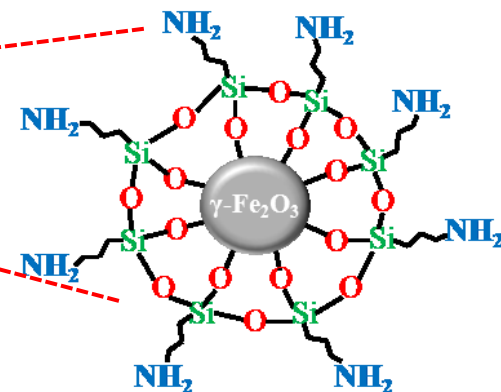
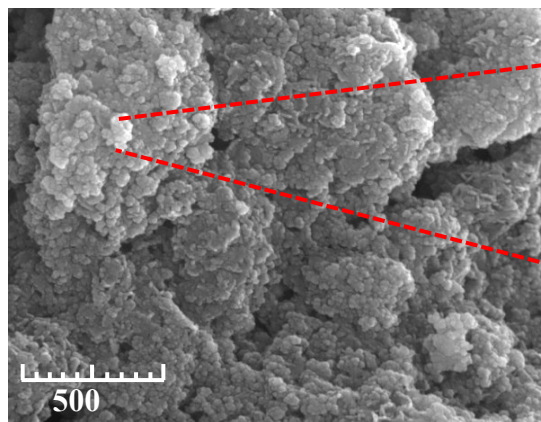


Results

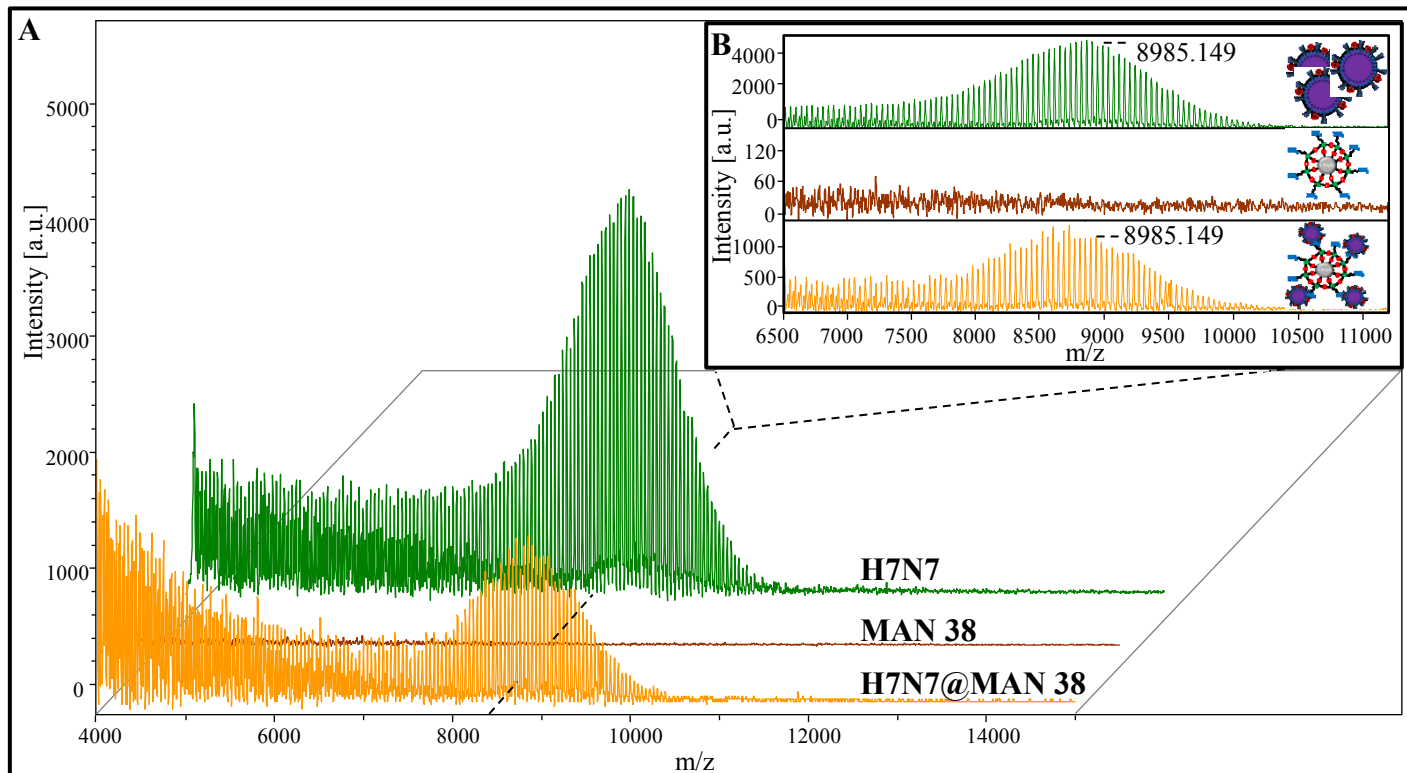
- Previously we have optimized the conditions for PMPs utilization, using BR buffer (ph 2) for washing of particles and protonation of analyte (Zitka *et al.*, Electrophoresis).
- PBS - higher yields.



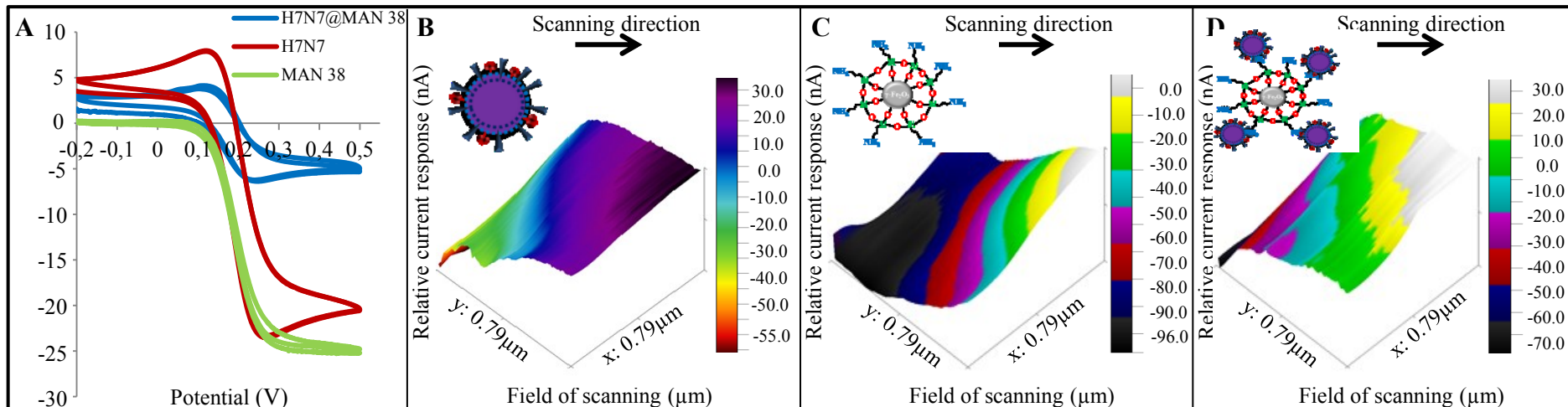
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SECM analyses



Conclusion

- PMPs able to establish a binding with H7N7 virions were synthesized.
- MAN 38 were characterized and workflow process optimized.
- H7N7 presence was confirmed.

Future outlooks

- Improvement of virions isolation (ultracentrifugation).
- PMPs application (i. e. Lab-on-a-chip platform or biosensor – 3D printing device).
- Rapid and cheap detection of influenza – probably without determination of subtype (screening).

Acknowledgments

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Thank you for attention