Responses to the Case Scenario

"Instrumentation, Metrology and Analytical Methods"

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The Task

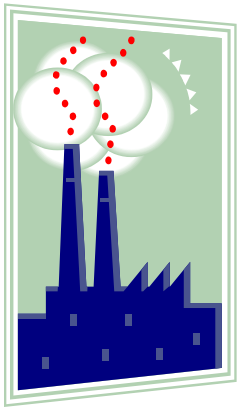
Reliable Measurement Data

Targeted Information

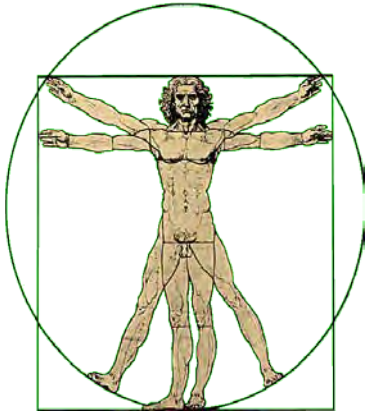
Sound Knowledge

Qualified Decision

Data evaluation



nanoparticles



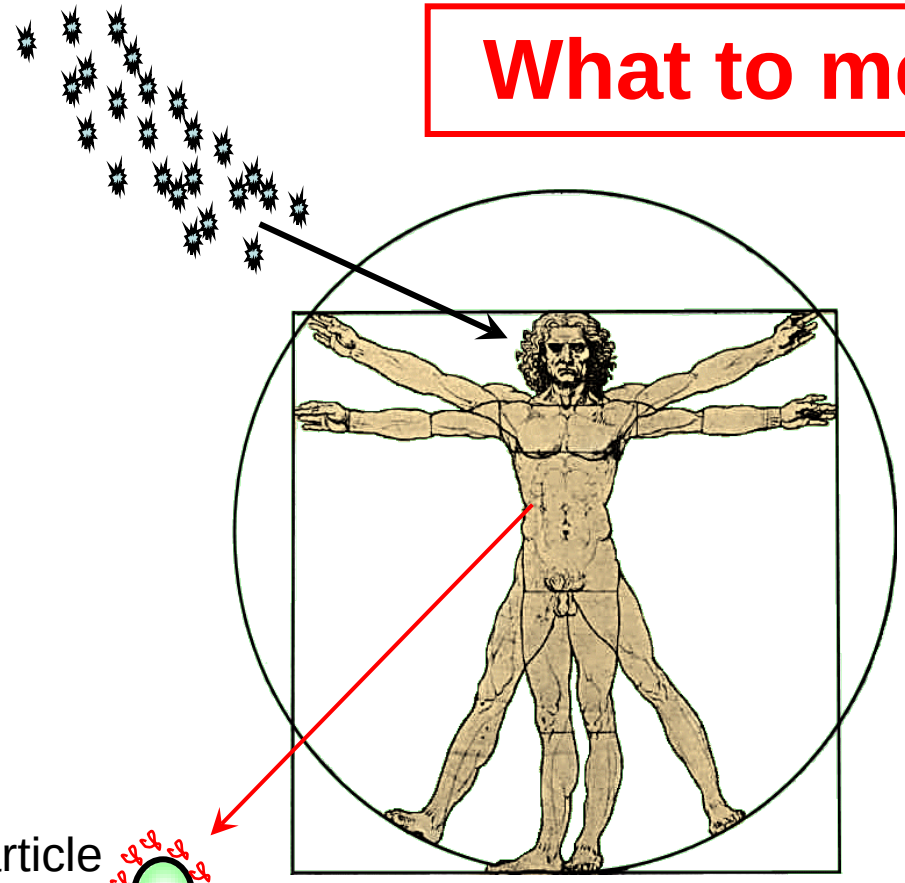
Measurement: Quantification of particles

Measurement: Identification of particles

(Sample Preparation)

Sampling

What to measure? Which unit?



nanoparticle suspension

- identifying & counting particles in air [😐☺☺]

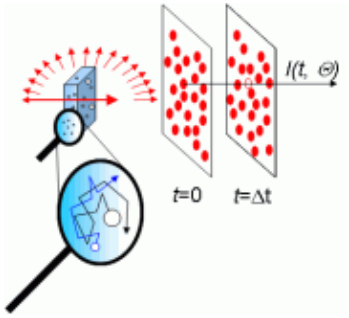
⇨ identifying & counting their 'metabolites' in biological matrices [☹😐☹]

⇨ measuring their functional properties [☹☹😐]

<u>but:</u> Particles unstable & reactive ↷ various transformations

⇨ measure dynamics

Dynamic Light Scattering



46 2 nm

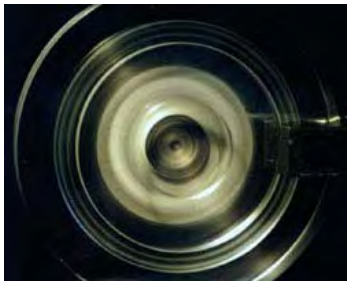
Hydrodynamic diameter

Nanoparticle size in suspension

EHS-(decision) relevant parameter?

Disc sedimentation

35 1 nm



Stokes diameter

Metrology concepts:

Definition of 'quantity to be measured'

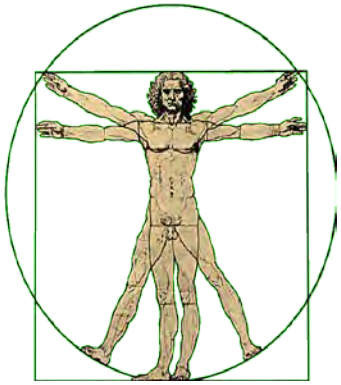
Establishment of metrological traceability of measured values (calibration, CRMs…)

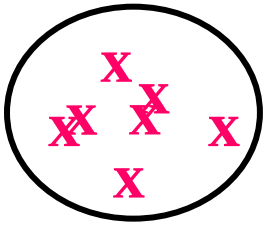
Estimation of measurement uncertainties

⇨ Prerequisites for data comparability & reliability

Some Challenges

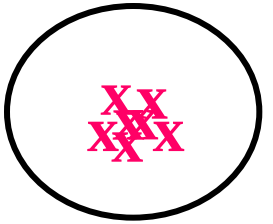
- **Identify sufficiently the crucial measur-ands** (most effects are not mass-related!)
- **Develop robust methods with adequate spatial and time resolution**
- **Avoid method-defined parameters**
- **Validate analytical methods** (avoid standardization)
- **Develop QA/QC tools** (reference materials, proficiency testing schemes…)





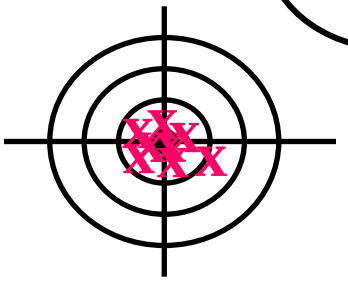
Comparability

♦ **in time** ♦ **between labs**



Reliability

(accuracy)



Thank you !