



*Seminaris Tecnològics
de la Facultat de
Farmàcia 2013*



Microscòpia de Força Atòmica i les seves Aplicacions

Jordi Borrell – Òscar Domènech

Departament de Fisicoquímica

8 de maig de 2013

B:KC Barcelona
Knowledge
Campus



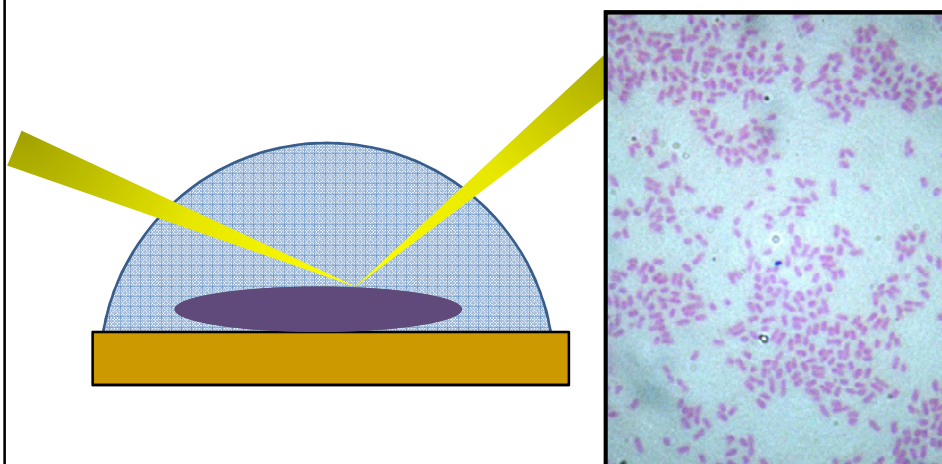
Per què el Microscopi de Força Atòmica ?

Imatges amb ...

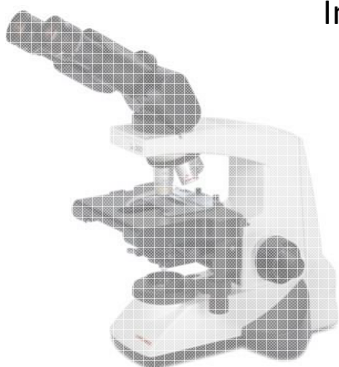


Microscopi Òptic

Microscopi óptic

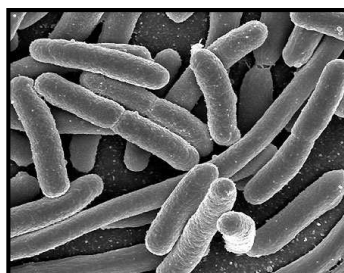
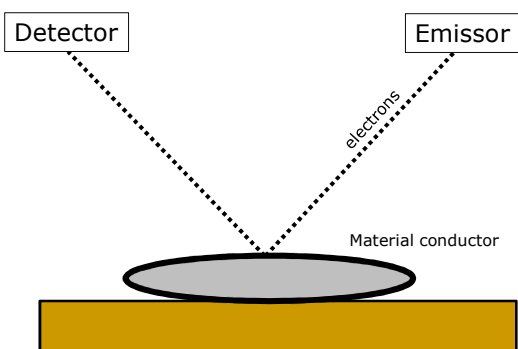


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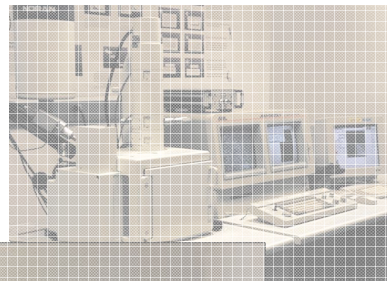
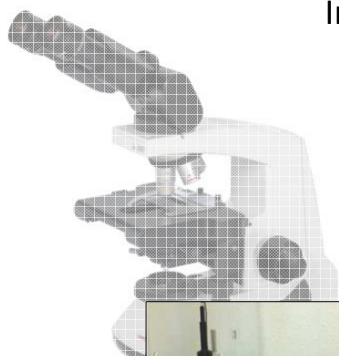


Microscopi Electrònic de Rastreig

Microscopi electrònic de rastreig

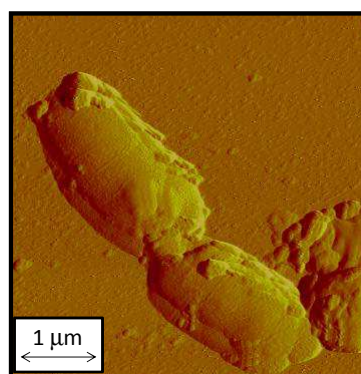
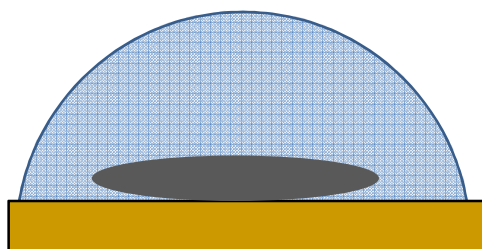


Imatges amb ...



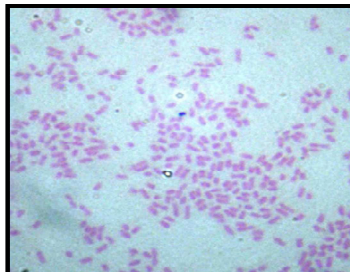
Microscopi de Força Atòmica

Microscopi de força atòmica

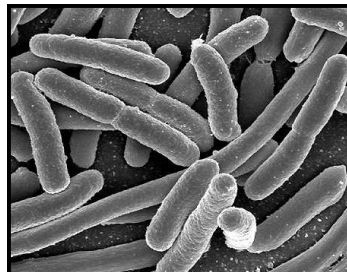


Comparativa

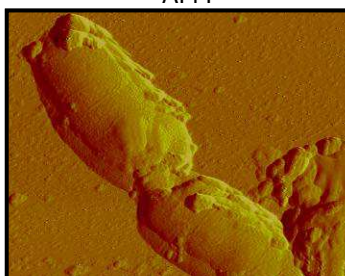
MO



SEM



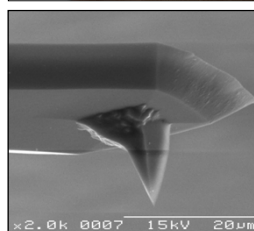
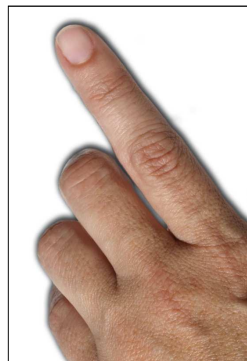
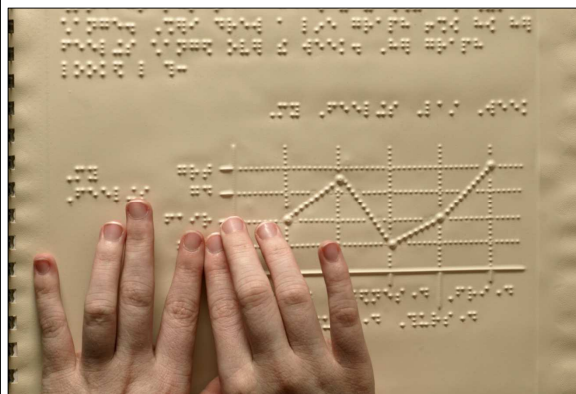
AFM



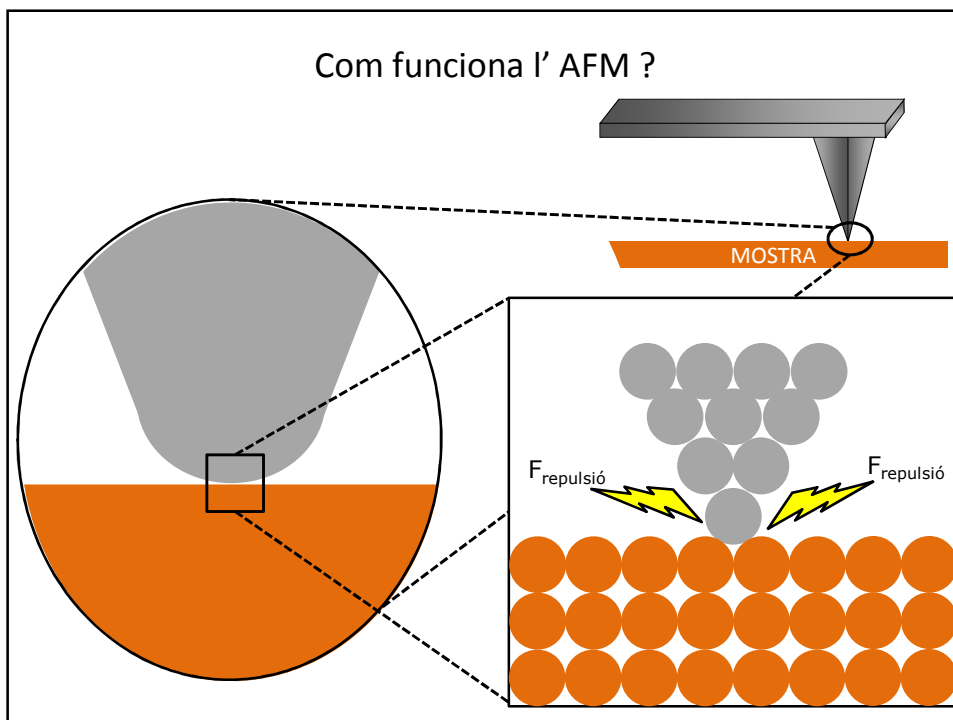
Com funciona l' AFM ?



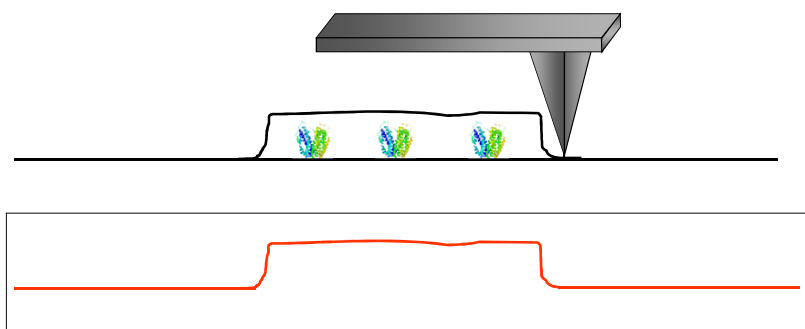
Com funciona l' AFM ?



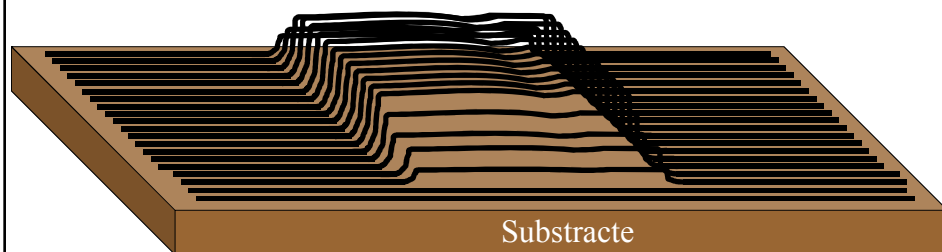
Com funciona l' AFM ?



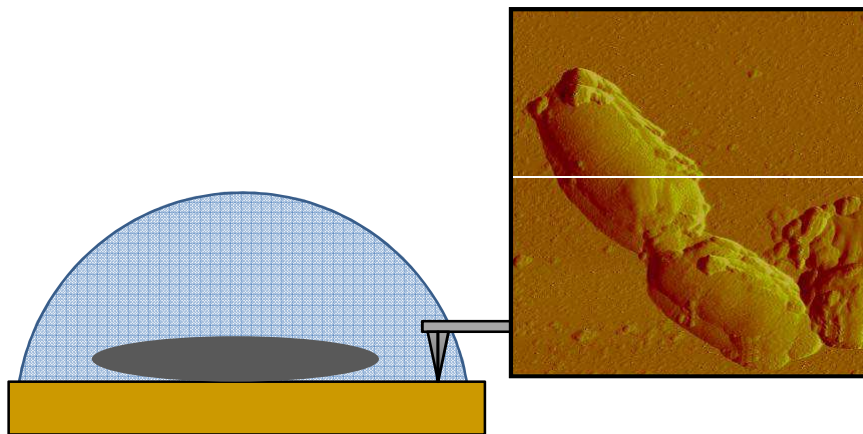
Com funciona l' AFM ?



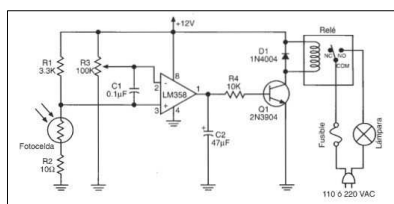
Com funciona l' AFM ?

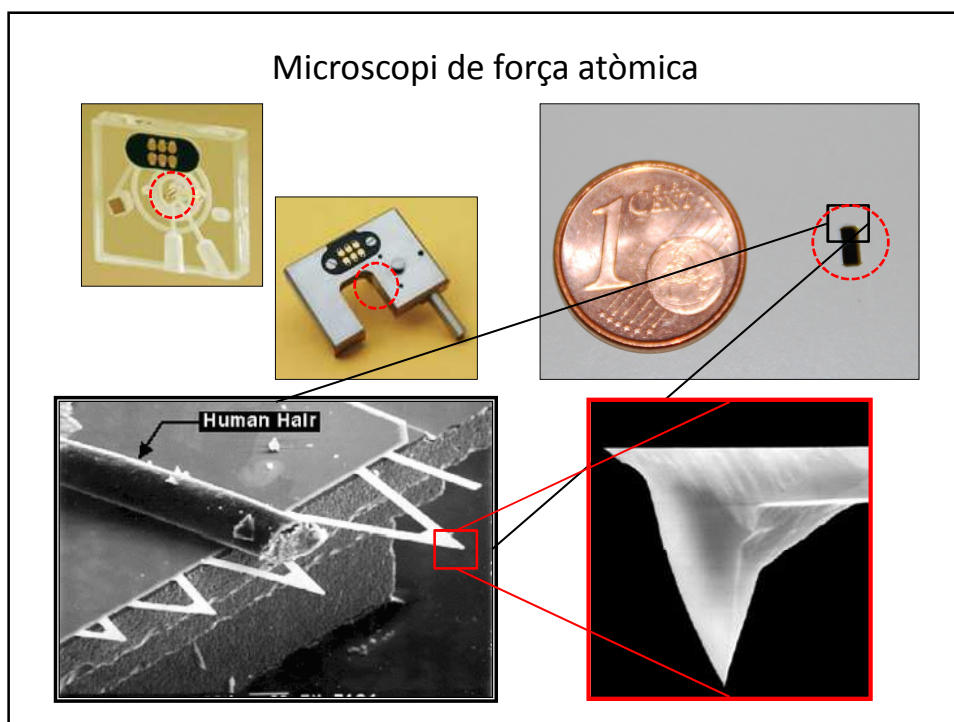
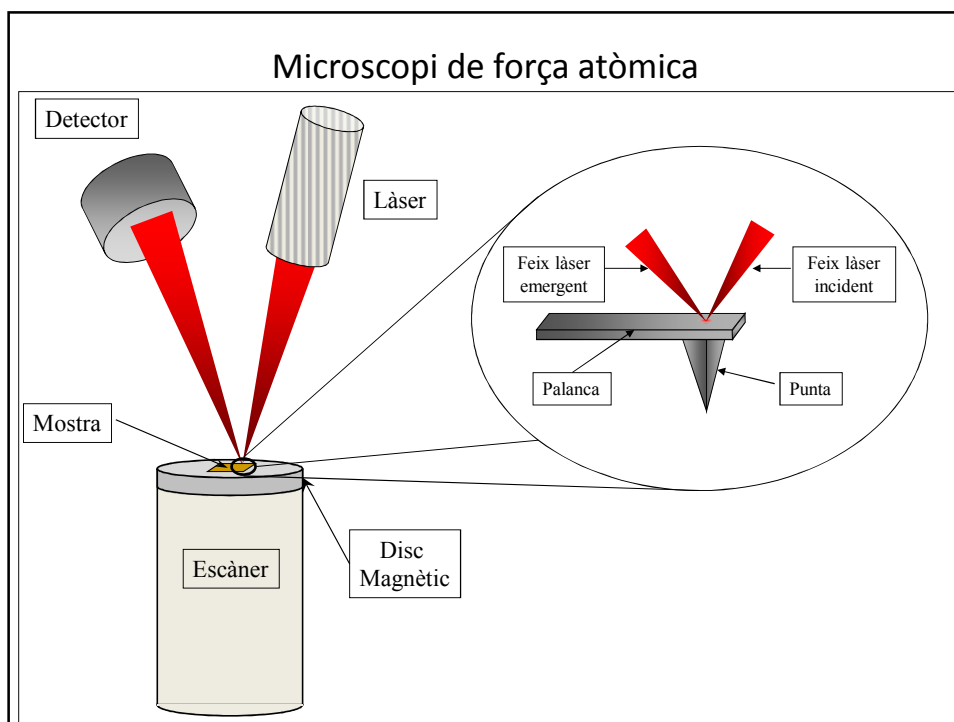


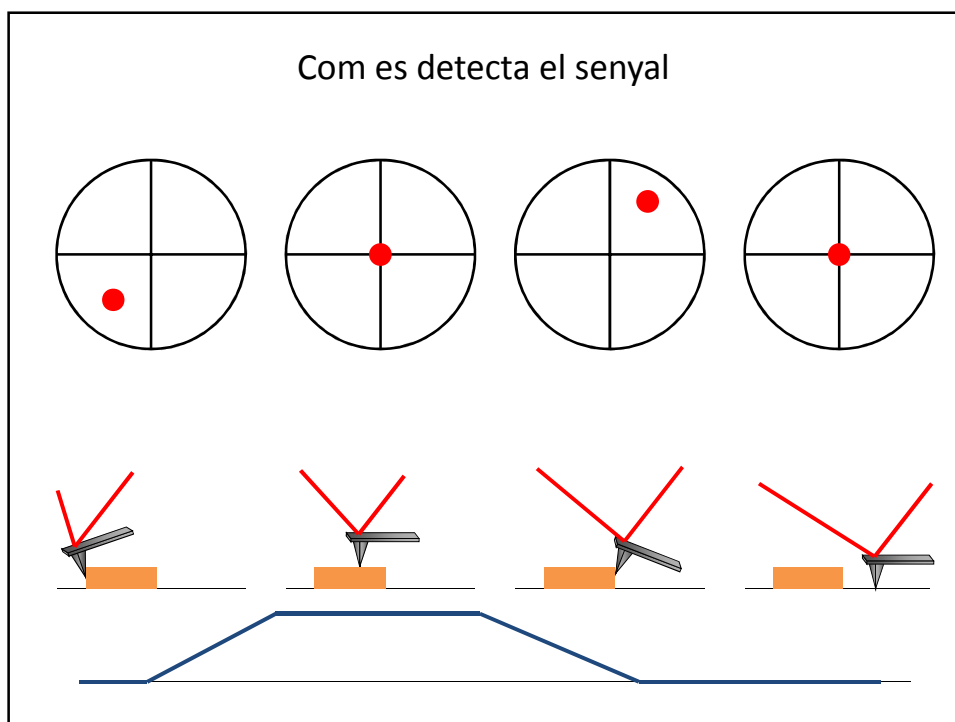
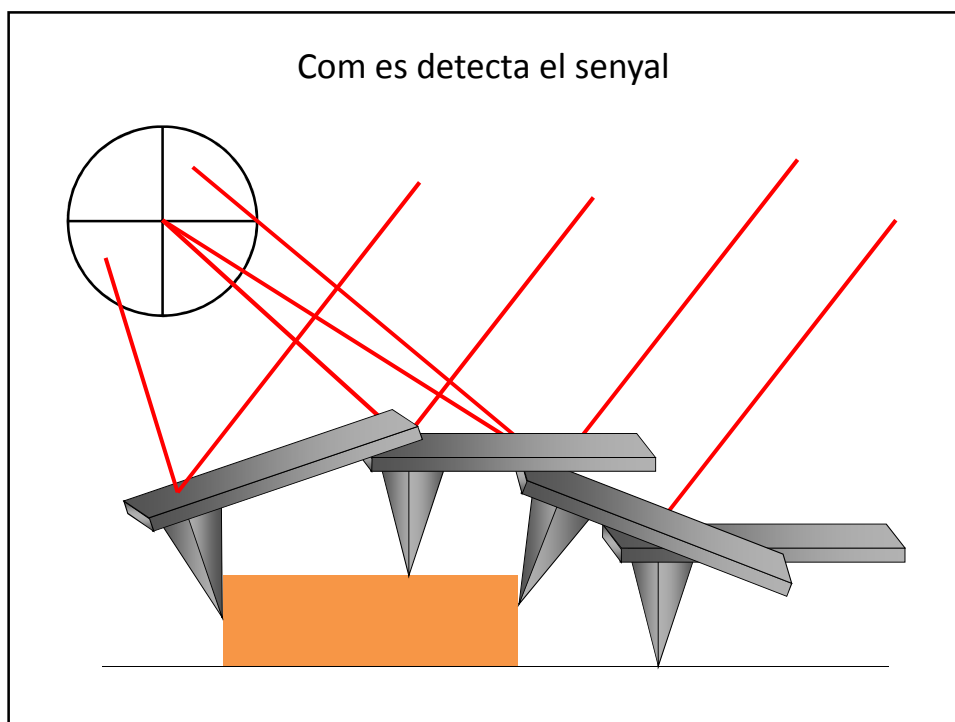
Microscopi de força atòmica



Bases de l' AFM

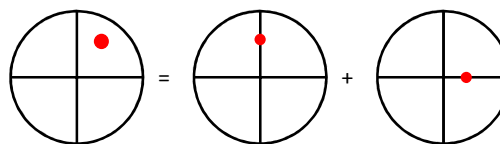






Modes de funcionament

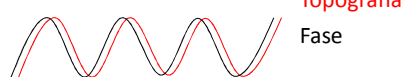
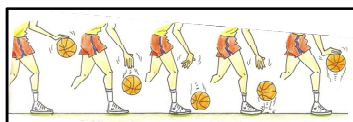
Contacte



Topografia

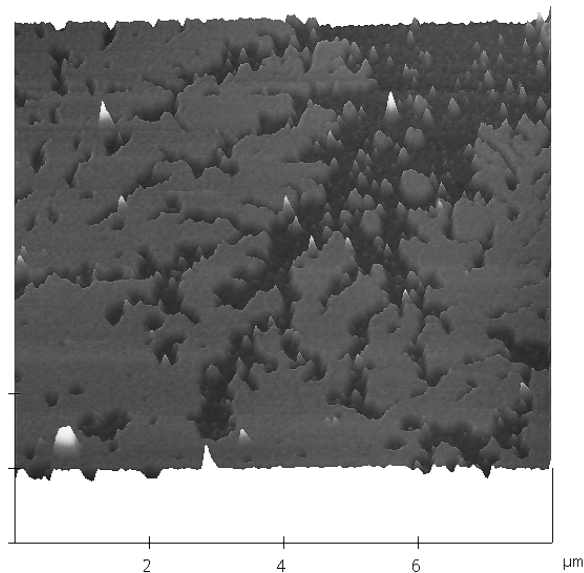
Fricció

Contacte intermitent (*Tapping® Mode*)

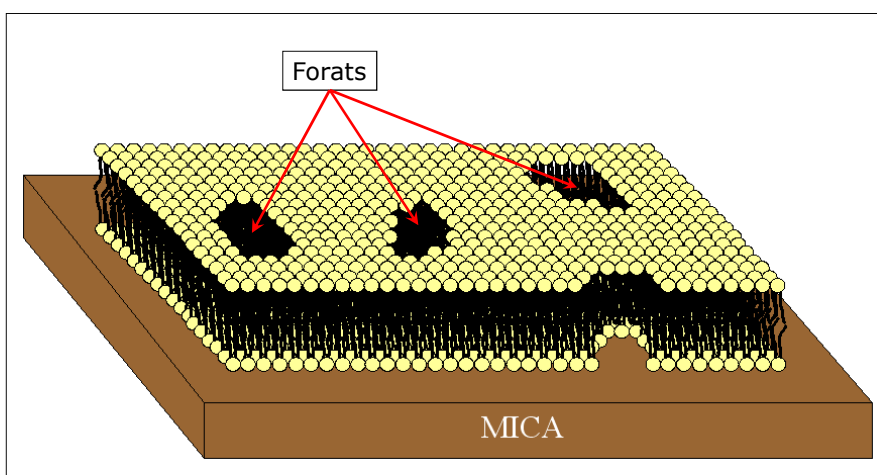


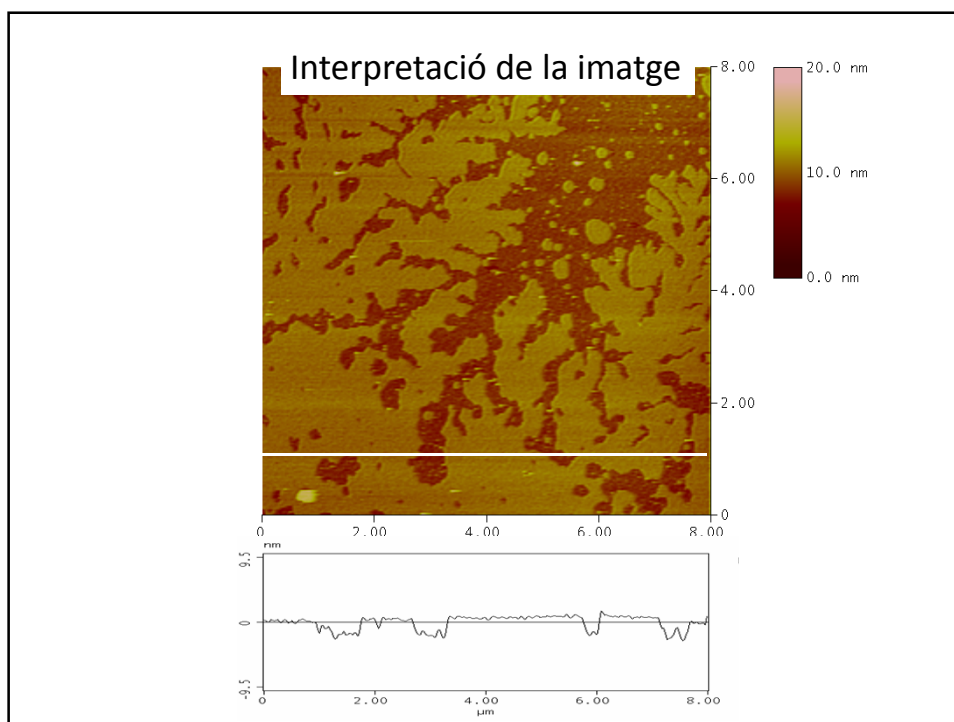
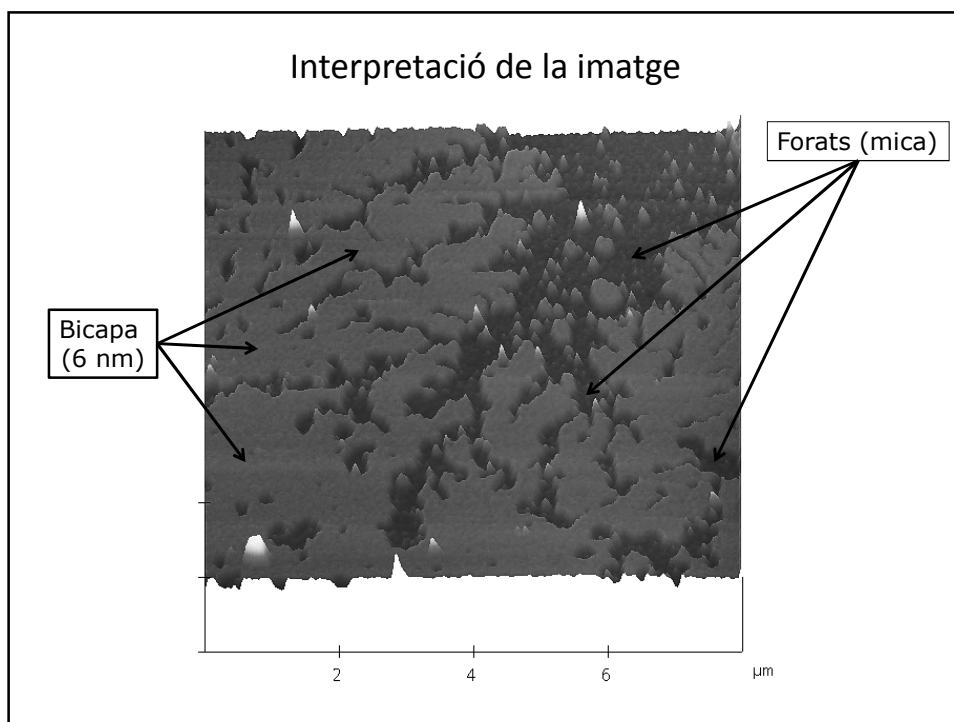
AFM com a microscopi d'imatges

Interpretació de la imatge

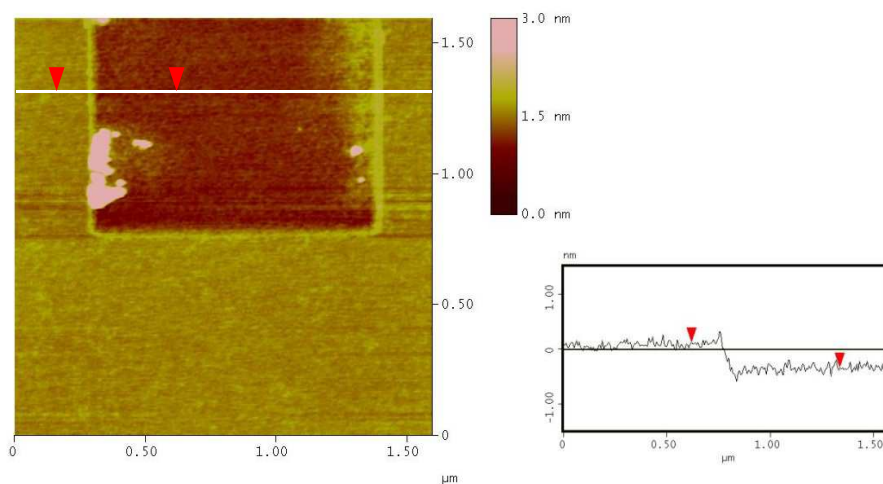


Extensió de liposomes en substrat hidrofílic



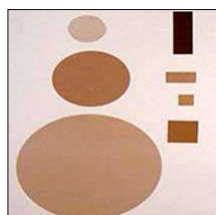
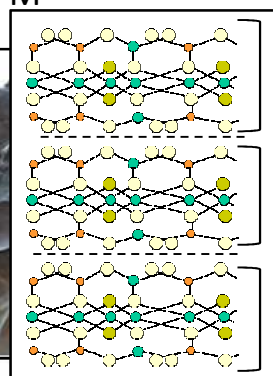


Interpretació de la imatge

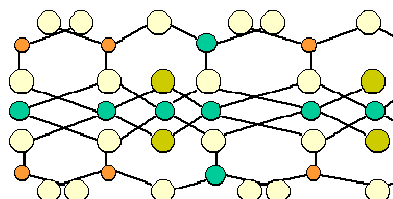


Monocapa a $\pi = 20$ mN/m

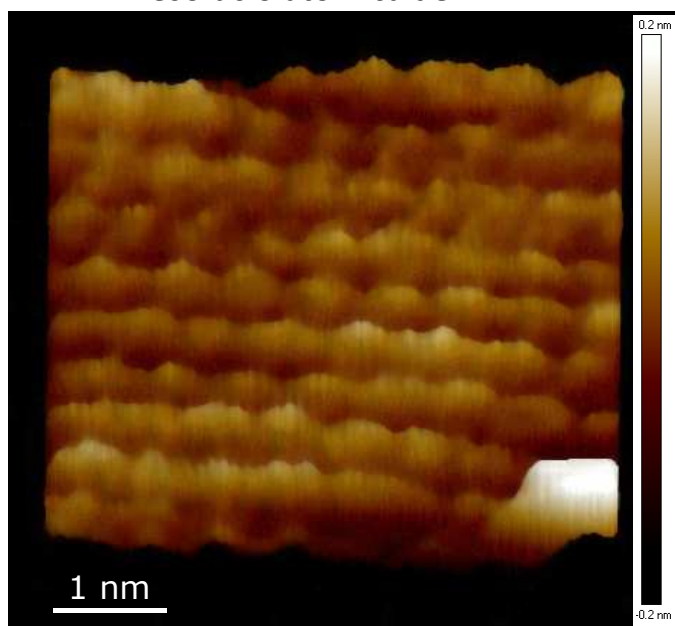
Resolució atòmica de l'AFM



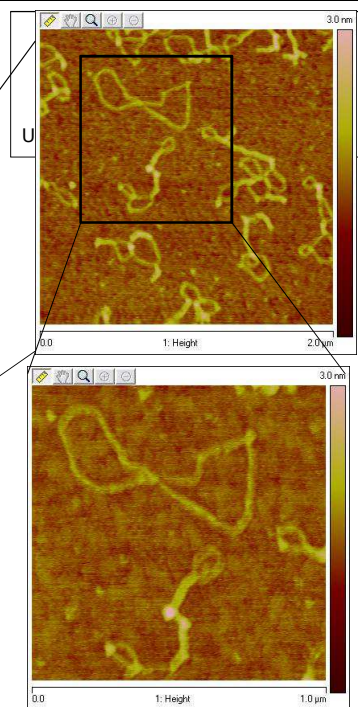
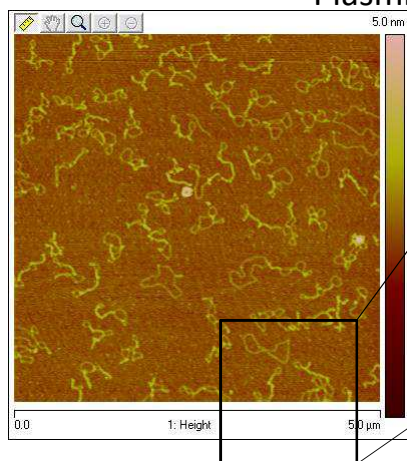
8(O)
3 Si, 1 Al
4(O), 2(OH)
6Al
4(O), 2(OH)
3 Si, 1 Al
6(C)

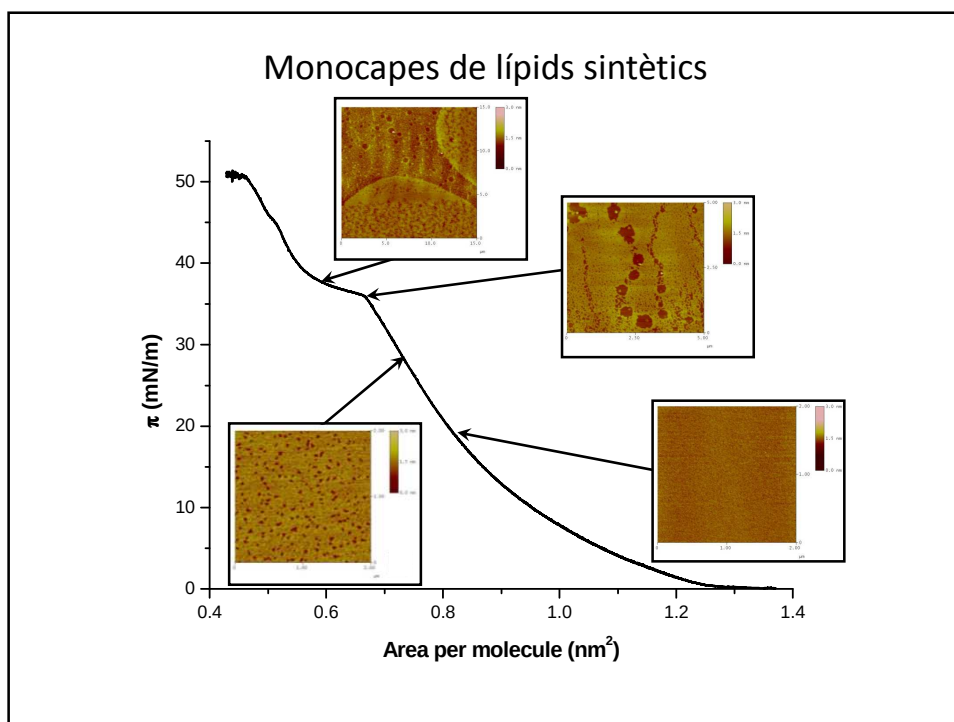
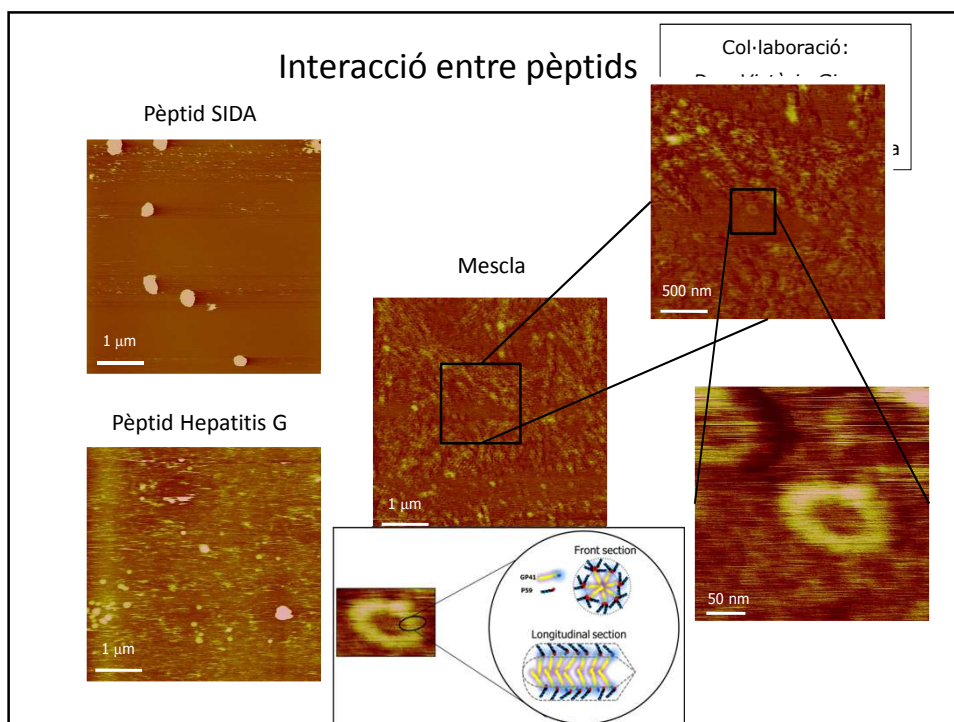


Resolució atòmica de l'AFM



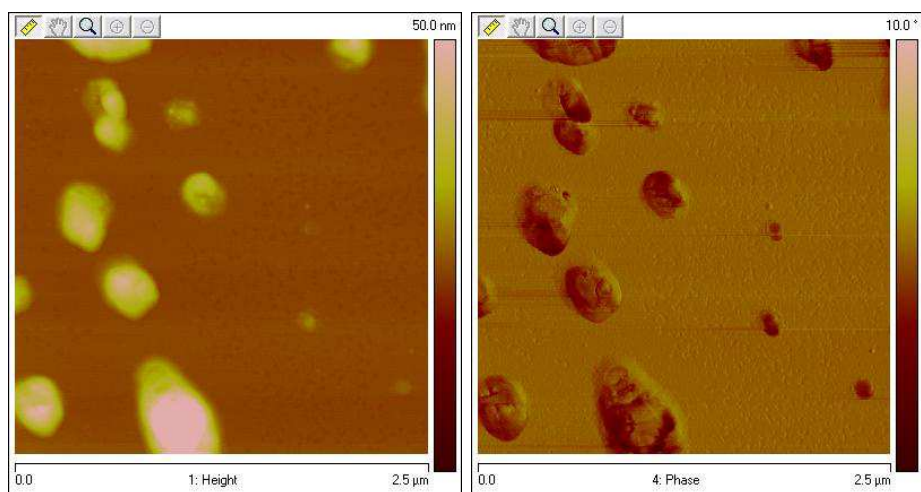
Plàsmid circular





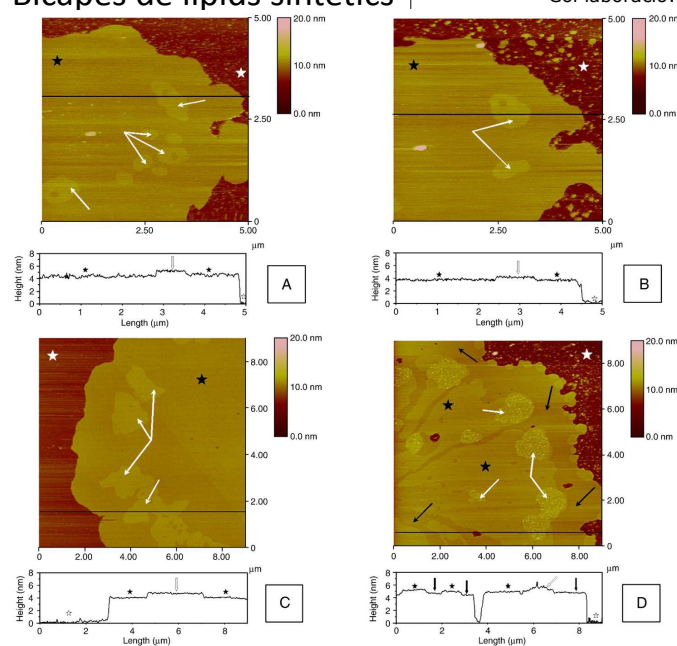
Nanopartícules lipídiques

Col·laboració:
Dra. María Luisa García
Dept. Fisicoquímica
Universitat de Barcelona



Bicapes de lípids sintètics

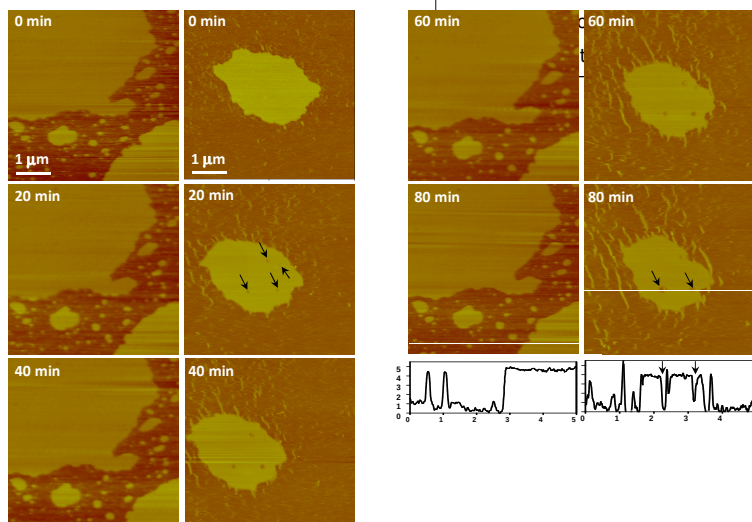
Col·laboració:
Georgios
Georgios i Molecular
rain (Bèlgica)



Bicapes de lípids extrets de *S. aureus*

Col·laboració:

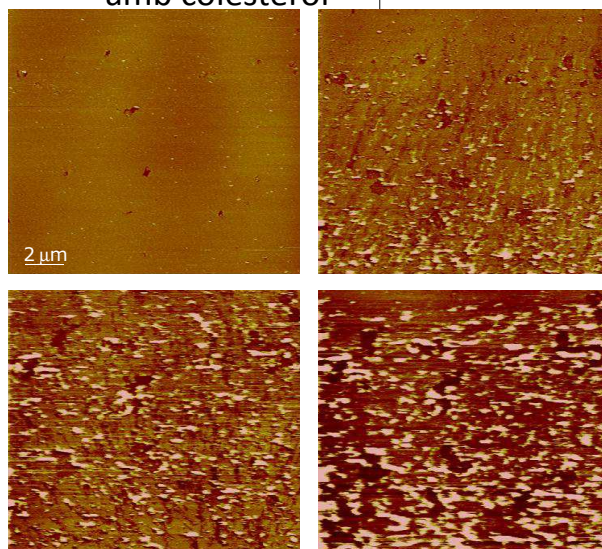
Dra. Marie Paule Mingeot

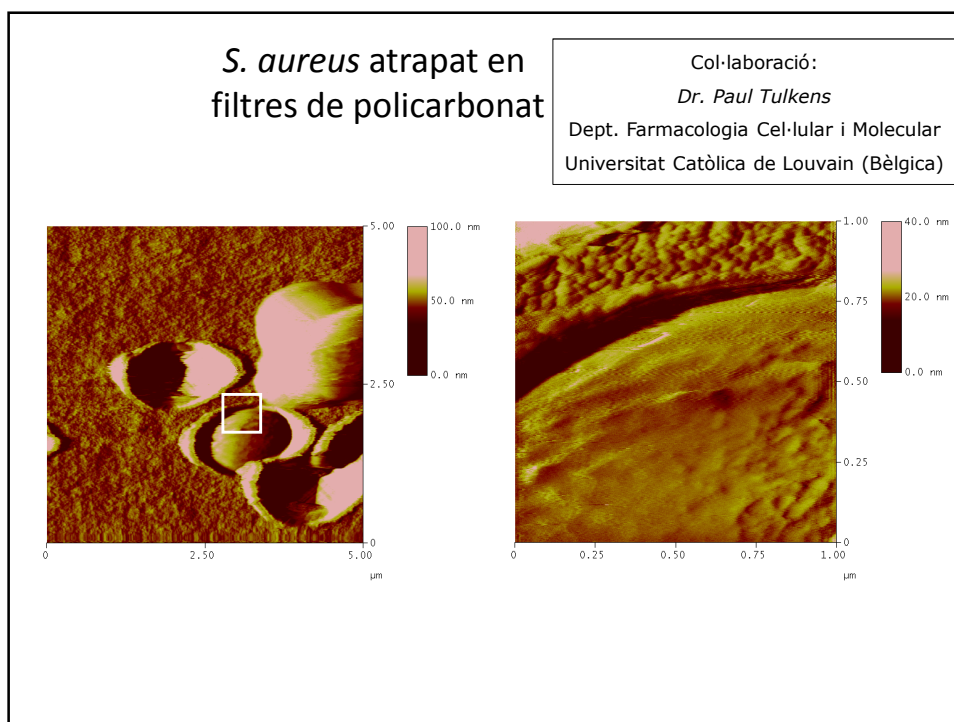
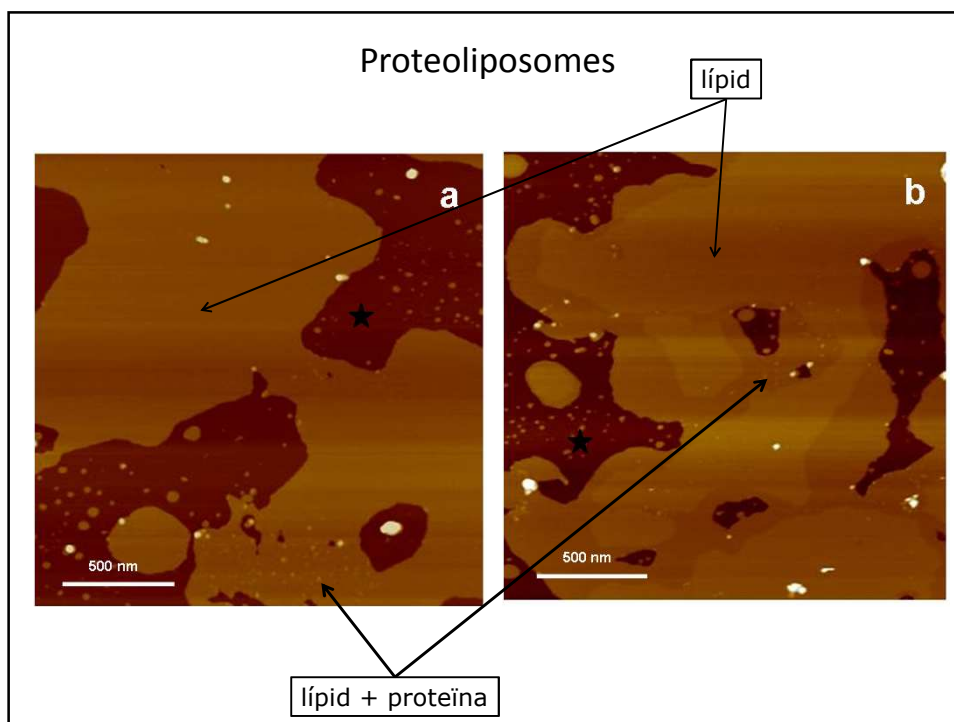
Molecular
(Bèlgica)

Bicapes de lípids amb colesterol

Col·laboració:

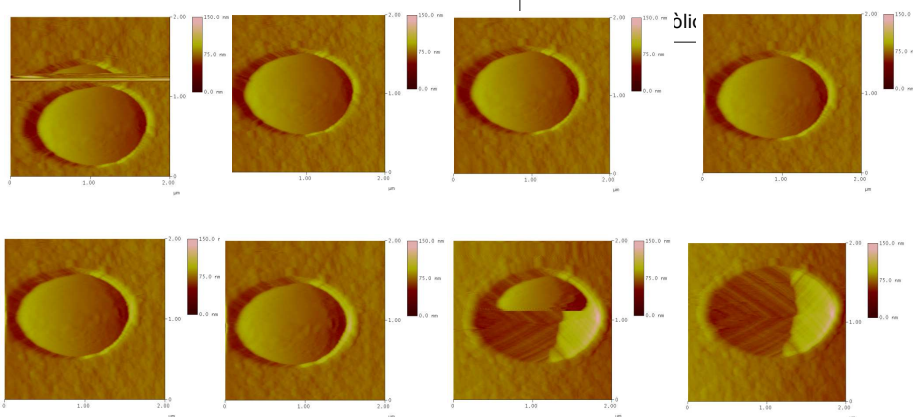
Dra. Marie Paule Mingeot

Molecular i Molecular
Louvain (Bèlgica)

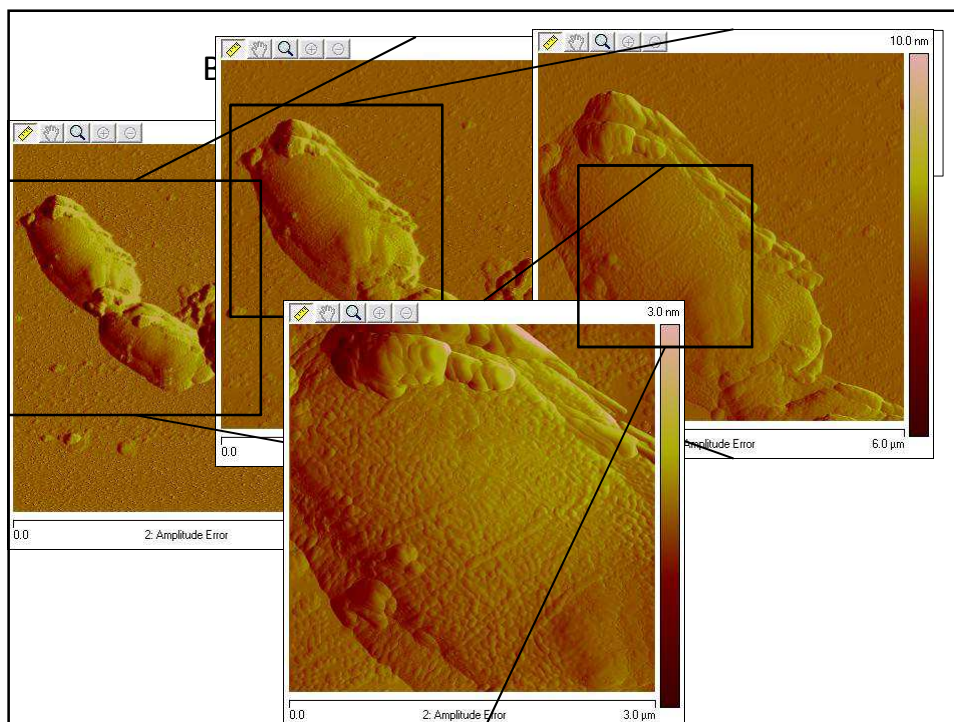


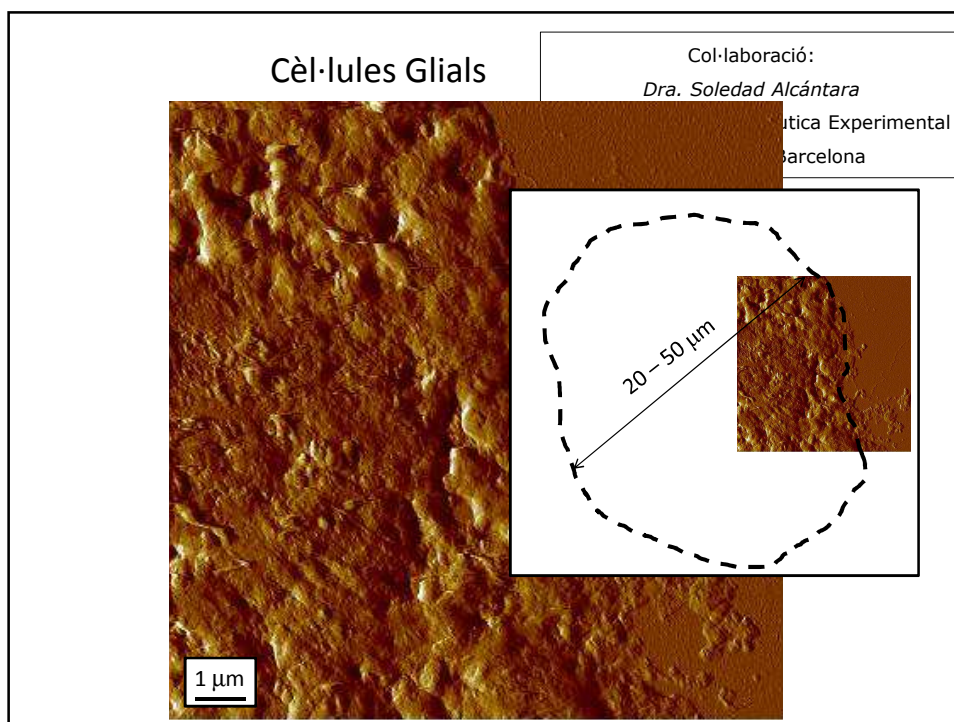
S. aureus atrapat en filtres de policarbonat

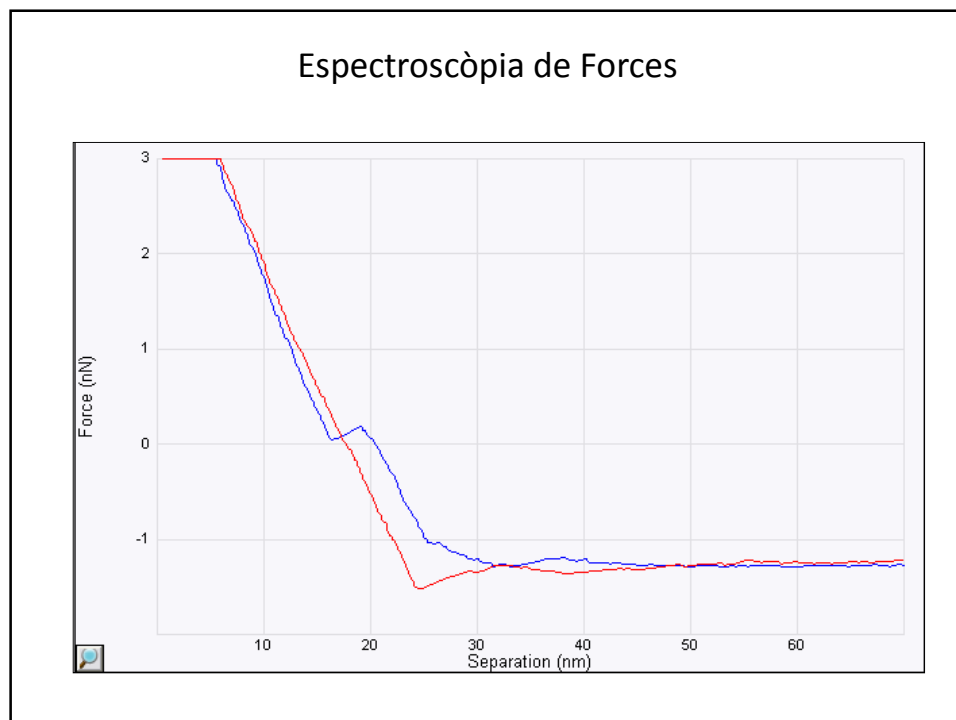
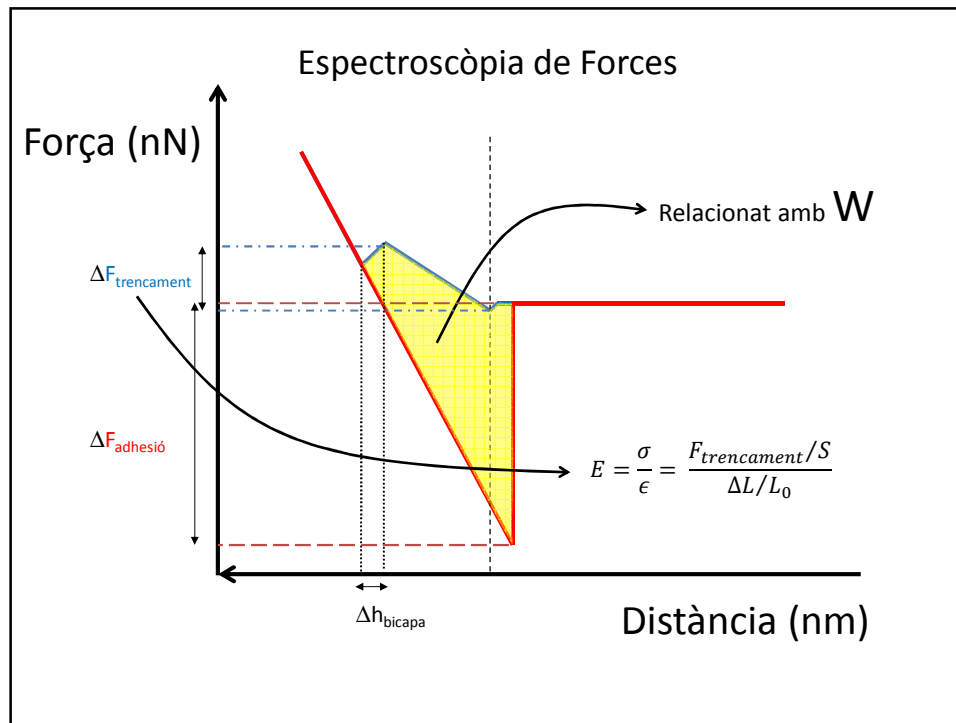
Col·laboració:
Dr. Paul Tulkens
Dept. Farmacologia Cel·lular i Molecular

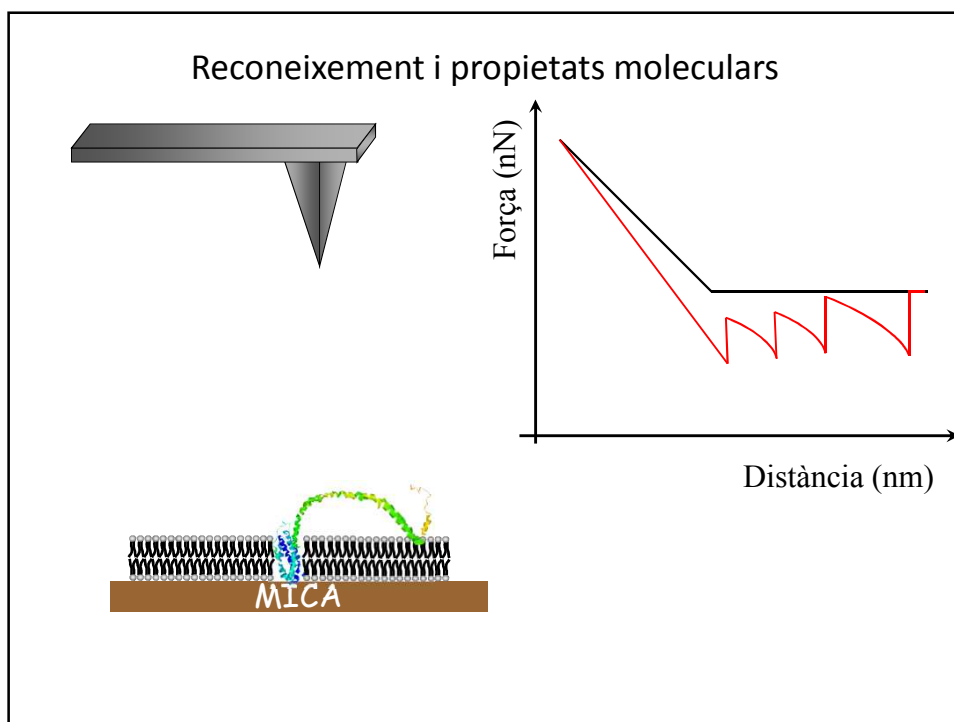
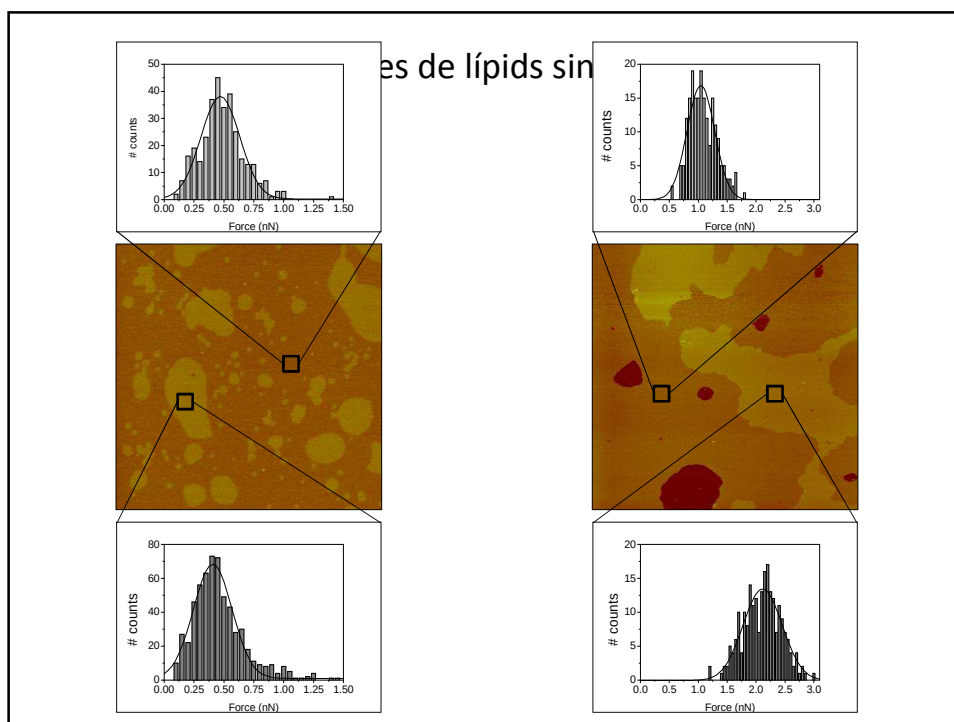


Formació de protoplasts *in situ* amb *lysostaphin*.
 $\Delta t = 12 \text{ min}$

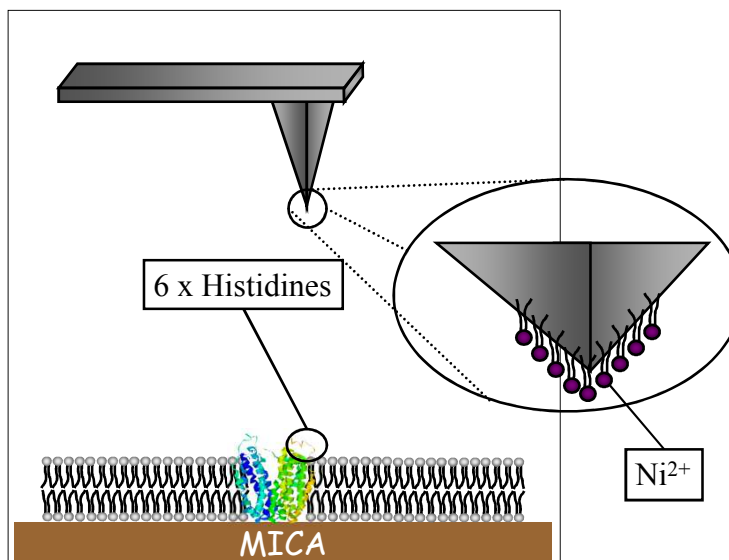




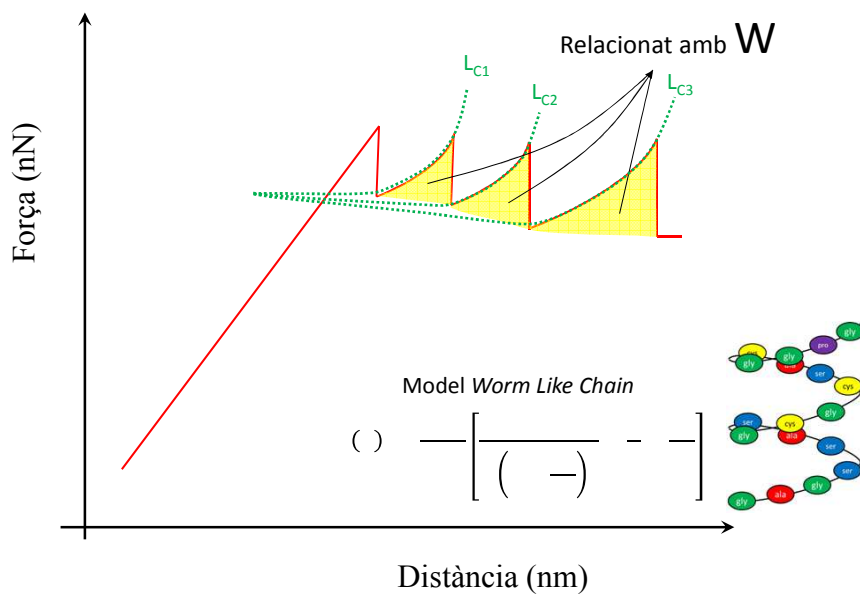




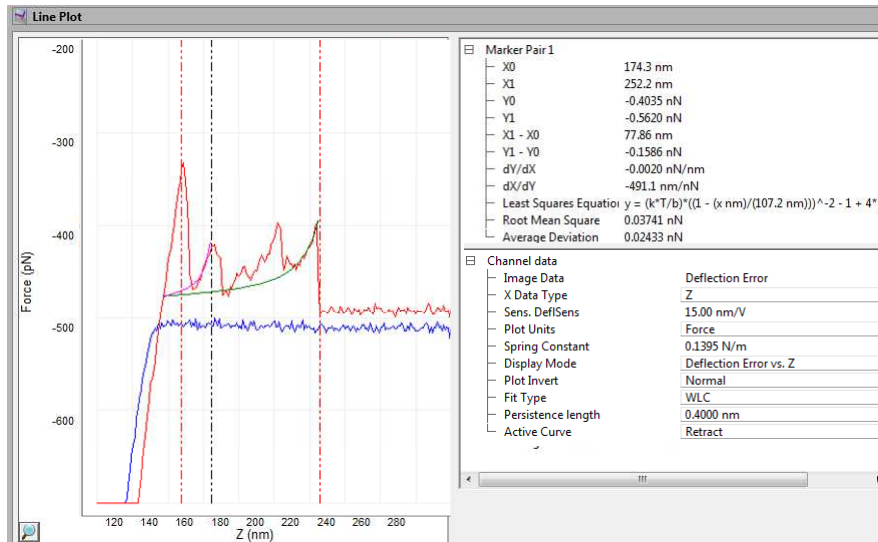
Reconeixement i propietats moleculars



Estirament de proteïnes



Estirament de proteïnes



Imatges de Force-Volume

