

Physical interpretation of the size and concentration of extracellular vesicles measured by advanced techniques

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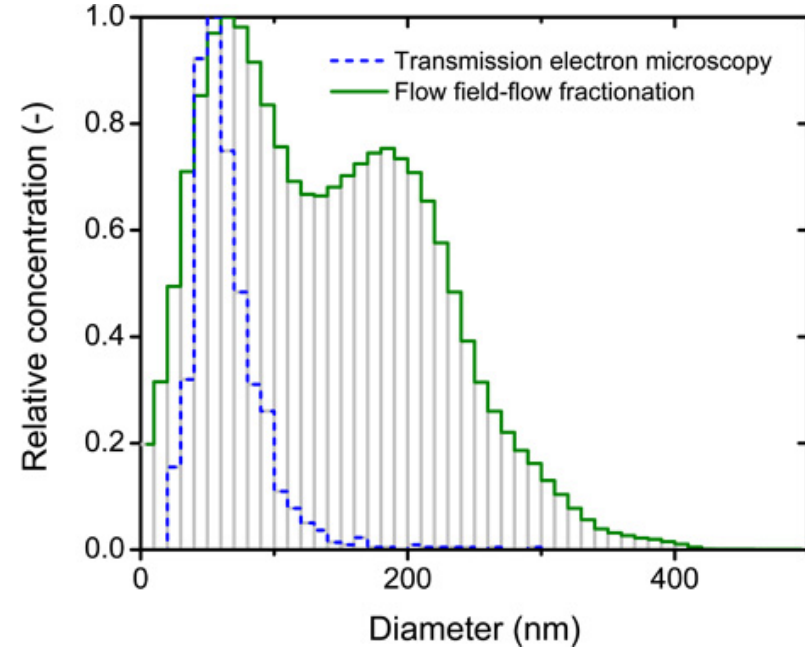
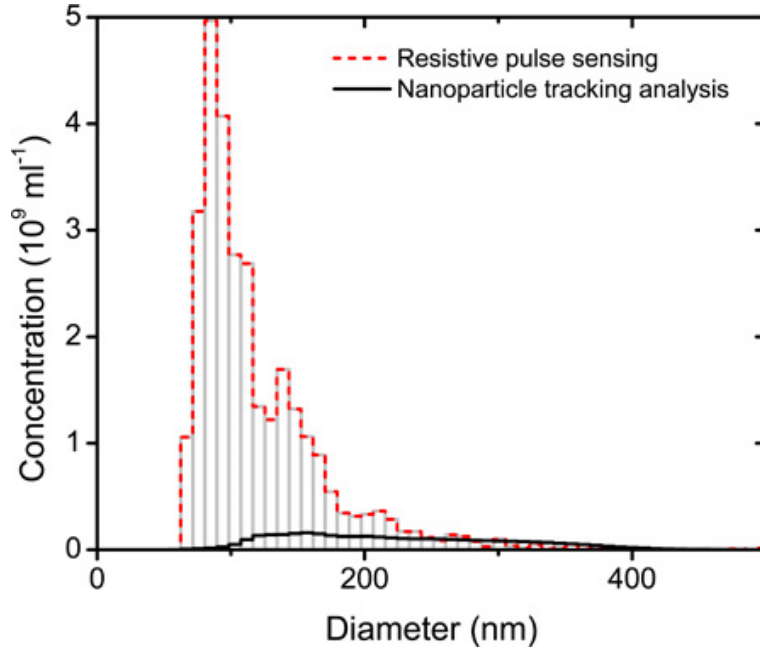
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Disclosures of: Edwin van der Pol

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Scientific advisory board	No conflict of interest to disclose
Consultancy	No conflict of interest to disclose
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Other	No conflict of interest to disclose

Presentation includes discussion of the following off-label use of a drug or medical device: N/A

Introduction



- vesicles measured by different techniques*
- each technique obtains a different size distribution

* van der Pol et al. P-MO-405 (ISTH 2011)

Goals

- enable data comparison between techniques
- obtain the size distribution of vesicles

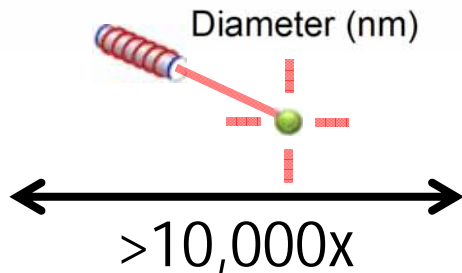
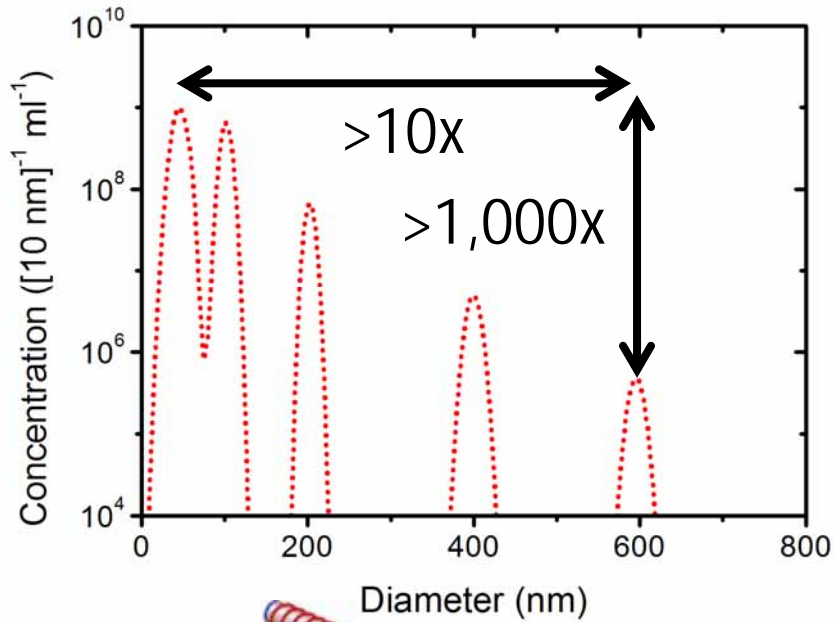
Methods



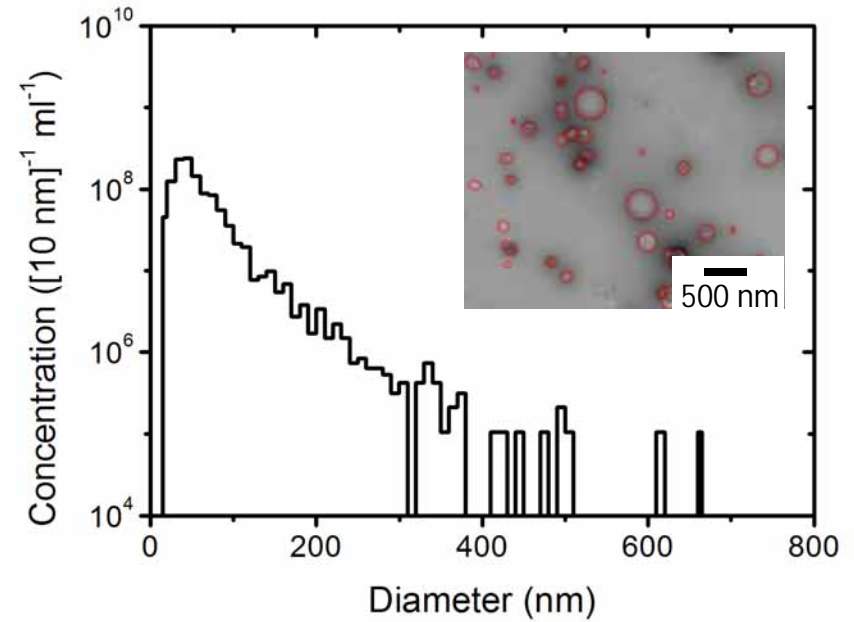
- standard population of
 - polystyrene beads
 - urine vesicles
- analyzed by
 - transmission electron microscopy
 - old flow cytometer (*FACSCalibur*)
 - new flow cytometer (*Apogee A50-Micro*)
 - nanoparticle tracking analysis (*Nanosight NS500*)
 - resistive pulse sensing (*Izon qNano*)

Transmission electron microscopy

reference beads



vesicle standard

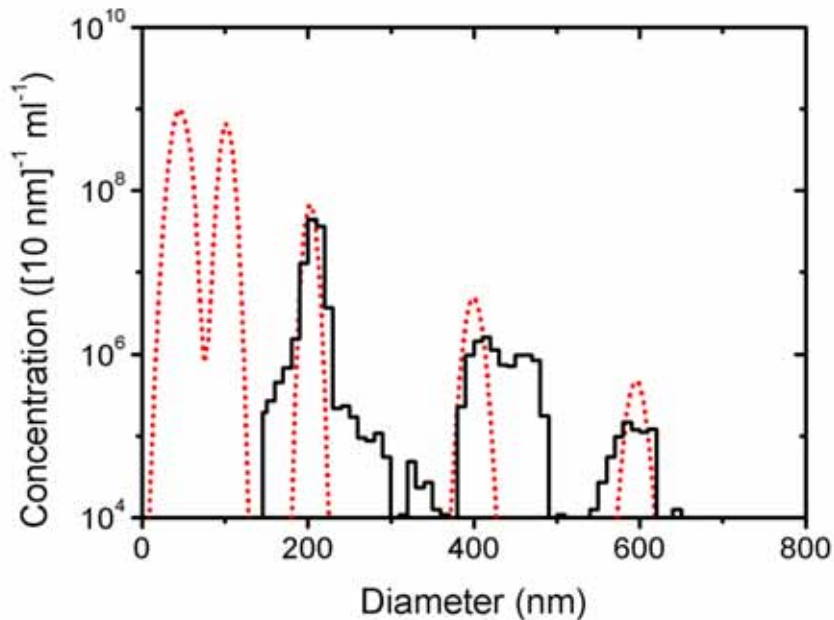


●
earth

●
moon

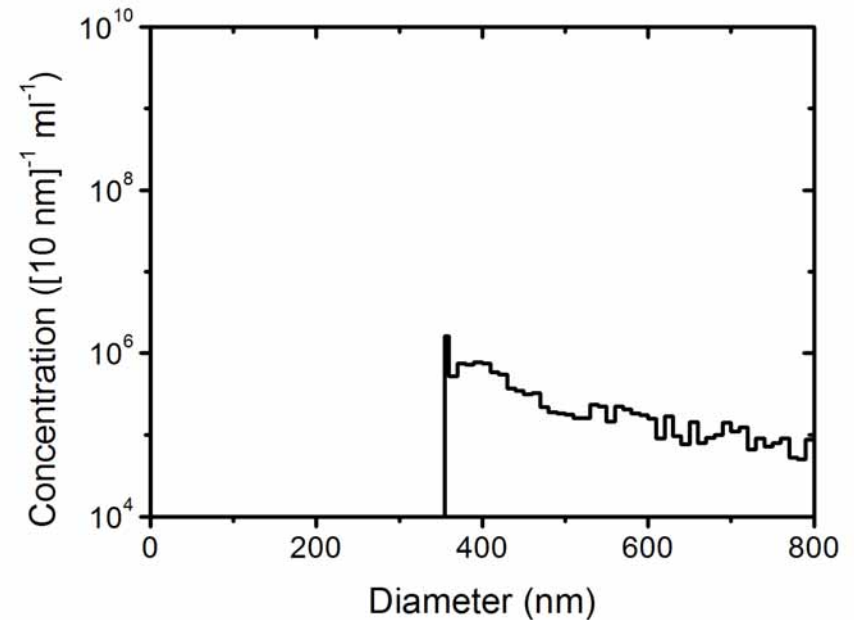
Conventional flow cytometry

reference beads



refractive index
polystyrene = 1.61

vesicle standard

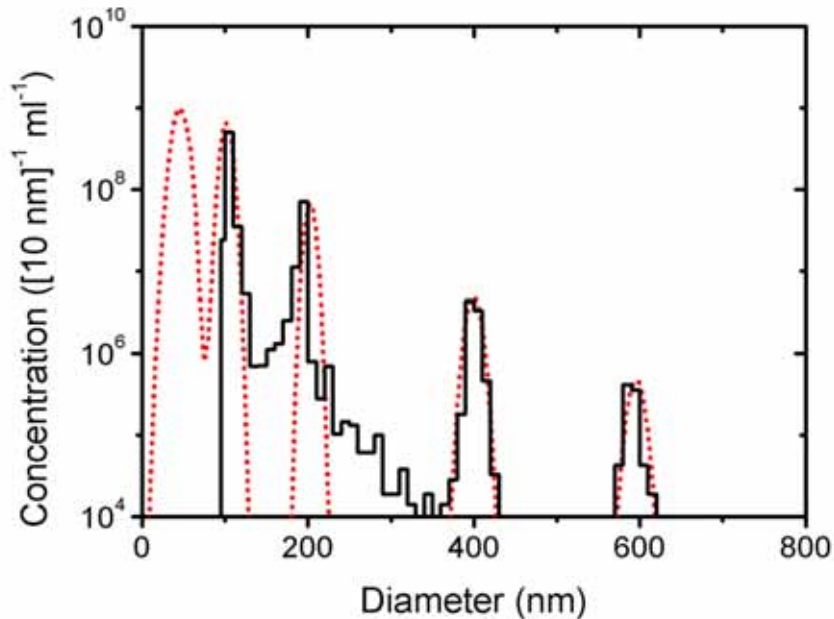


refractive index
vesicles* = 1.4

* van der Pol SC07-4.01 (ISTH 2013)

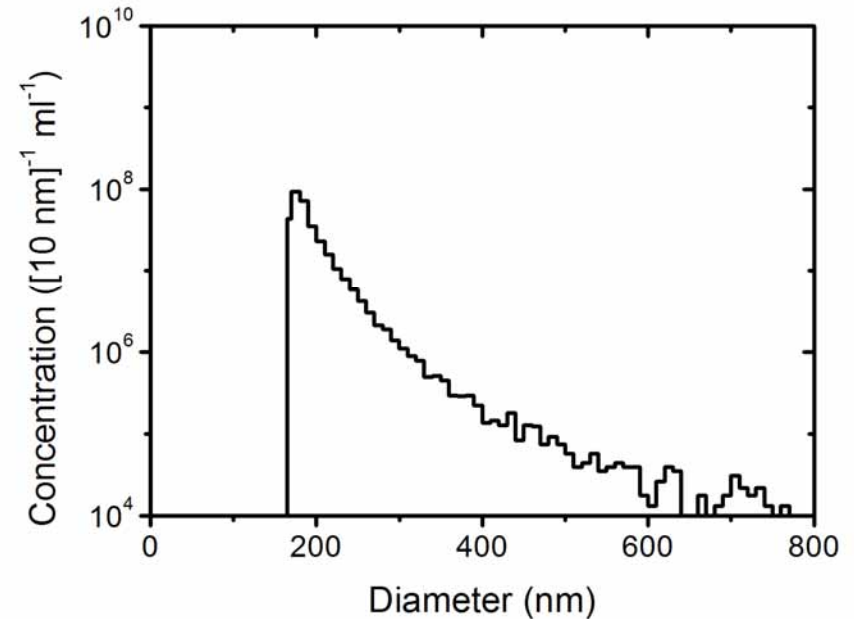
Novel flow cytometry

reference beads



refractive index
polystyrene = 1.61

vesicle standard

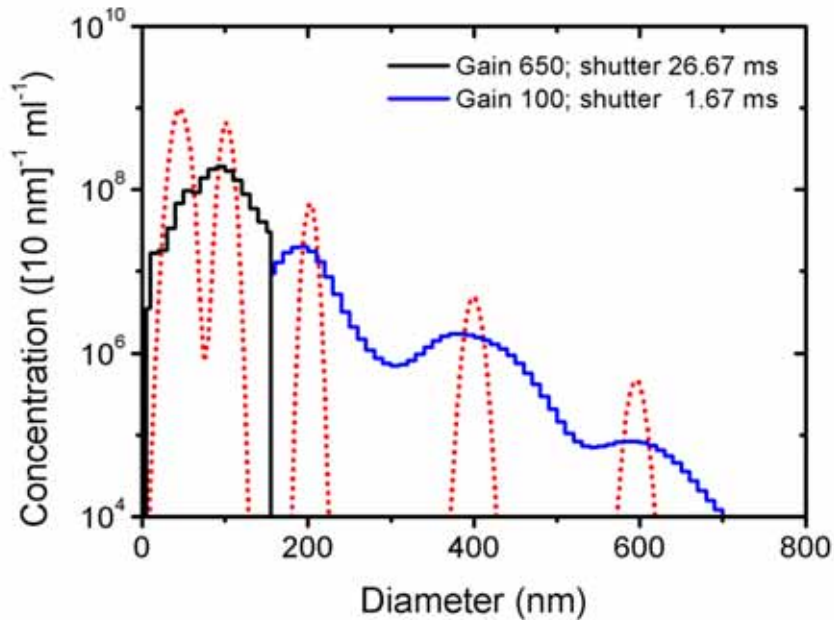


refractive index
vesicles* = 1.4

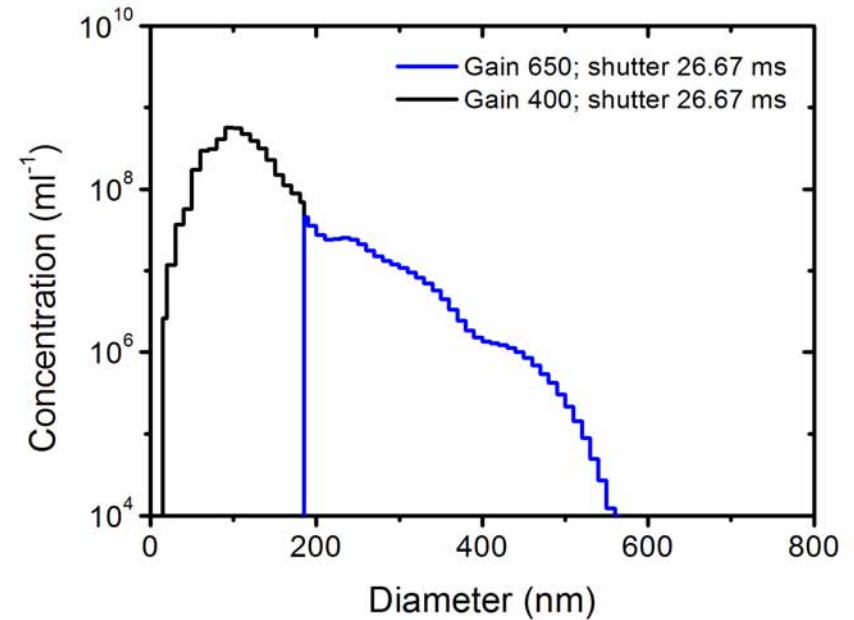
* van der Pol SC07-4.01 (ISTH 2013)

Nanoparticle tracking analysis

reference beads

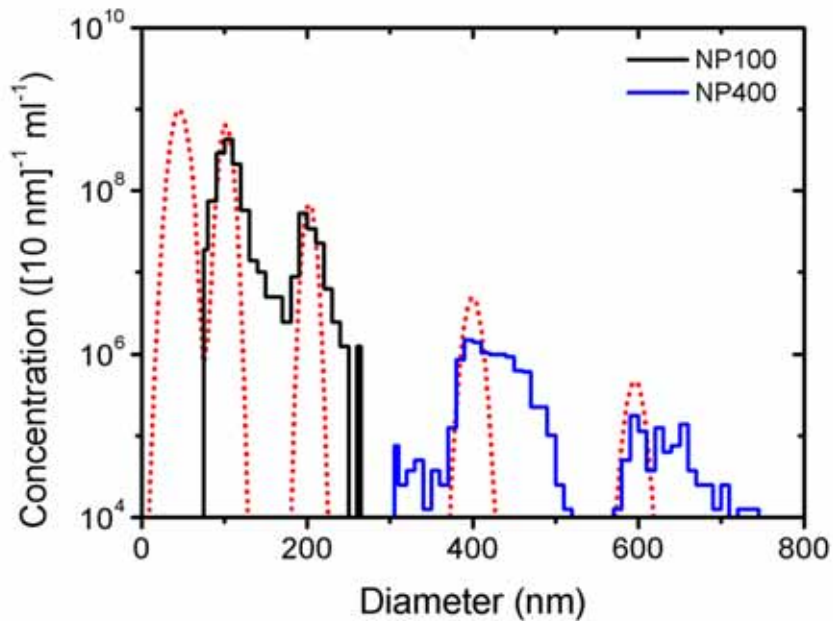


vesicle standard

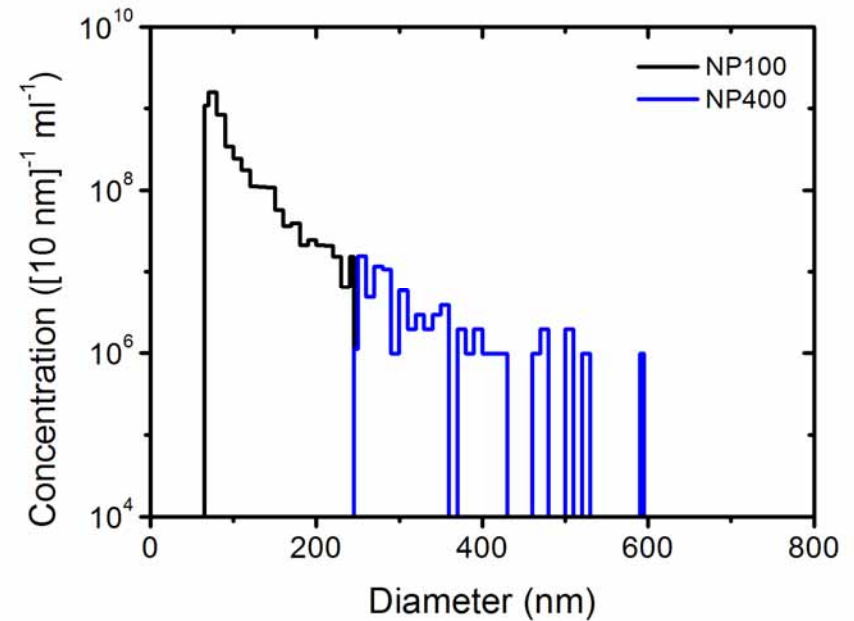


Resistive pulse sensing

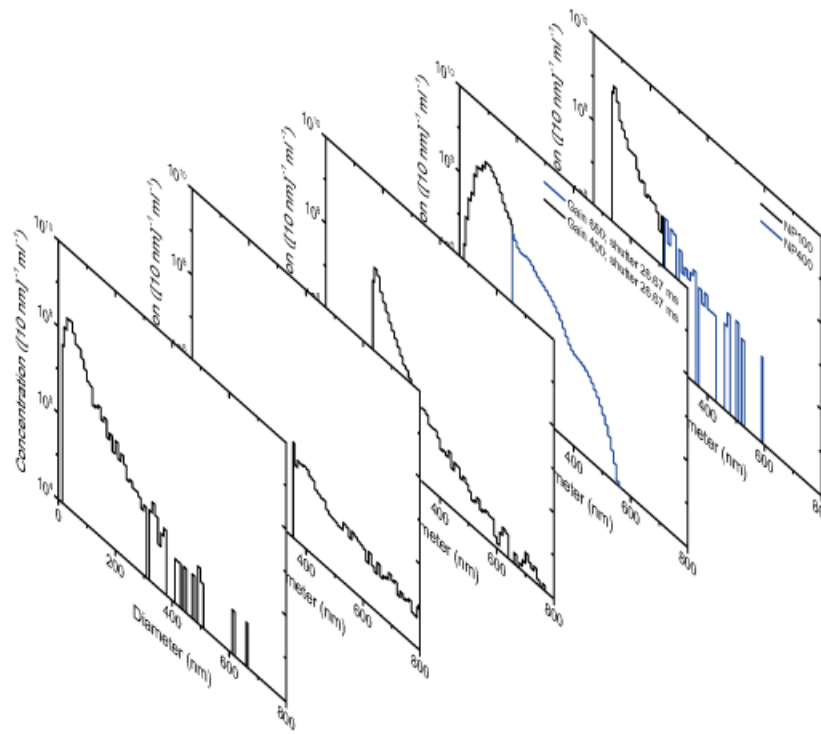
reference beads



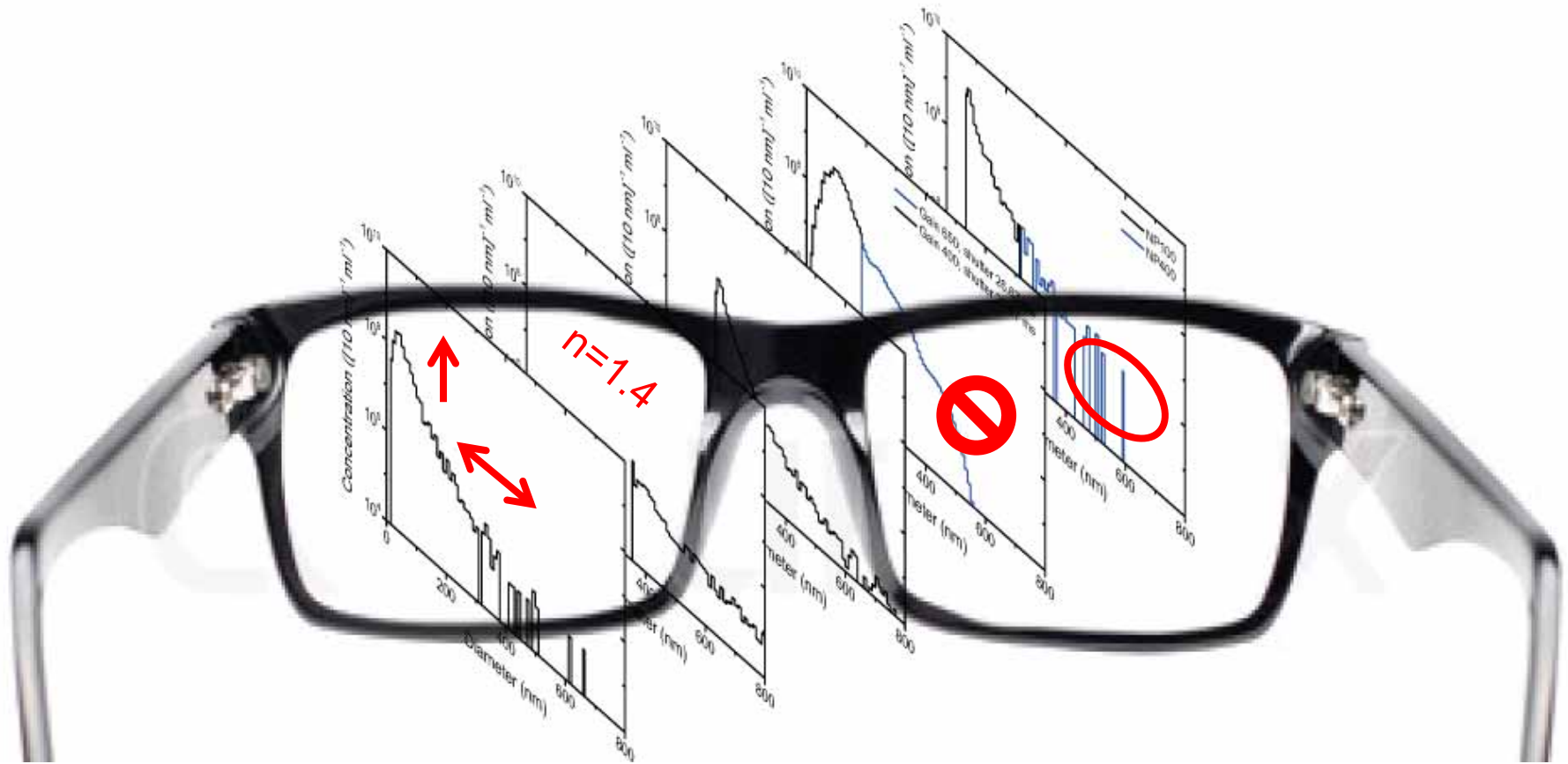
vesicle standard



Summary

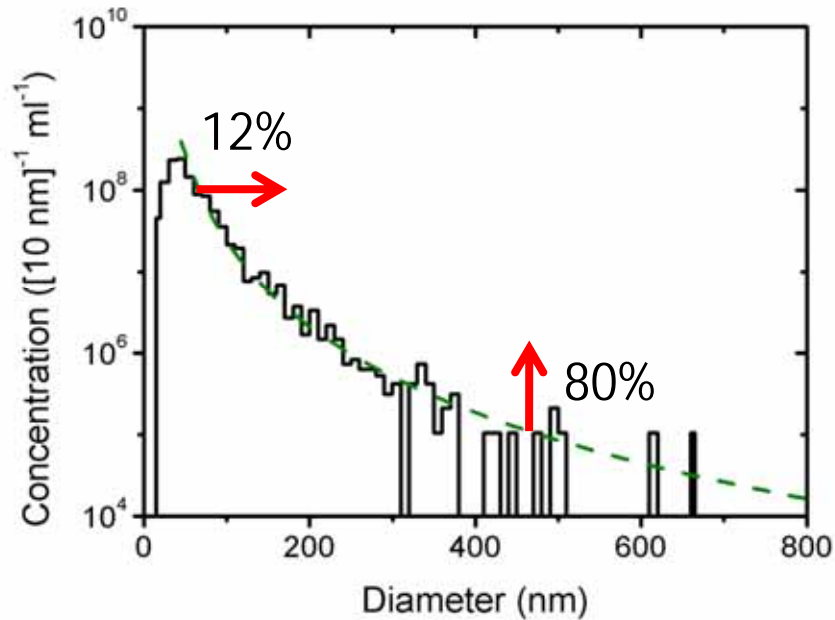


Summary

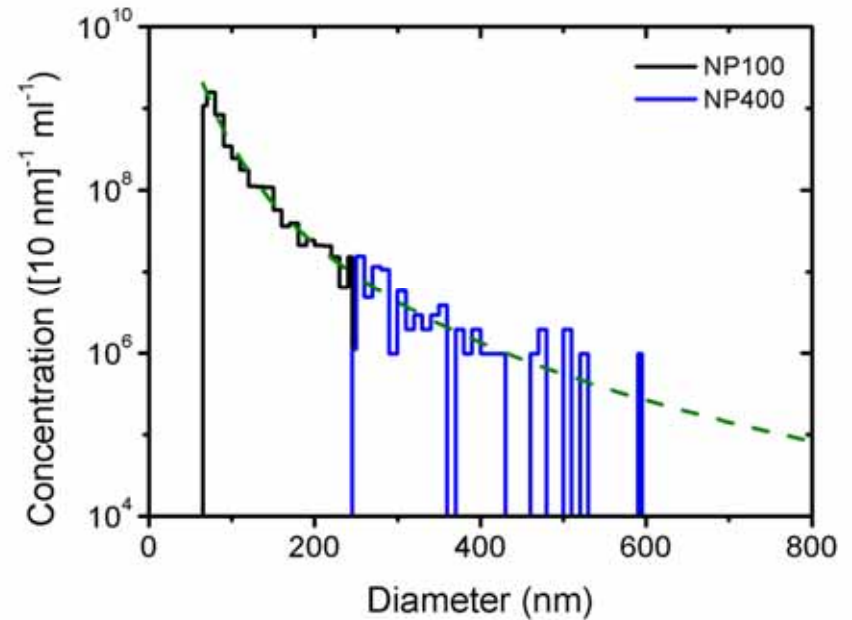


Outlook – data comparison

transmission electron microscopy

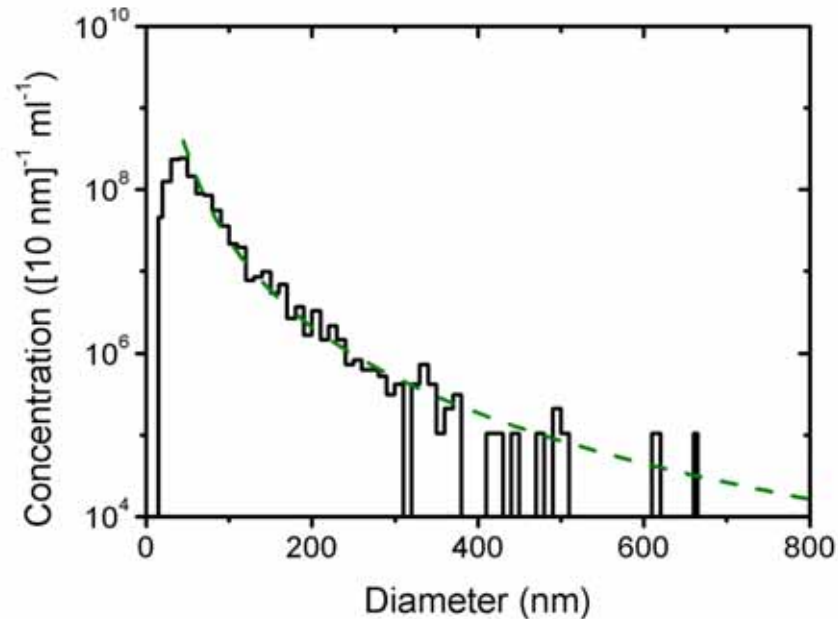


resistive pulse sensing



Outlook – fit parameters for clinical studies

transmission electron microscopy



power-law function:

$$C(d) = k \left(\frac{d}{d_0} \right)^{-m}$$

plankton



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More on microparticle detection:
edwinvanderpol.com

