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F-NTA: High Performance Quantification of Fluorescent Nanoparticles

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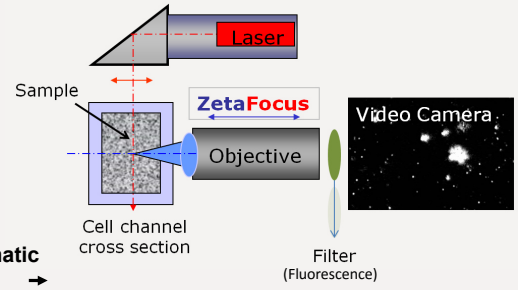
Introduction

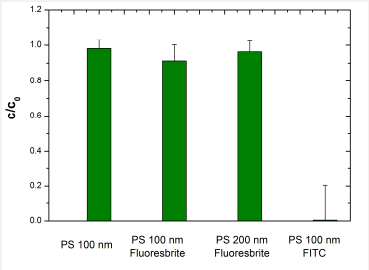
ZetaView NTA instrument

Fluorescent Nanoparticle Analysis (F-NTA) enables the user to gain bio-chemical information about particle surface.



F-NTA schematic

Effect of Bleaching

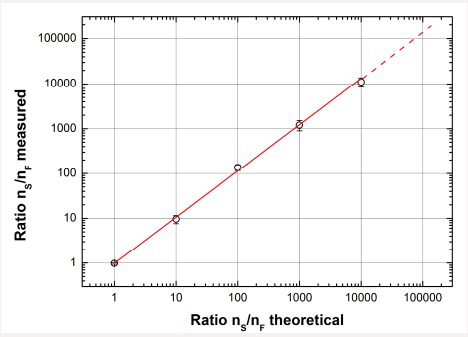


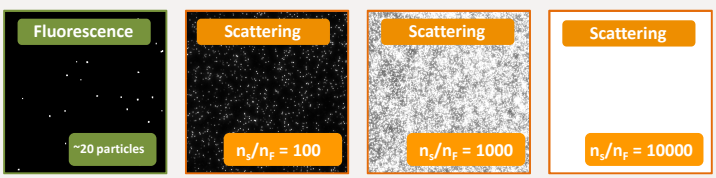
Concentration yield for λ_{Laser} = 488 nm after an exposure time τ > 30 min.

In general, bleaching (i.e. loss of analyte due to photochemical inactivation) correlates with **laser power and exposure time**. Stability was monitored for fluorescent labeled polystyrene particles and real samples.

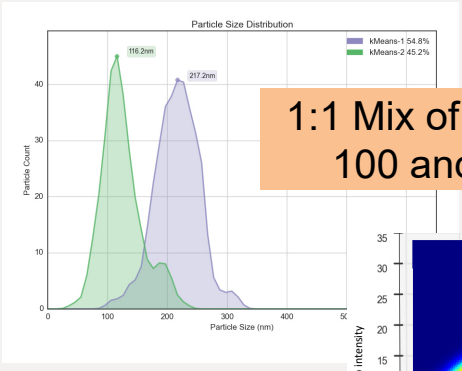
Dynamic Range

Detection of fluorescent polystyrene particles (100 nm) in the presence of unlabeled beads.

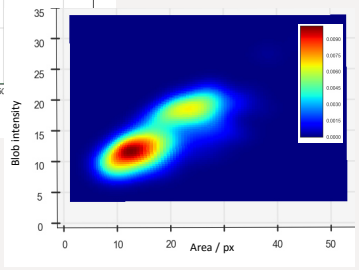




High resolution F-NTA



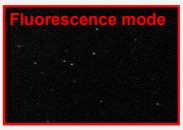
1:1 Mix of fluorescent 100 and 200 nm

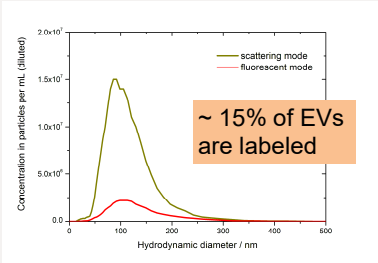


Resolution of mixture of 100 and 200 nm in fluorescent mode

Applications

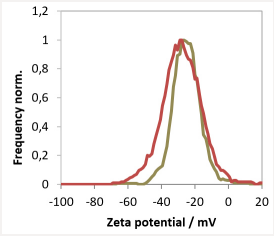
- Quantification of ACM derived EVs





~ 15% of EVs are labeled

- Zeta potential of tagged particles



Zeta potential distribution of tagged polystyrene particles 100 nm (red) and 200 nm (green)

Conclusion

- **Bleaching dominated by photostability of dye**
- **Detection of 1 fluorescent particle in 10000 unlabeled particles and better**
- **Resolution of 100 and 200 nm particles**