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# JOINT FORCES OF HR-SP-ICP-MS AND EAF4-MALS FOR CHARACTERIZATION OF GOLD NANORODS CONJUGATED WITH SYNTHETIC GLYCOPOLYMERS

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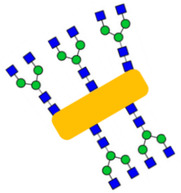
GHENT UNIVERSITY

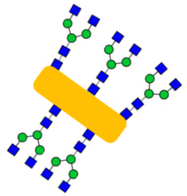
NanoCarb

fwo 12ZD120N

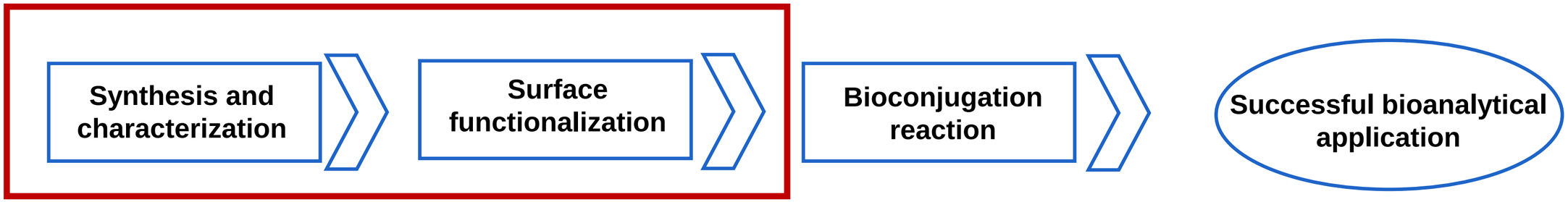
# Challenge: development of conjugated NPs



**Glycan-conjugated gold nanorods** (GNRs) to specifically bind and detect human lectins in stroke diagnosis due to the its improved surface plasmon resonance.

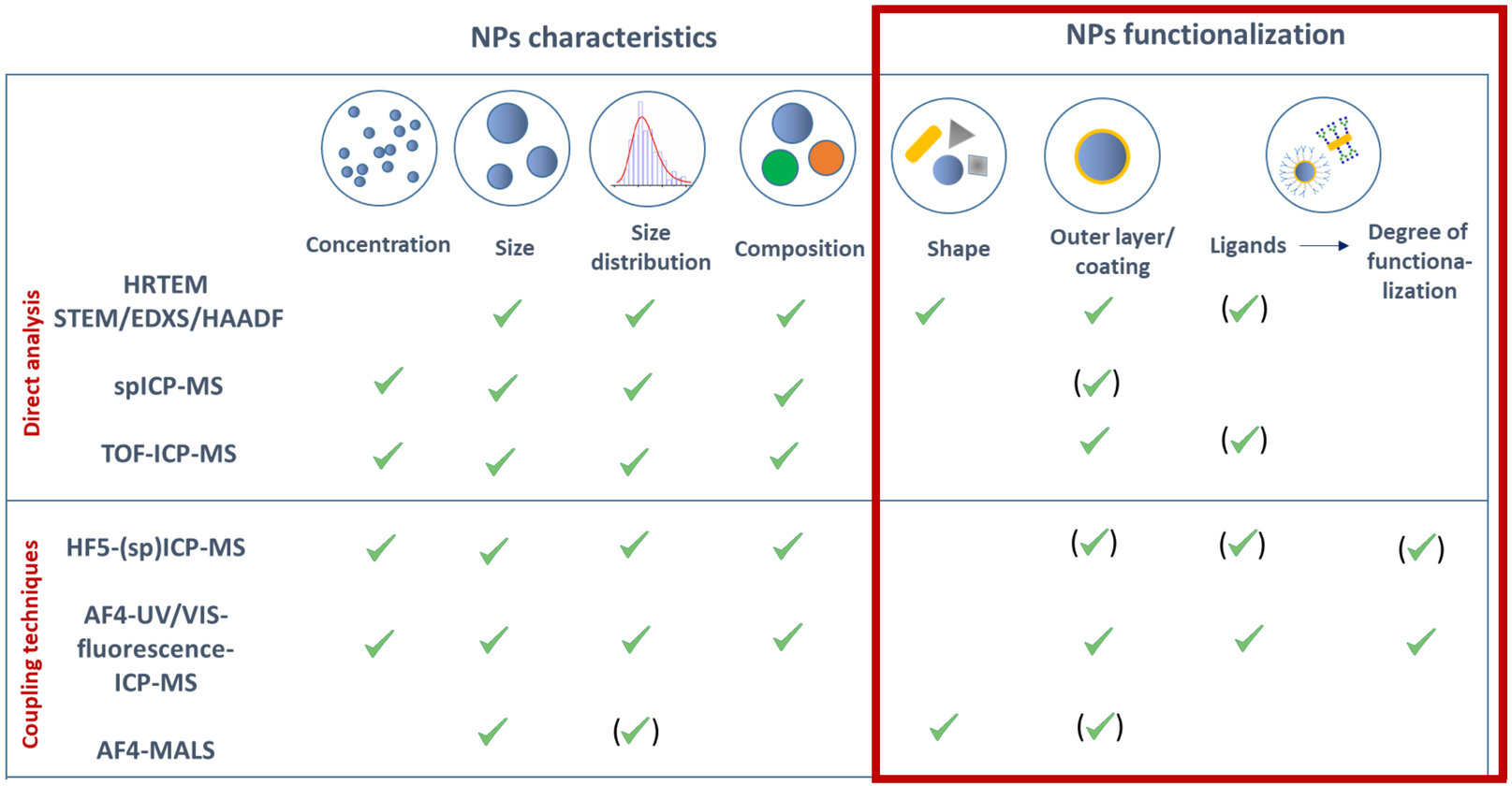


**Control of the development process**



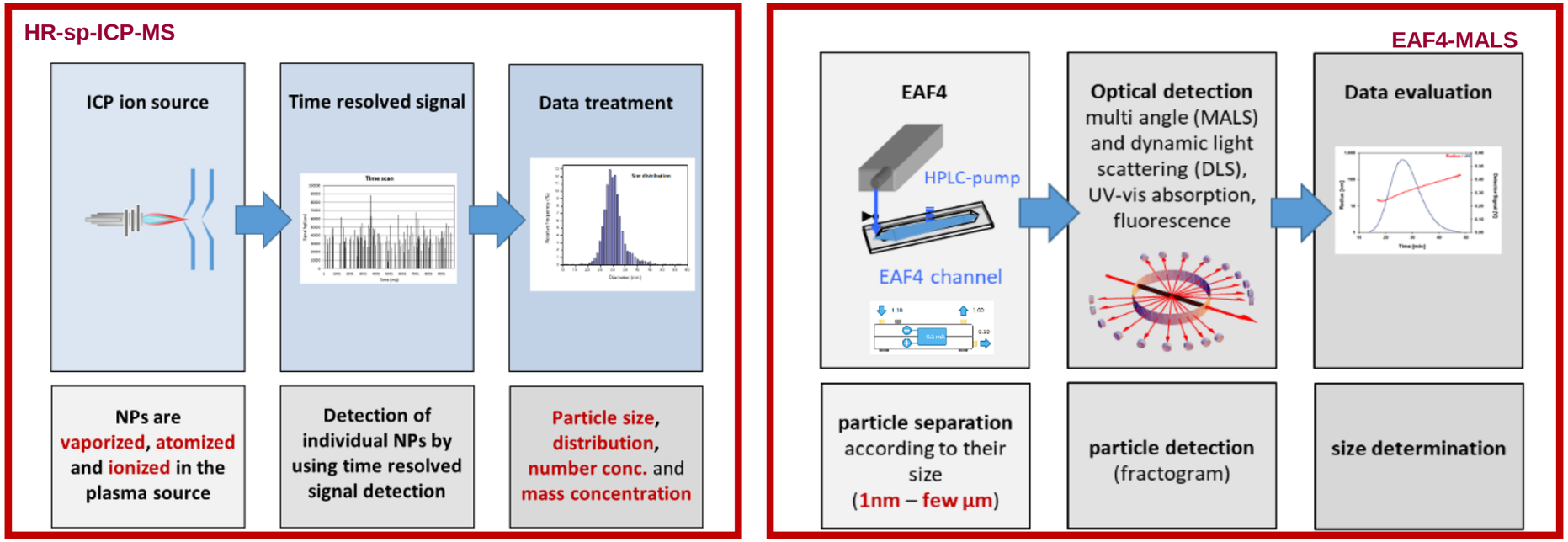

**Need for advanced analytical tools**

# Bringing characterization to the next level



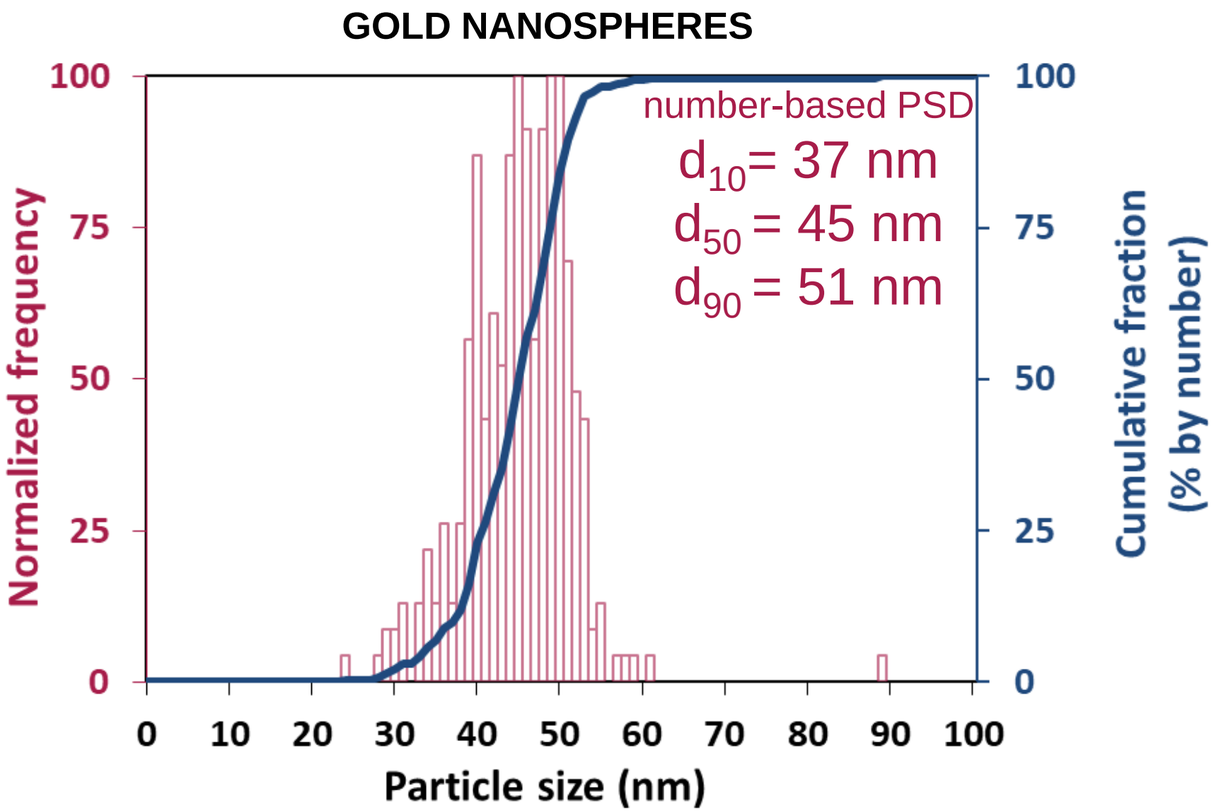

## Complementary analytical toolkit

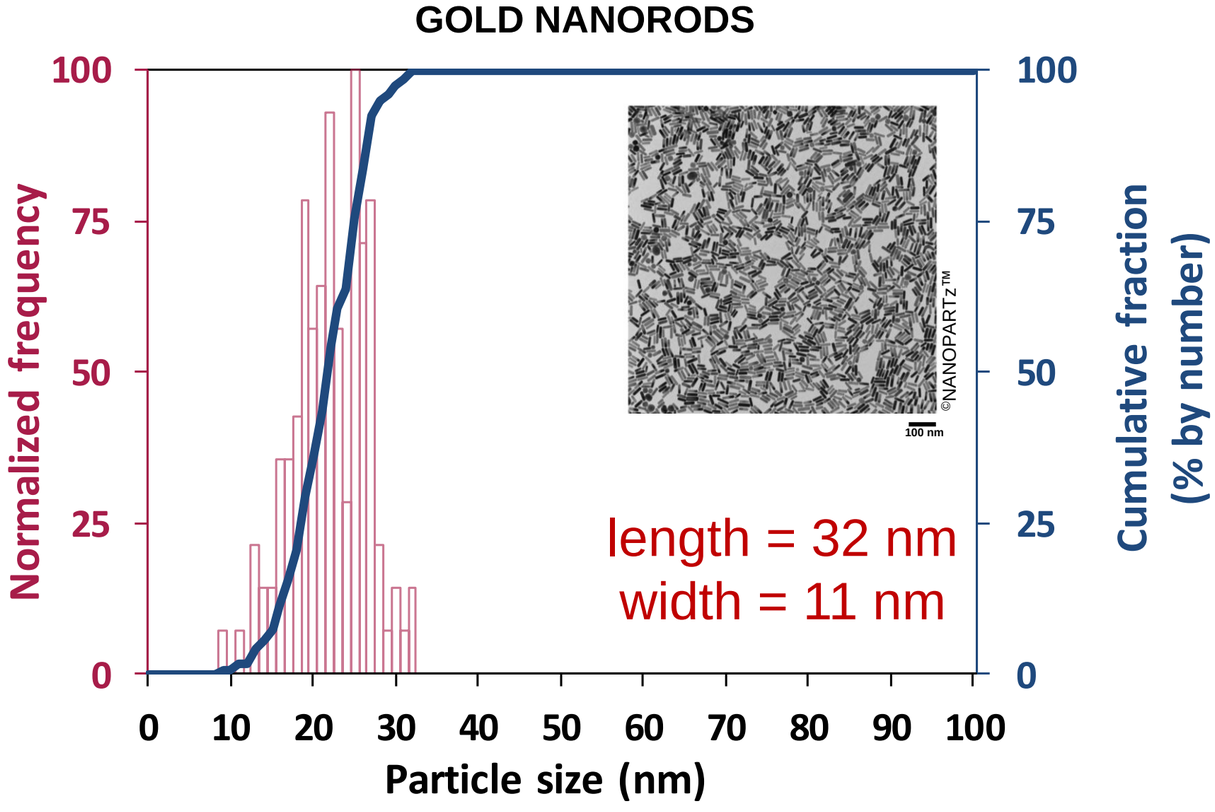
# Complementary analytical toolkit




## HR-sp-ICP-MS & EAF4-MALS

# HR-sp-ICP-MS - synthesis and characterization

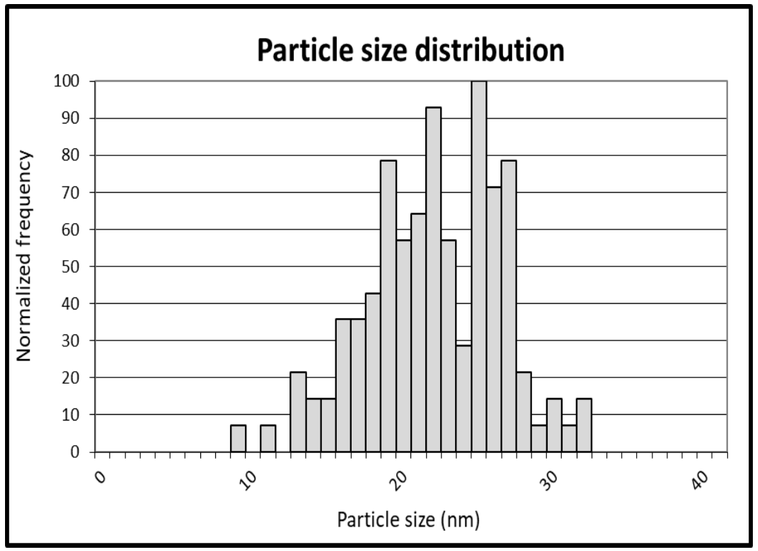



**Fast dimensional characterization of GNRs.**

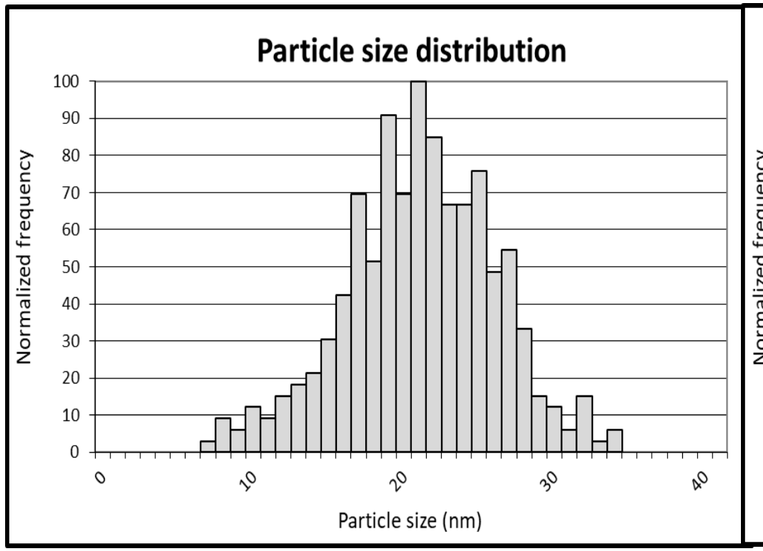
# HR-sp-ICP-MS – surface functionalization

**GNRs**



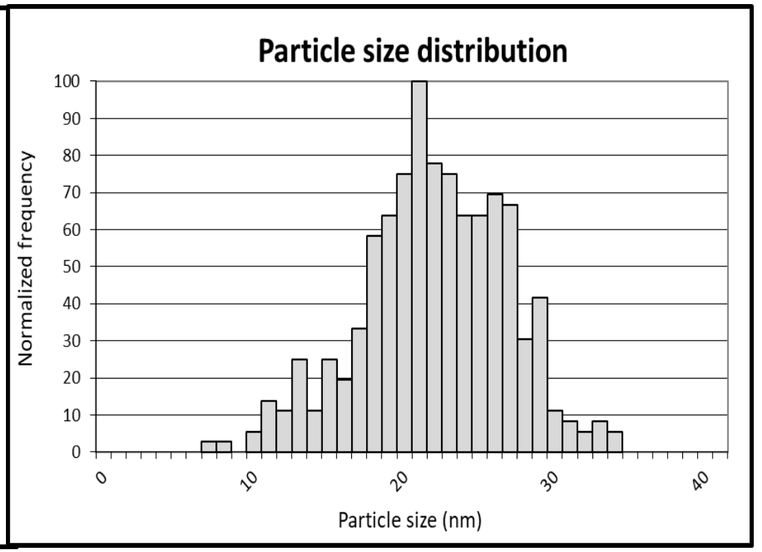

**21±0.5 nm**

**GNRs-Gal-PHEA30**




**21±0.4 nm**

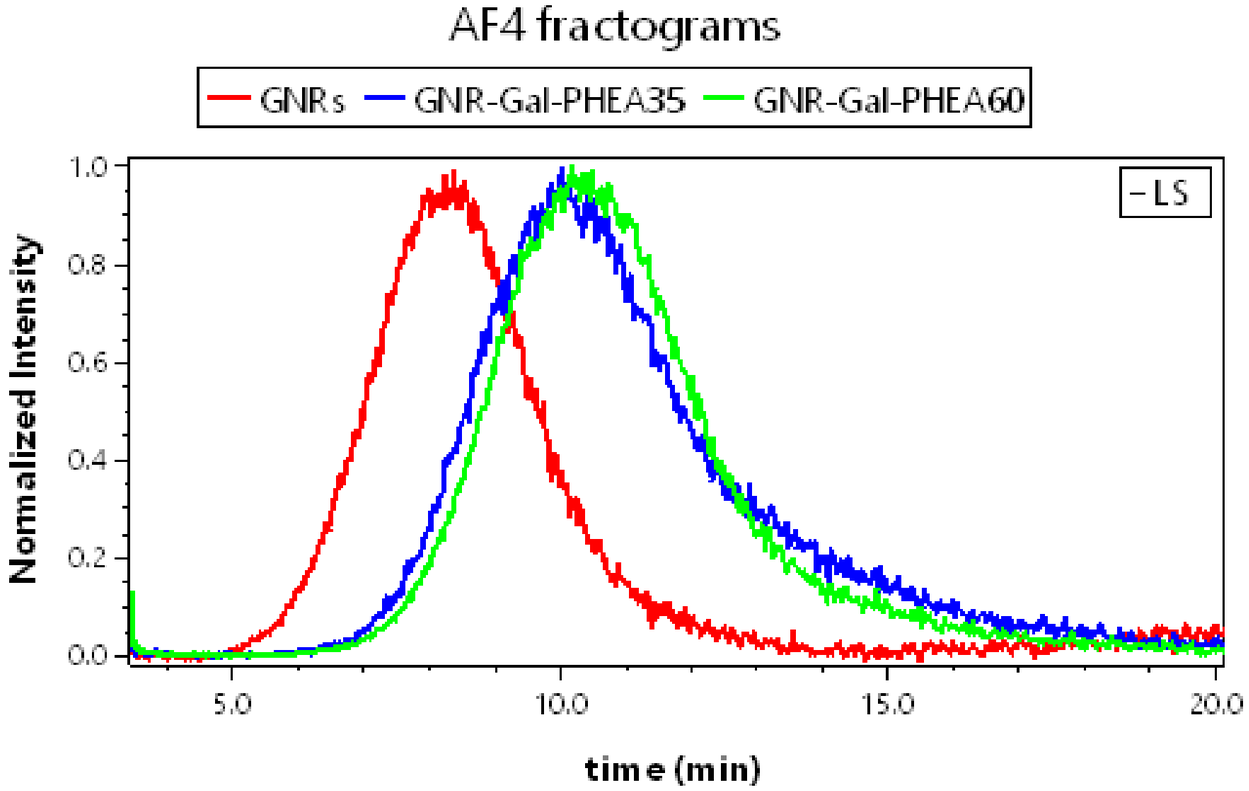
**GNRs-Gal-PHEA60**




**22±0.0 nm**

**Measuring coating thickness is not possible.**

# EAF4-MALS - surface functionalization




**Hydrodynamic diameter:**

| | |
|---|---|
| GNRs | **17.0** nm |
| GNR-Gal-PHEA35 | **21.3** nm |
| GNR-Gal-PHEA60 | **22.1** nm |

The hydrodynamic diameter obtained for GNR-citrate and GNR-Gal-PEG samples is in good agreement with the batch DLS data.

**Measuring coating thickness is possible.**

# CONCLUSIONS

- GNRs were separated and characterized via EAF4-MALS regarding their size and charge.
- HR-spICP-MS provided information on the GNRs particle number density, size, size distribution, and the dimensional characterization.
- EAF4-MALS appears to be suitable for estimating coating thickness of glycoconjugated GNRs.
- Significant advantage offered by joint forces of HR-spICP-MS and EAF4-MALS for characterization of glycoconjugated GNRs when compared to more common characterization methods.

**Further research is needed to assess significance and reproducibility.**

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