



# Surface modification using Nanoparticle to inhibit cellular proliferation

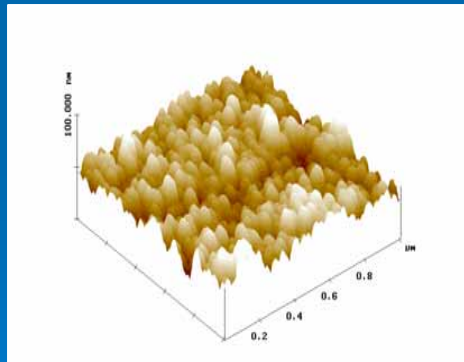
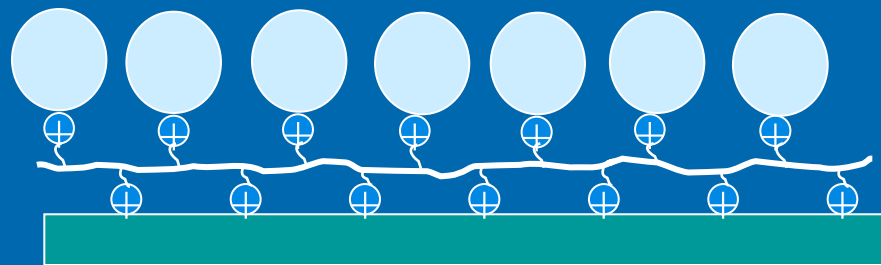
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# Deposition of Nanoparticles to Manipulate Cellular Response

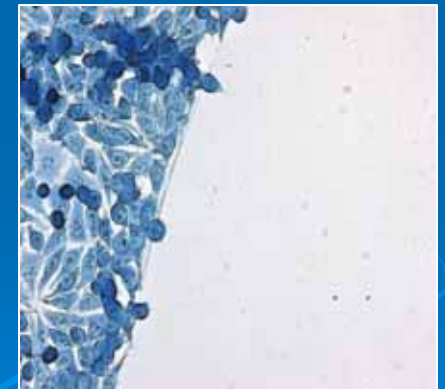
Silica nanoparticles strongly adhered to surfaces via a simple deposition process.

Surfaces show no cytotoxicity but influence the spreading behaviour of the cells. Subsequent reseeding of the cells results in normal growth and spreading.



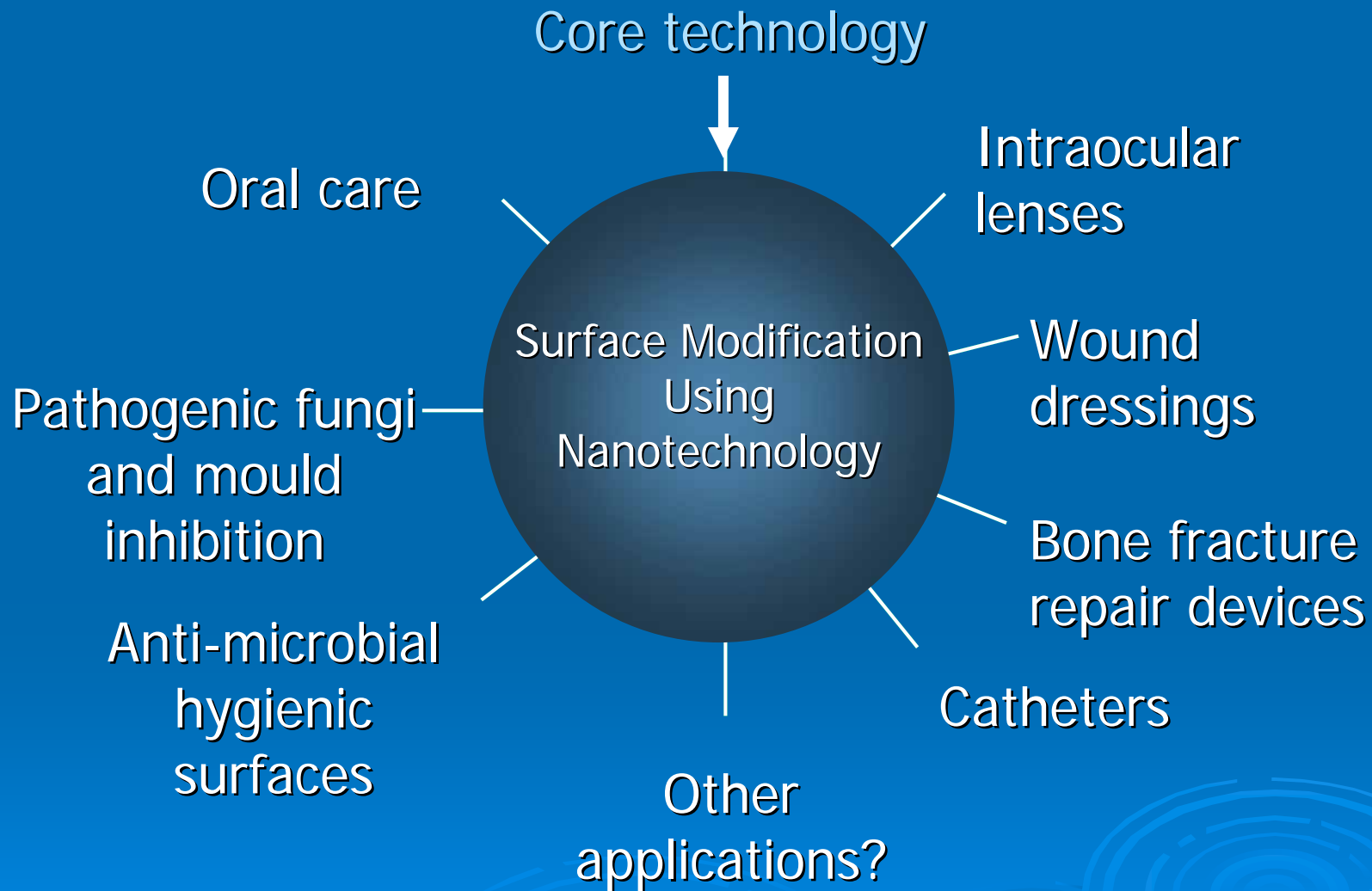
Nanoparticles with sizes <100nm can be deposited

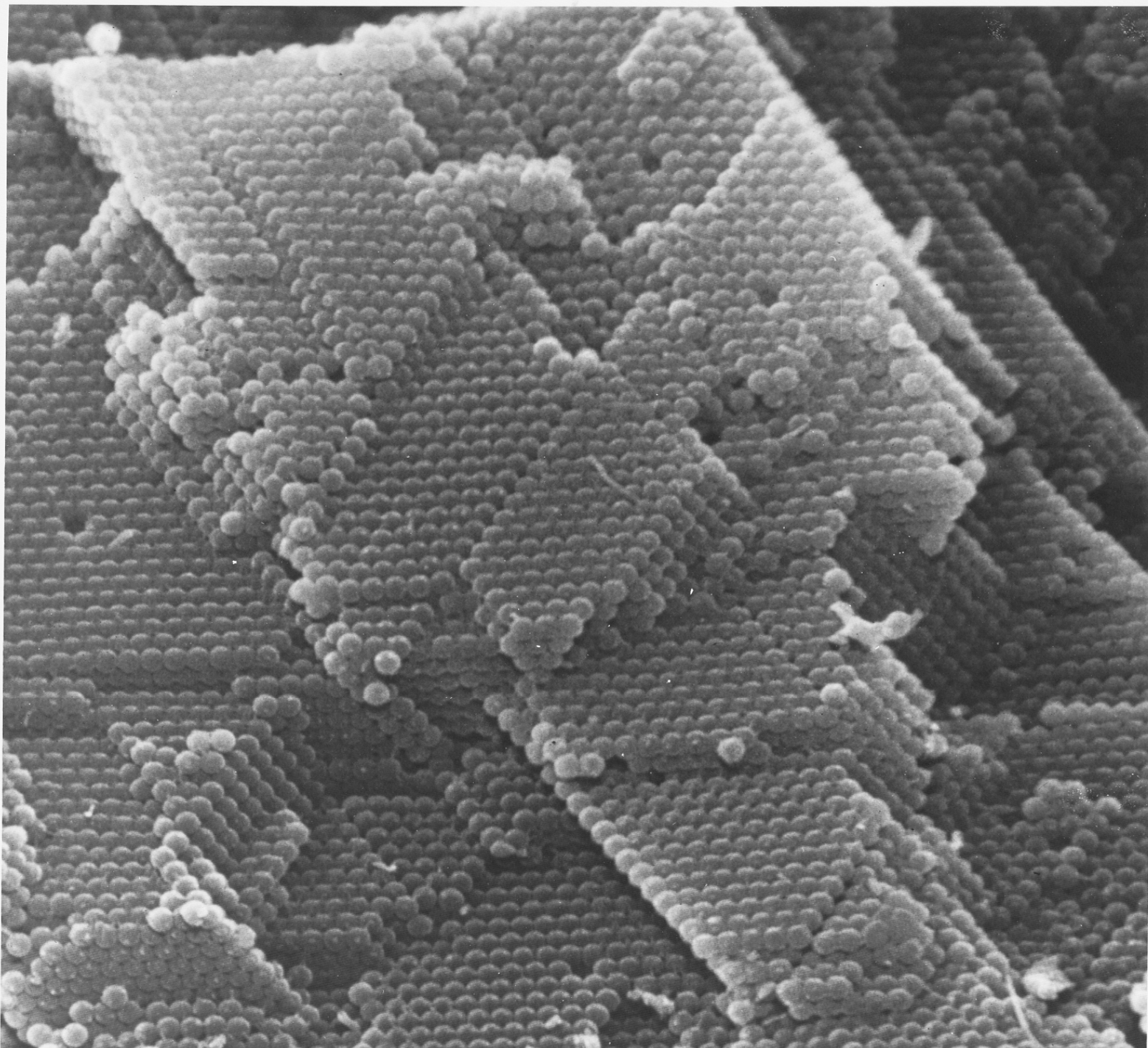
The adhesion of *S. mutans* is reduced on the silica treated surface



Cells on the untreated surface do not spread onto the treated surface.

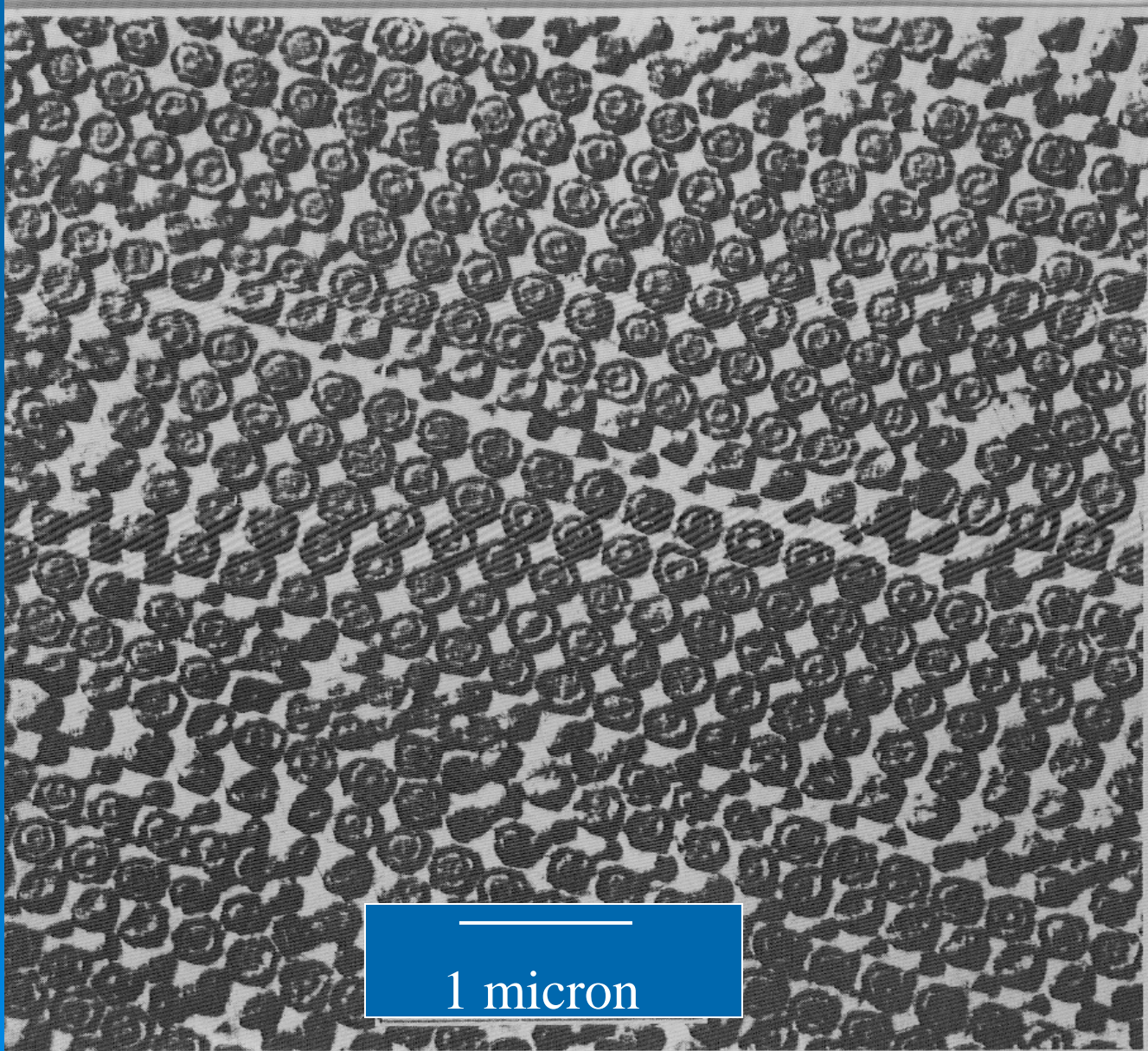
# Potential Applications of Core Technology







# OPAL

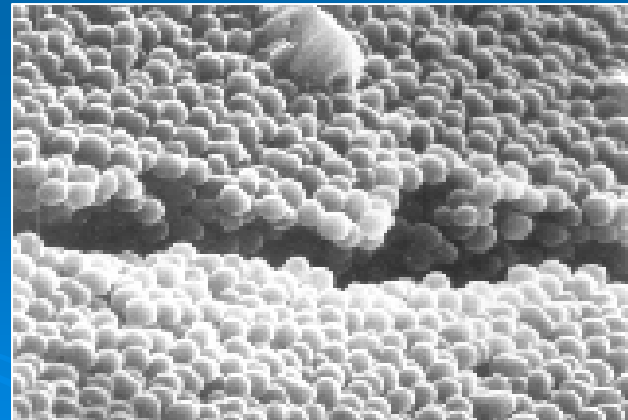


1 micron

- The subunits of colloidal silica are non-porous, spherical particles of  $\sim 10\text{nm}$
- Silica is present in all connective tissues (collagen, arterial cell walls) along with nails, skin and hair
- Exists in nature in plants, diatoms and opal

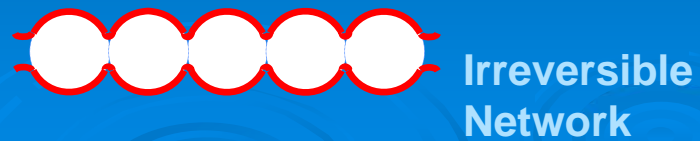
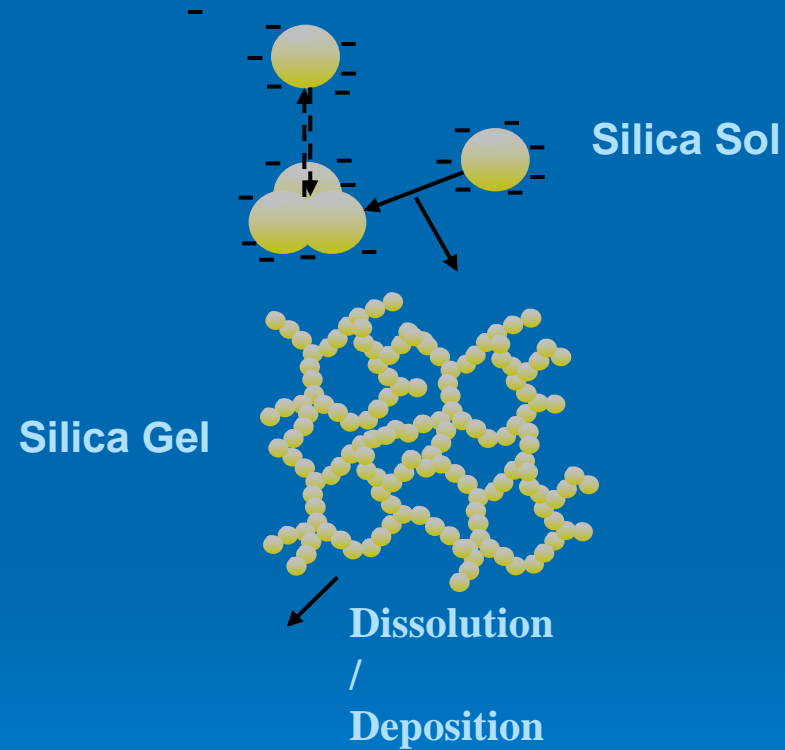


Diatoms

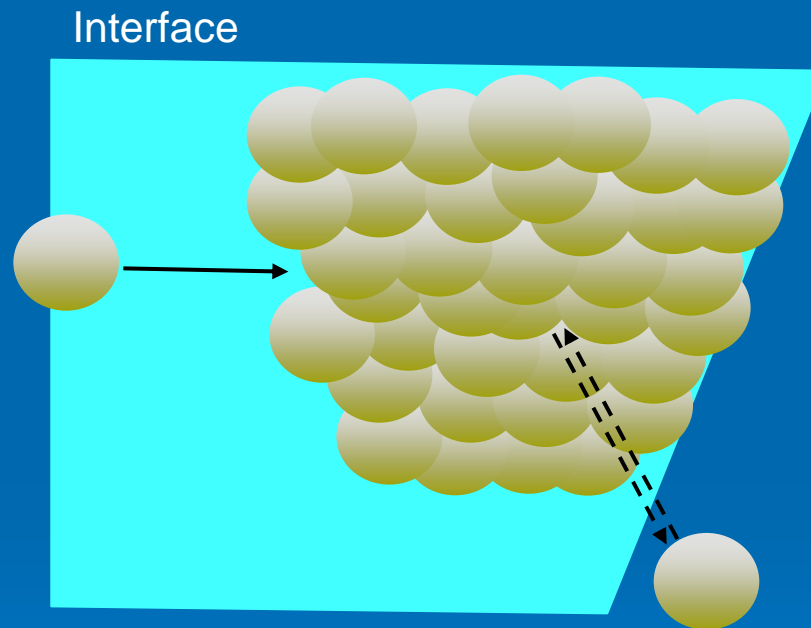
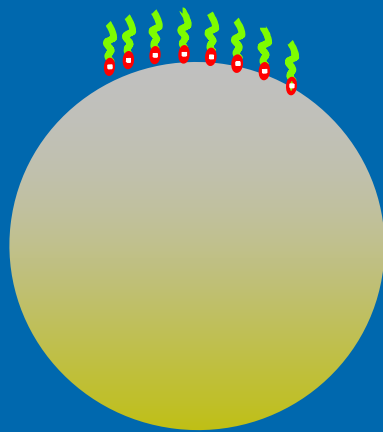


Opal

Colloidal Silica  
aggregates in aqueous  
dispersion to form  
3-dimensional  
irreversible gels



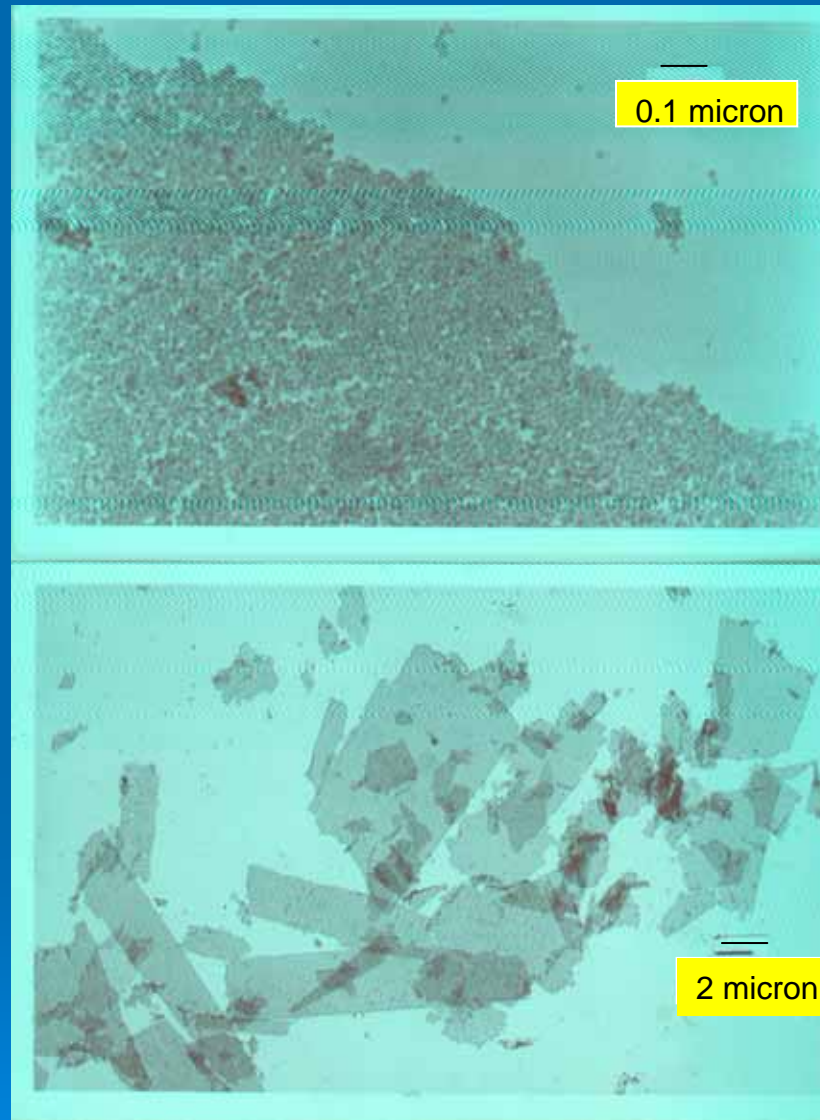
**Low levels of adsorbed cationic surfactant render colloidal silica surface active.**



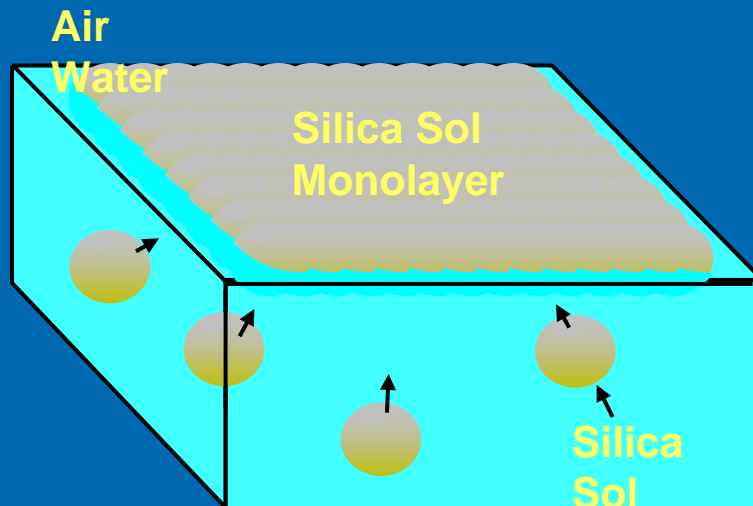
“Interfacial Gelation” of partially hydrophobed silica at an air or hydrophobic interface.



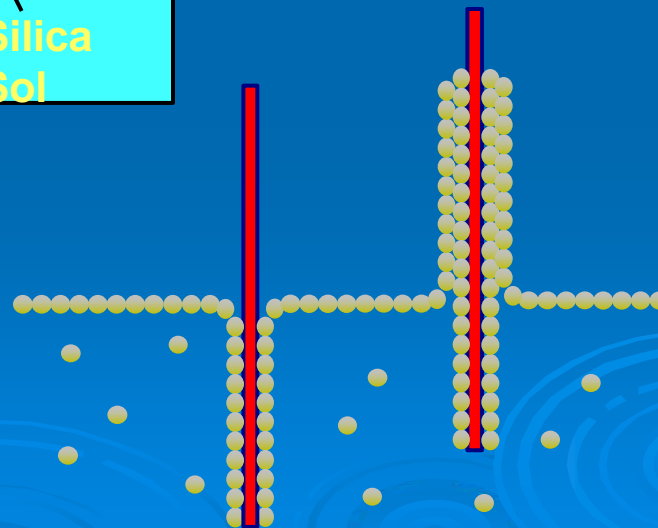
## Two-dimensional aggregates silica



## Interfacial Gelation of partially hydrophobed silica at the air/water interface.



**LANGMUIR-BLODGETT**  
Type Deposition



Electron micrograph  
of interfacial film of  
14 nm silica particles

