COSMETIC APPLICATIONS OF SILVER NANOPARTICLES

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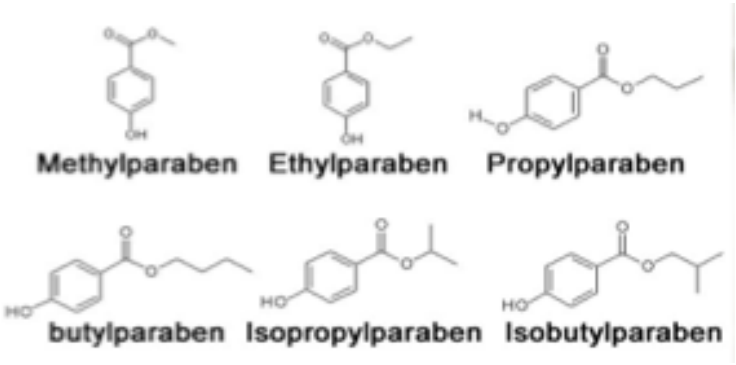
Parabens in cosmetic product

Preservatives are excipients added to prevent the unlimited the growth of microorganism.



Alkyl esters of *p*-hydroxybenzoic acid, well-known as **parabens**, are the most common molecules used as preservatives in cosmetic products.

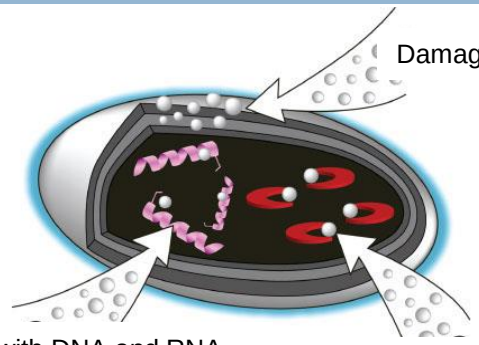
Their use is lately restricted for the potential toxicity.

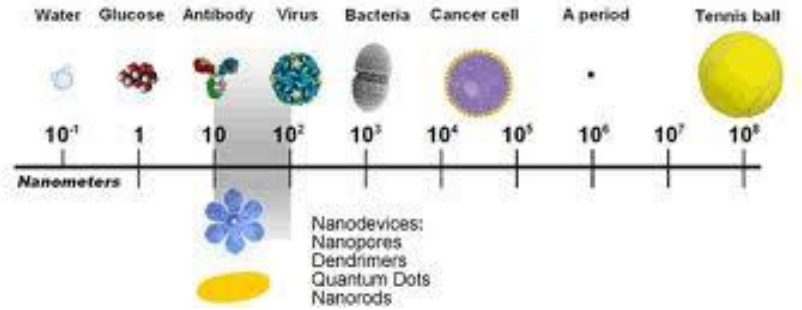
Potential relationship between increasing incidence of breast cancer and oestrogenic activity of parabens.

IS THERE AN ALTERNATIVE TO PARABENS?

Silver Nanoparticles

Silver, known in metallic form since antiquity, has been used in numerous fields to prevent microbial growth because it is a natural biocide, with broad spectrum activity.

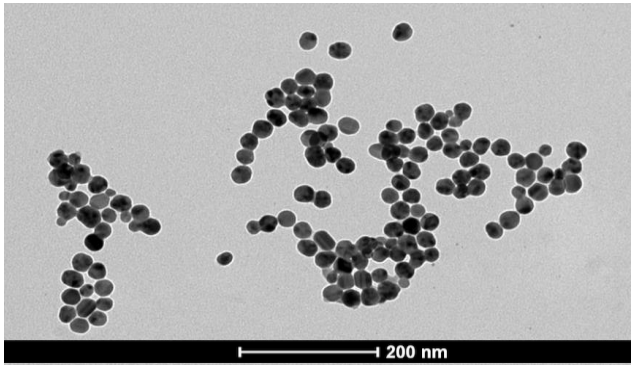




Nanoparticles show unique physico-chemical properties rather then their bulk form mainly due to their large surface area.

Advantages of nanoparticles (NPs), compared to silver cations:

- sustained release of ions
- lower toxicity towards Eukaryotic cell
- nanoparticles specific activity - depending on their physical properties

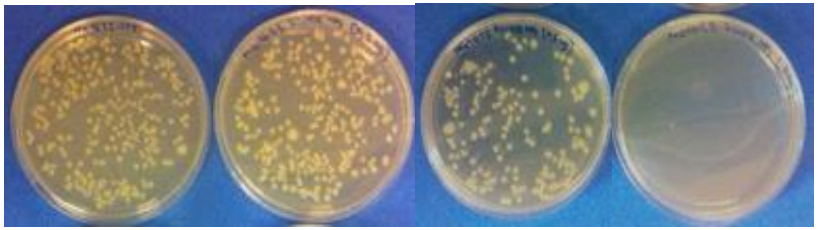


Goal of the project

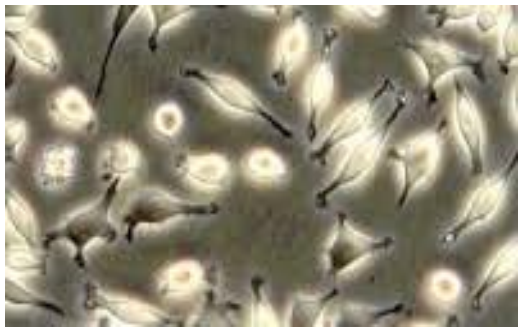
Synthesis, purification and characterization of silver NPs

Test of **antibacterial properties** compared to standard preservatives and study the **mechanism of action**

Ctrl ➔Increasing NPs concentration



Toxicity evaluation in human cells

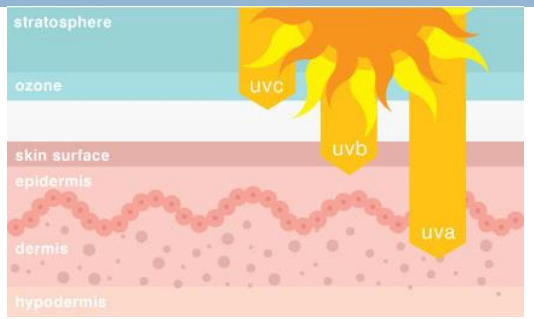


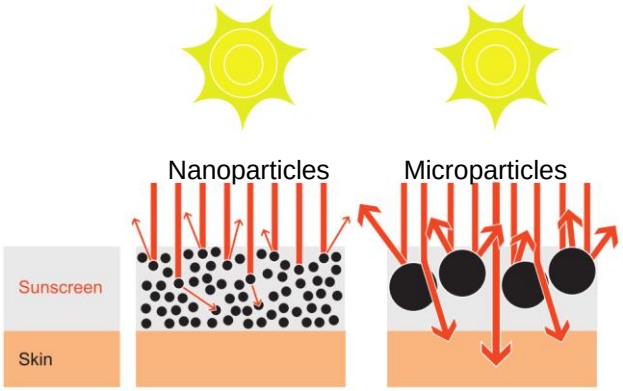
Inclusion of silver NPs in **semisolid formulation**

Future project: UV-A protection with nanoparticles

Actually there is a **lack of UV-A protection** in common sunscreens.

Between chemical and **physical UV filters**, the use of physical one must be preferred because of their intrinsic stability.

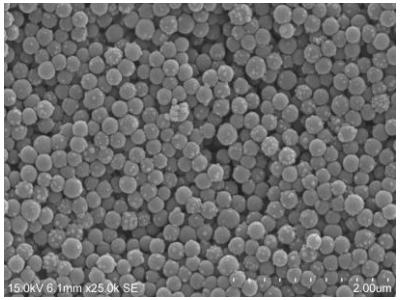




For their **scattering optical properties**, NPs could be promising physical filter.

Compared to higher size material, they have a significant **increase in their effectiveness** of blocking UV light **without changing rheological and transparency** properties of creams and lotions.

Future prospective:
controlled **synthesis and characterization NPs** for this application




Grazie per l’attenzione