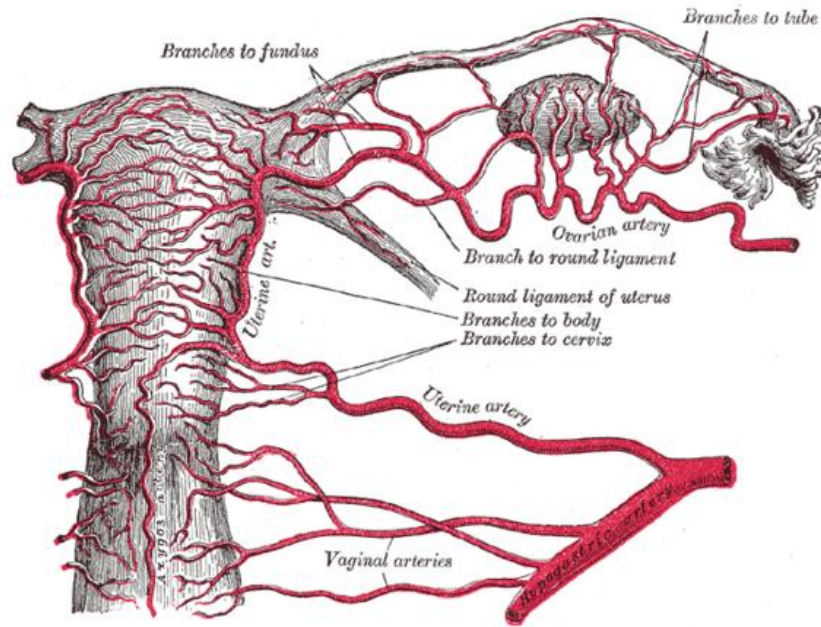
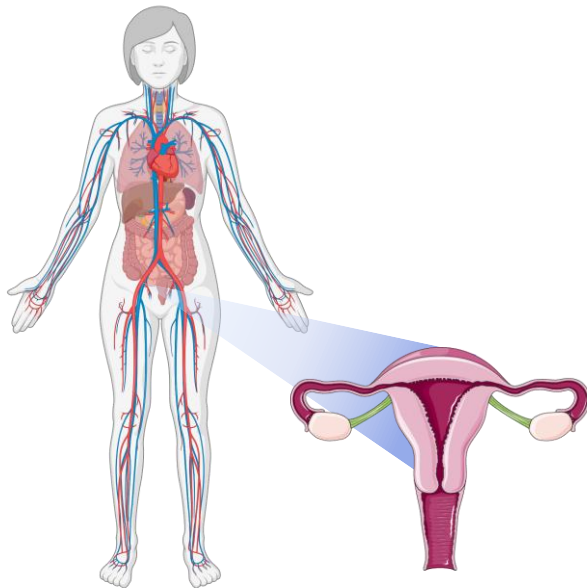


Quantifying the impact of the mucin protein corona on nanoparticles in the female reproductive tract

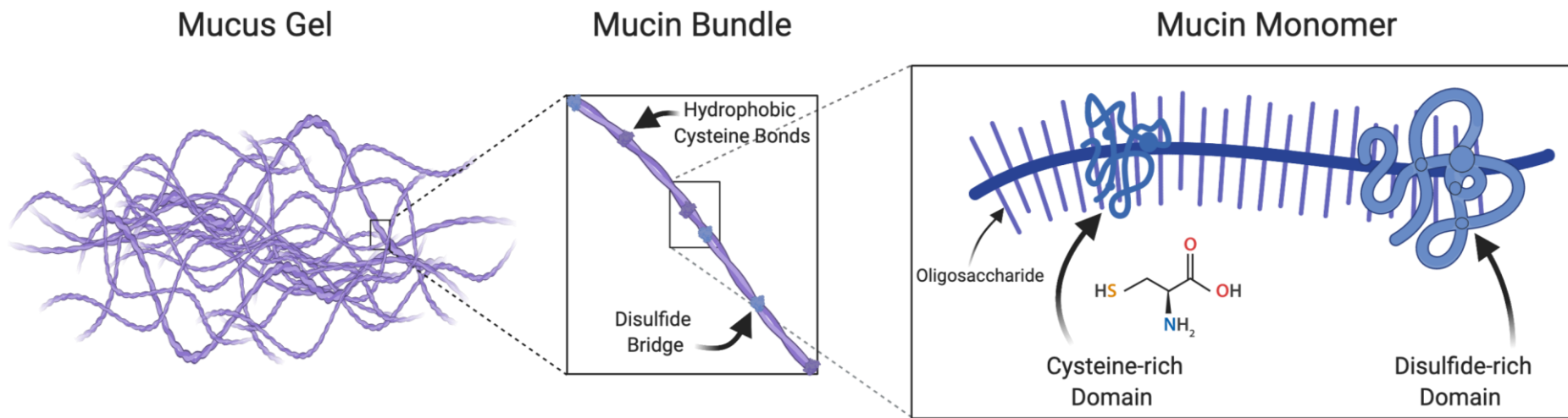
Alyssa P. Petersen
University of Maryland, College Park



Vaginal drug delivery is ideal for targeting the female reproductive tract

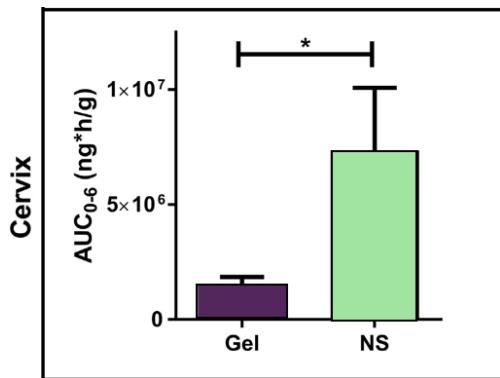


Mucus acts as a barrier to drug delivery

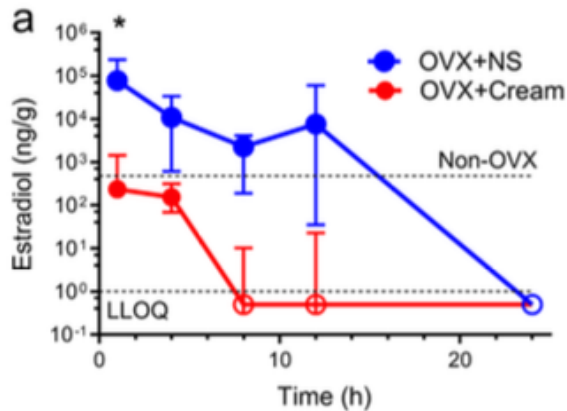


Zierden, et al. *Trends Mol Med.* 2021

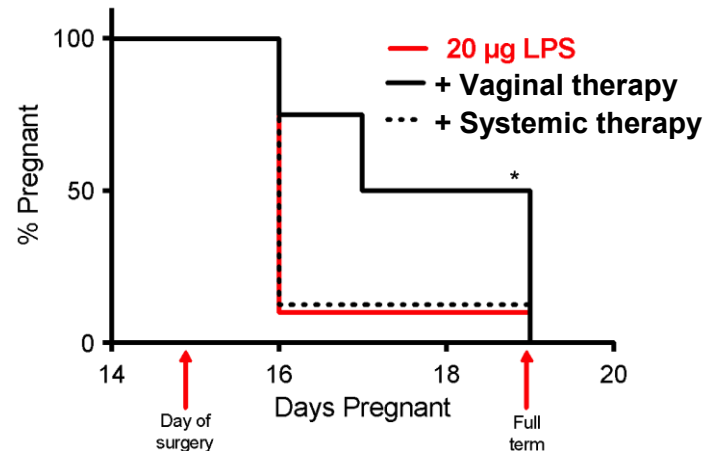
Rationally engineered nanoparticles enhance therapeutic potential of vaginal drug delivery



Hoang, Zierden, et al. *JCR*. 2019

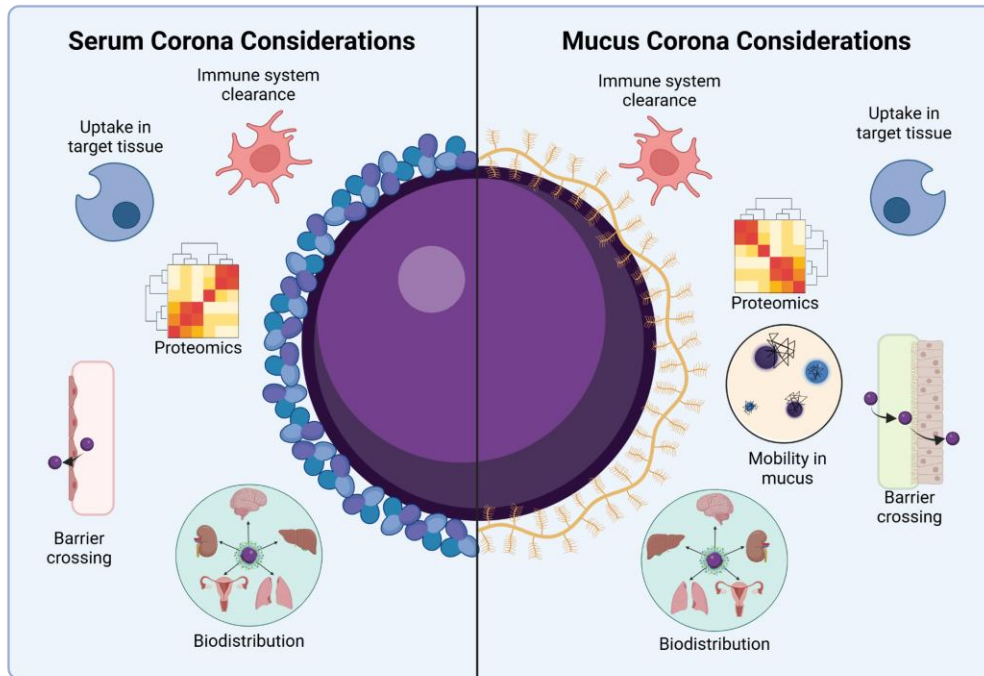


Shapiro, et al. 2024 *DDTR*



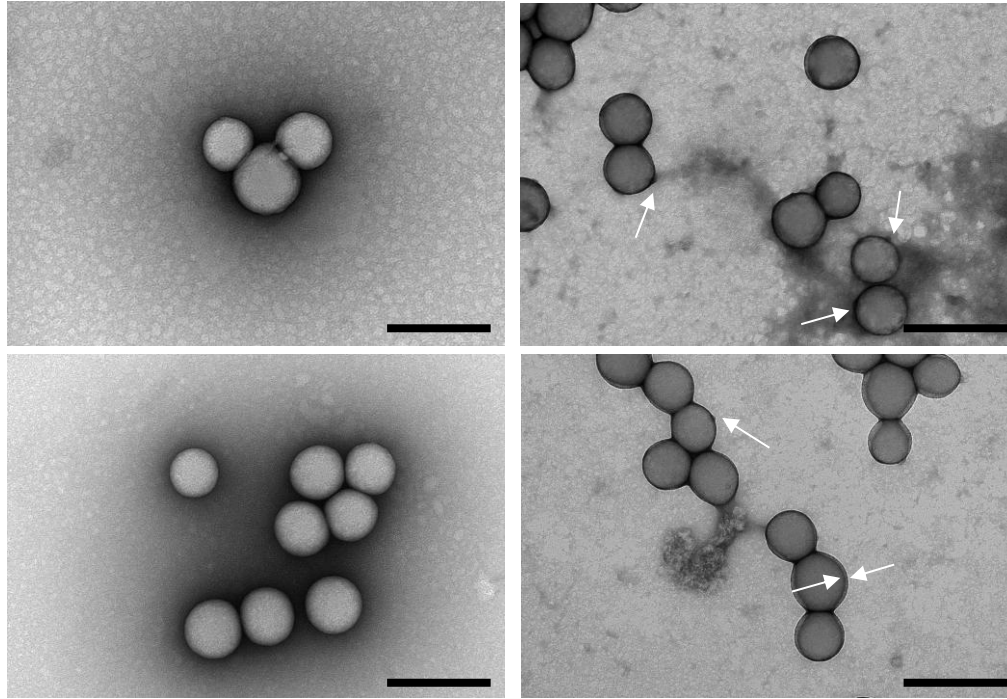
Zierden, et al. *Sci Trans Med*. 2021

Protein corona alters nanoparticle behavior



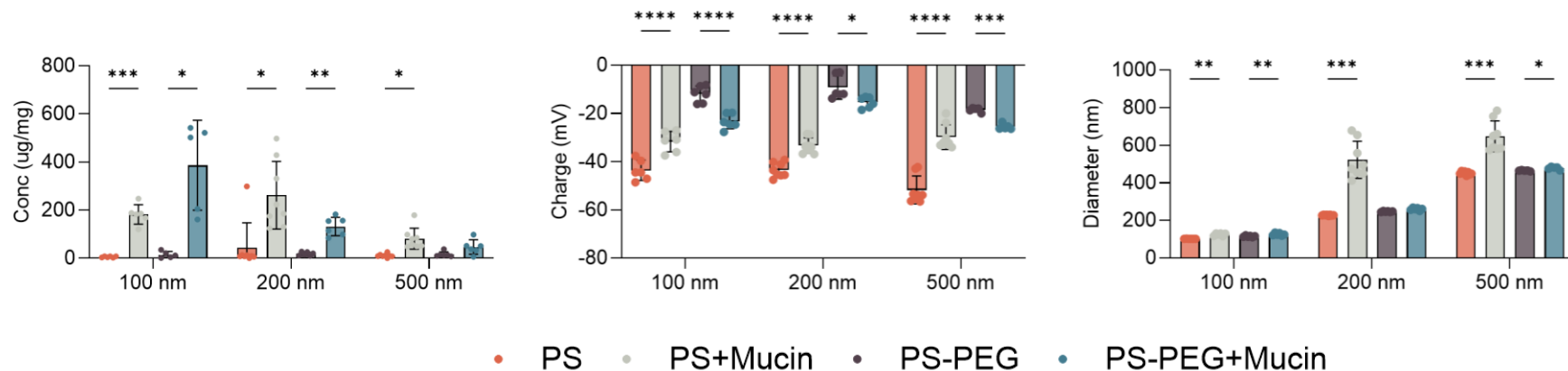
Stern, Petersen, et al. *Cell Press*. 2025

Mucin corona confirmed by TEM



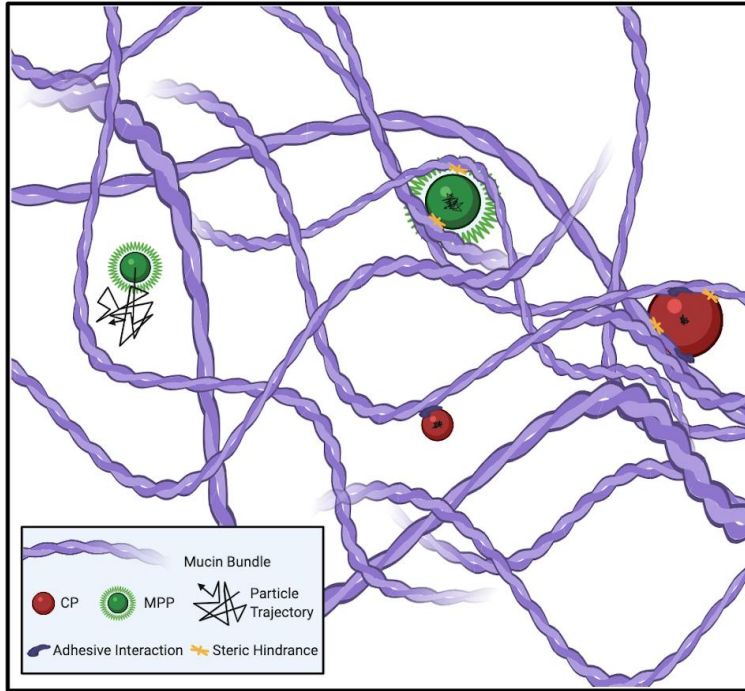
Unpublished Data

Nanoparticle size and charge significantly changed by mucin corona

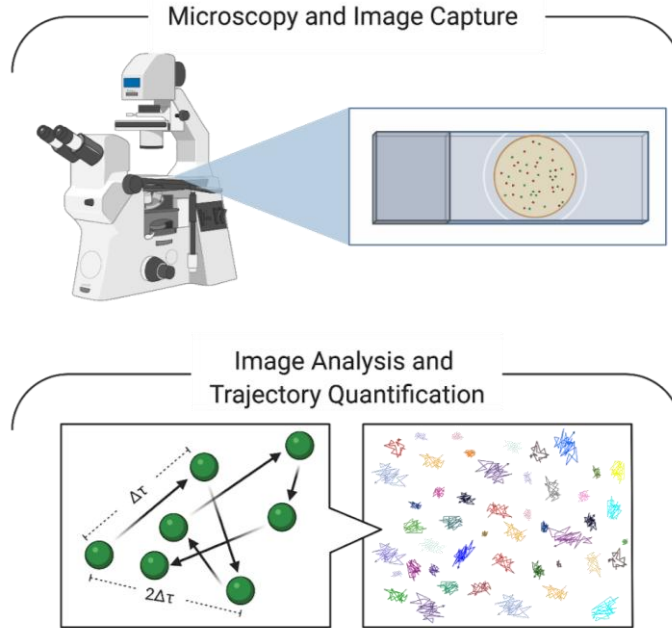


Unpublished Data

Multiple-particle tracking probes particle mobility



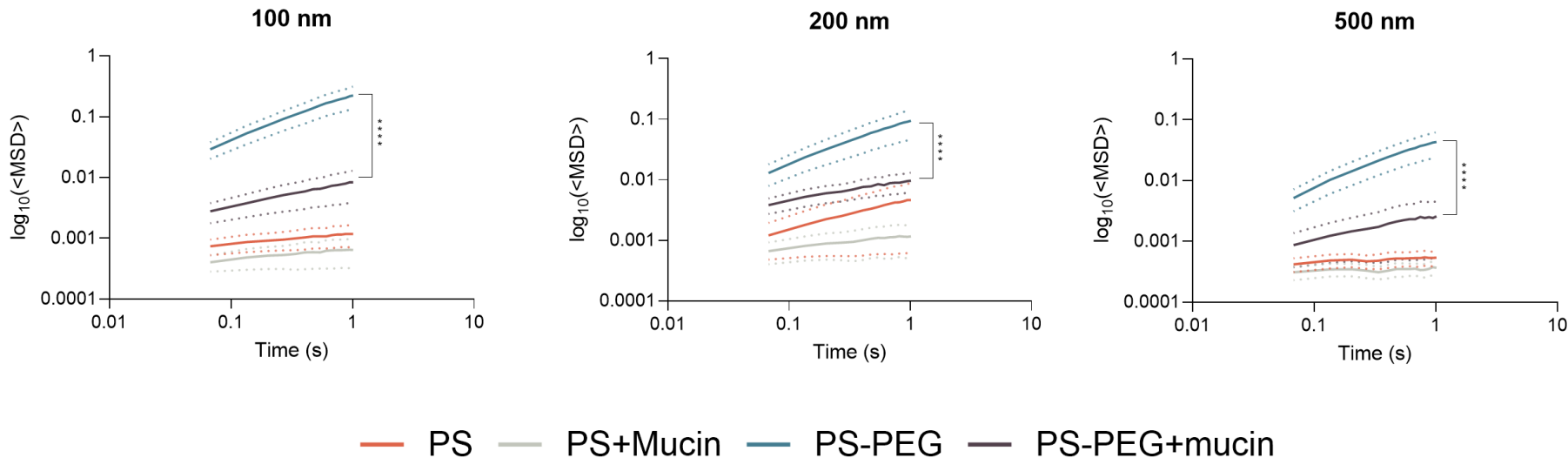
Zierden, et al. *Trends Mol Med.* 2021



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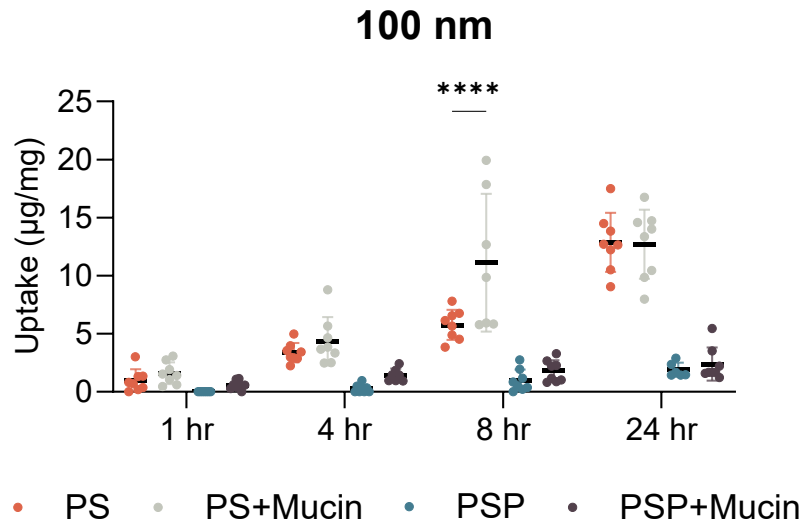
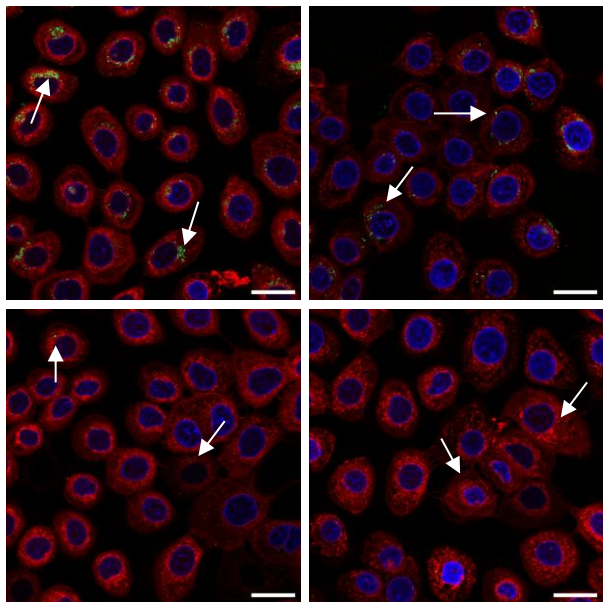
$$\text{MSD} = \langle \Delta r^2(\tau) \rangle = \langle (x_i - x_0)^2 + (y_i - y_0)^2 \rangle$$

Mucin corona reduces particle mobility



Unpublished Data

Particles with and without mucin corona are internalized by vaginal epithelial cells

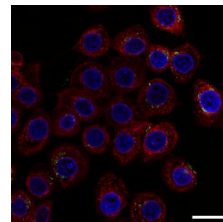
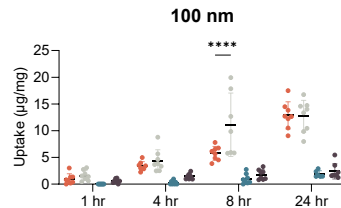
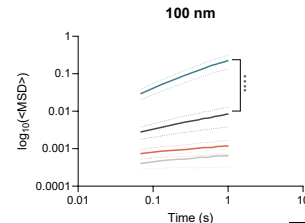
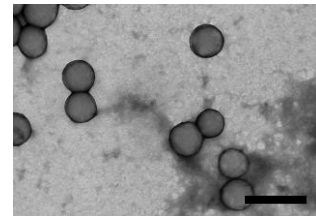
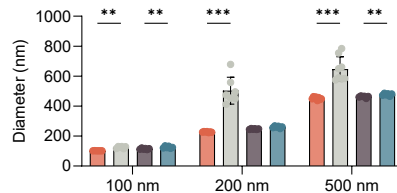


Unpublished Data

The mucin corona has a significant impact on drug delivery in the female reproductive tract



- Mucins form a measurable corona on nanoparticles
- Mobility of PEGylated particles reduced in *ex vivo* CVM
- Uptake in epithelial cells is altered by the mucin protein corona



Unpublished Data



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