Summary:

An overall overview of nanomedicines was presented and illustrated with examples from Álvaro Somoza's research group using gold nanoparticles, gold nanoclusters, and magnetic nanoparticles.

Gold nanoparticles can be functionalized with oligonucleotides to yield Spherical Nucleic Acids, which can be used for sensing and drug delivery. In the presentation, the detection and treatment of Uveal Melanoma were achieved with this type of nanostructures.

Other interesting nanomaterials are gold nanoclusters, which have been stabilized with albumin and functionalized with two different drugs for the treatment of breast cancer.

The last nanostructures mentioned in the presentation were the magnetic nanoparticles developed in a European consortium ***MultiFun***, which are the starting point of another European Consortium ***NoCanther***. In this project, we aim to scale-up the process and carry out clinical studies of the magnetic nanoparticles for the treatment of pancreatic cancer.

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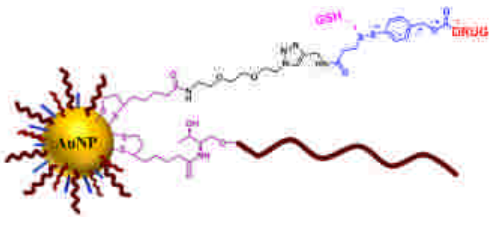
Applications of Nanotechnology against Cancer



Álvaro Somoza

18th January 2017

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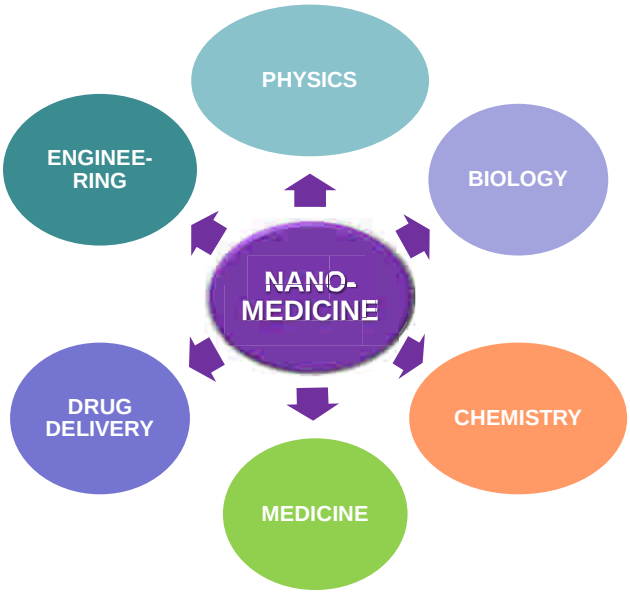
Nanomedicine

Nanotechnology for the study, detection and treatment of diseases



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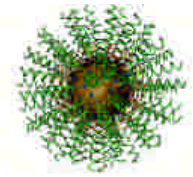
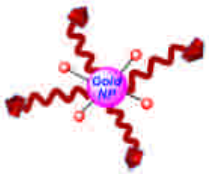
Nanomaterials

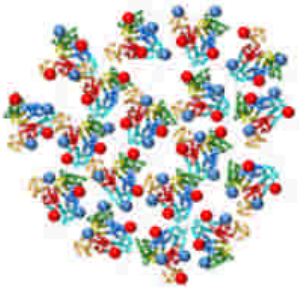
Spherical Nucleic Acids



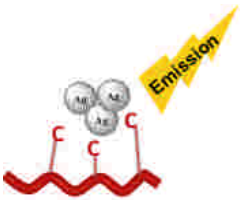
Gold Nanoparticles



Albumin Based Nanostructures



DNA-AgNCs



Magnetic Nanoparticles

Hydrophobic Molecular Beacon

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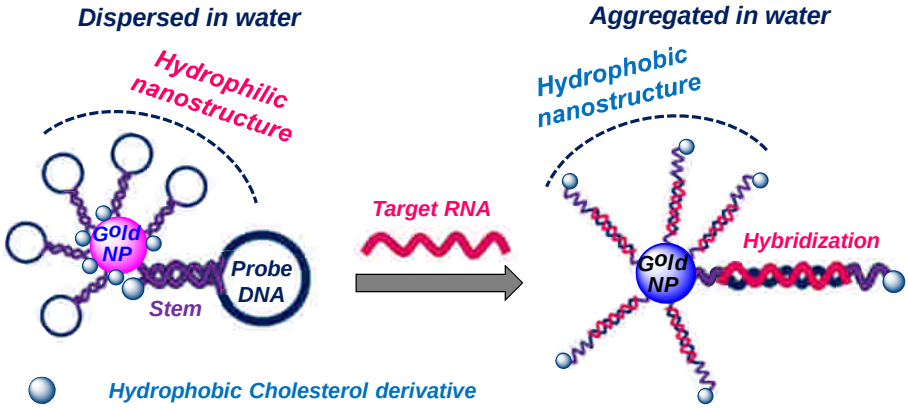

Chem. Commun. **2014**, *50* (23), 3018.

DNA Stabilized Gold Nanoparticles as DDS

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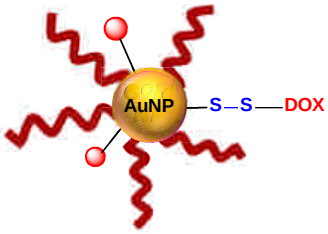
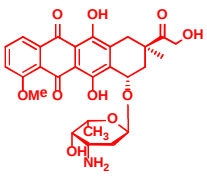
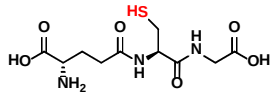
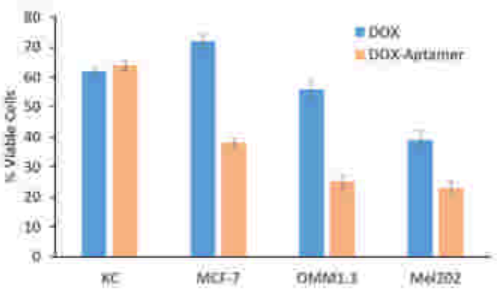


Selective Release inside the Cell

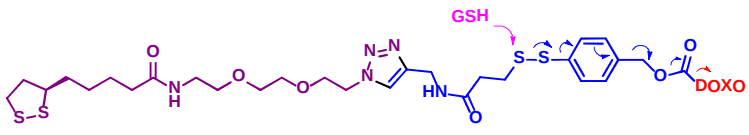




- GSH extracellular concentration ≈ 1 μM
- GSH intracellular concentration ≈ 1 mM



✓ ***Release the drug in its active structure:*** ***self immolative linker***

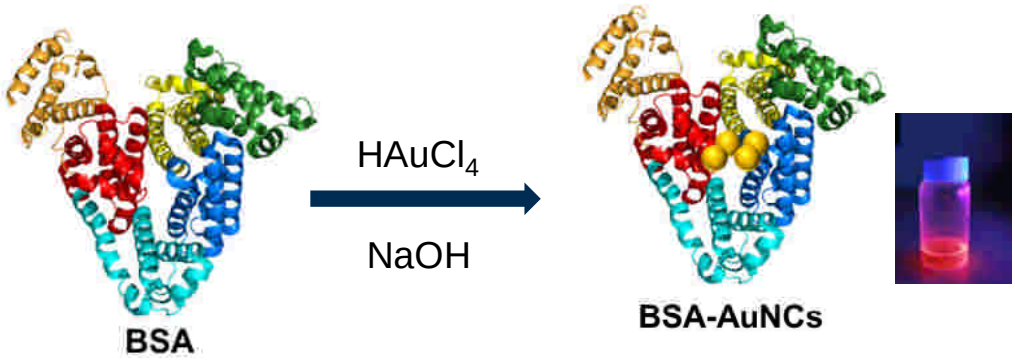


Left part:
Thiolane moiety has higher affinity by gold NP

Right part:
Self immolative ***and*** ***drug***

Nanoscale **2014**, *6*, 7436.

Albumin-Based Nanostructures



Koyakutty et al. *Nanotechnology* **2010**, *21* (5), 055103.

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