Peptide Coated Gold Nanoparticles for Bioimaging Applications

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Biocompatible peptide coated nanoparticles

Long-term high stability

We design short peptides suitable to form **highly dense self-assembled monolayers** on metal nanoparticles surface, e.g., gold, silver, iron oxide. The peptide coatings enable for the passivation of nanoparticles and ensure a **long-term high stability in biological environments**.

No aspecific binding to live cells

The peptide coating **fully prevents aspecific binding of the nanoparticles to live cells membrane**. When appropriately functionalized, the peptide coated nanoparticles ensures true positive results during the tracking of specific cellular targets.

Targeting Agents for Live Cell Imaging

Monofunctional nanoparticles for imaging of single biological events

We develop strategies for the functionalization of peptide coated nanoparticles with biomarkers such as peptides, proteins, DNA. The targeting of single biological events is ensured by the **control of the stoichiometry of the conjugation of biomarkers** to peptide coated nanoparticles.

We recently achieved the **targeting of lipid microdomains on live cells** by stoichiometric functionalization of peptide coated gold nanoparticles with a sphingolipid-binding domain peptide, the SBD peptide.

References:


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Targeting agent for lipid microdomain tracking on live cells. Peptide coated gold nanoparticles (10 nm diameter) stoichiometrically functionalized with a peptide biomarker, the SBD peptide, enables for identification and study of the dynamics of lipid rafts on neuroblastoma cells by photothermal microscopy.

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Photothermal imaging of neuroblastoma cells incubated with peptide coated gold nanoparticles. **A)** Absence of non-functionalized gold nanoparticles after washings of the cells; **B)** Biofunctionalized peptide coated gold nanoparticles targeting specific cell membrane domains.

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Peptide coated gold nanoparticles of 10 nm diameter tested under harsh conditions shows high stability for days against ligand exchange and electrolyte-induced aggregation.