

Centros de Apoyo a la Investigación

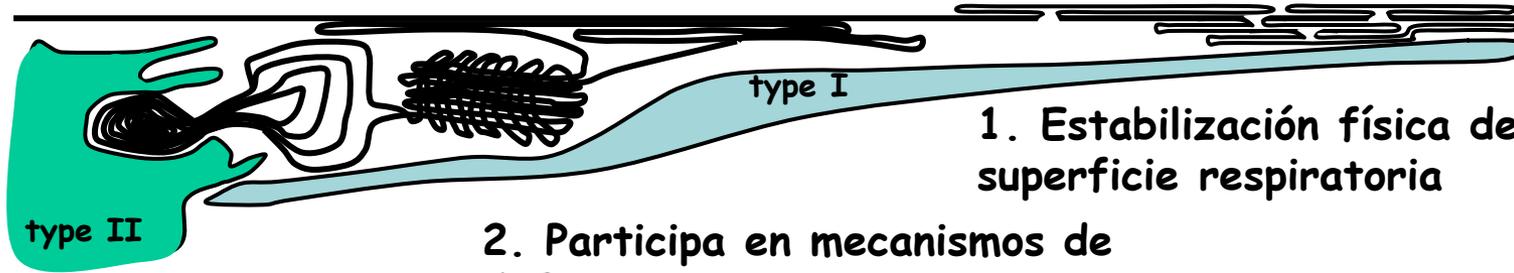
J o r n a d a d e D i f u s i ó n

Jesús Pérez Gil

Estructura de complejos proteína/membrana en el sistema surfactante pulmonar

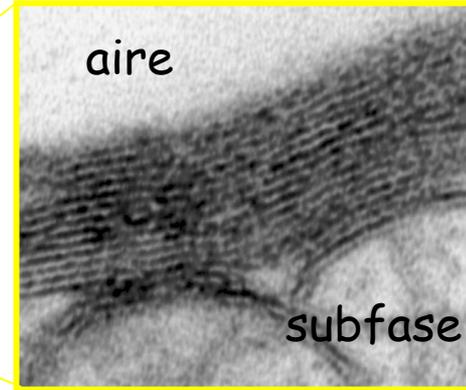
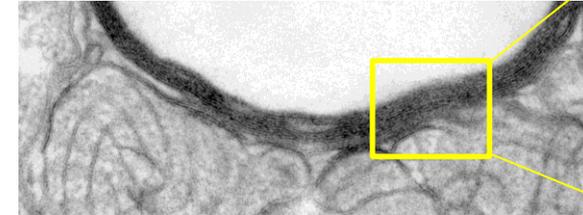
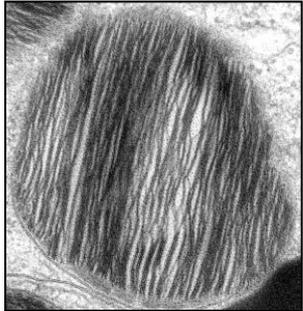
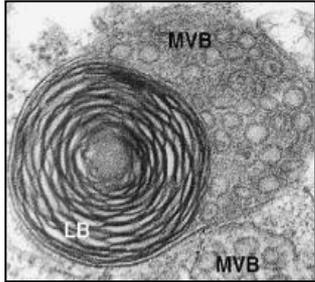
(una investigación CAI-dependiente)

SURFACTANTE PULMONAR



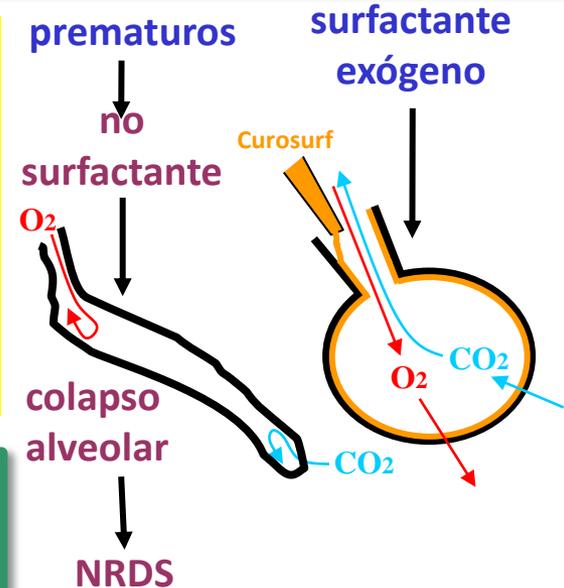
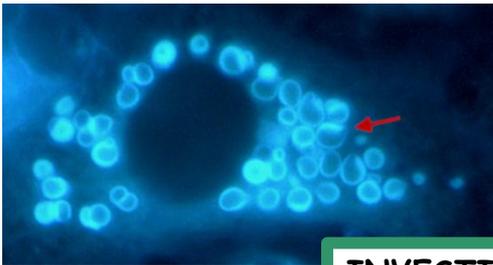
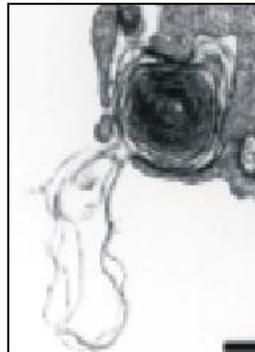
1. Estabilización física de la superficie respiratoria

2. Participa en mecanismos de defensa innata



película interfacial tensioactiva

cuerpos lamelares



INVESTIGACIÓN

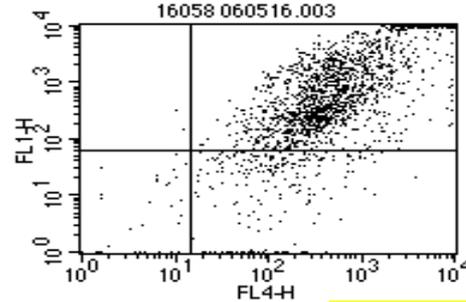
Fundamental: ¿cómo se ensambla? ¿cómo funciona?

Proyección: producción de mejores surfactantes terapéuticos

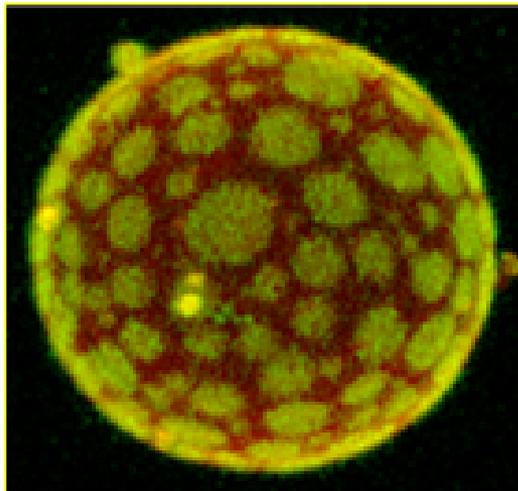
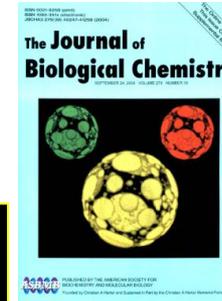
SURFACTANTE PULMONAR

Análisis del efecto de proteínas/fármacos
sobre poblaciones de vesículas

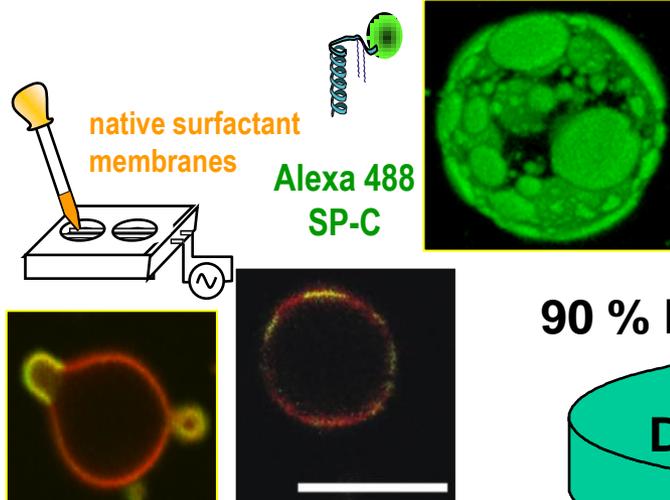
C.A.I.
Citometría y
microscopía de fluorescencia
microscopía de
fluorescencia confocal



B. de la Serna et al. (2004), JBC 279, 40715
B. de la Serna et al. (2009) Biophys J 97, 1381
E. Lopez-Rodriguez et al. (2013) JBC 288, 29872

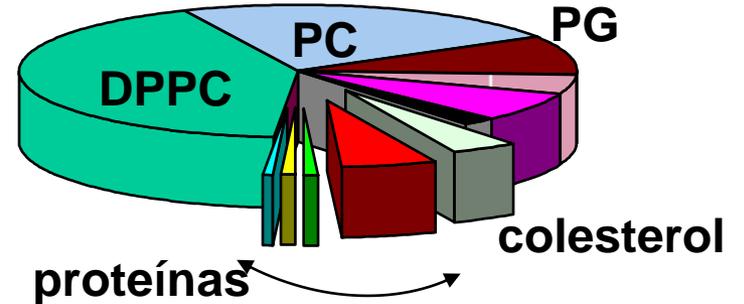


estructura heterogénea de las membranas del surfactante

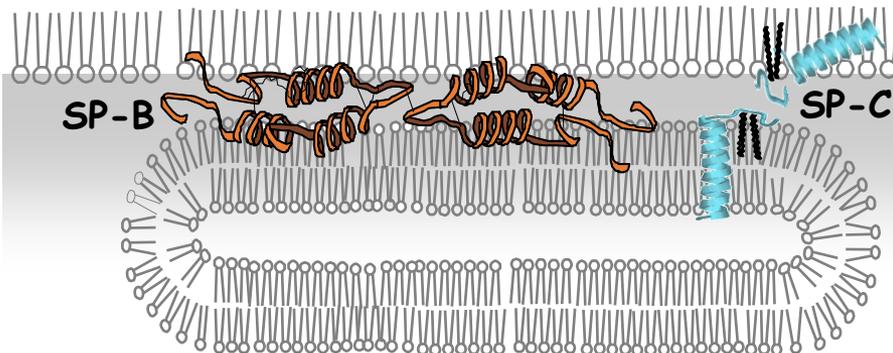


distribución preferencial de las proteínas

90 % lípidos



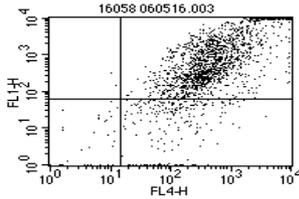
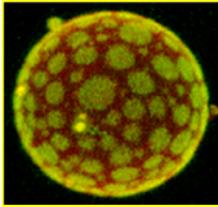
- 6% SP-A
- 1% SP-B
- 1% SP-C
- < 0.5% SP-D



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Citometría y microscopía de fluorescencia



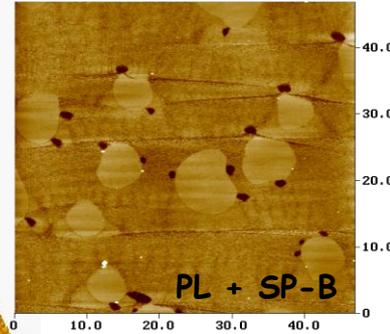
estructura submicroscópica de membranas y películas interfaciales

Microscopía de fuerzas atómicas (AFM)

Lukovic et al., (2012) Langmuir 28, 7811

Blanco et al. (2012) BBA 1818, 2756

Suri et al. (2013), BBA 1828, 1707



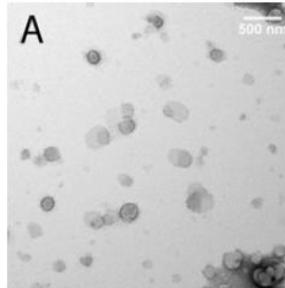
I.C.T.S.

Centro Nacional de Microscopía

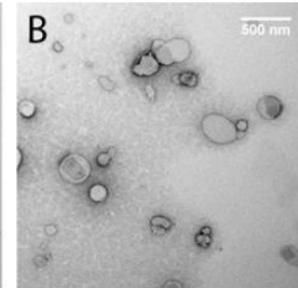
estructura de membranas y complejos lipoproteicos
Microscopía Electrónica (tinción negativa)

Parra et al. (2011), Biochem J 438, 555

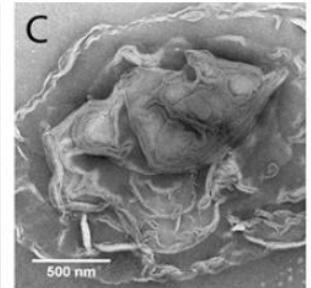
B. De la Serna et al. (2013) Faraday Disc. 161, 535



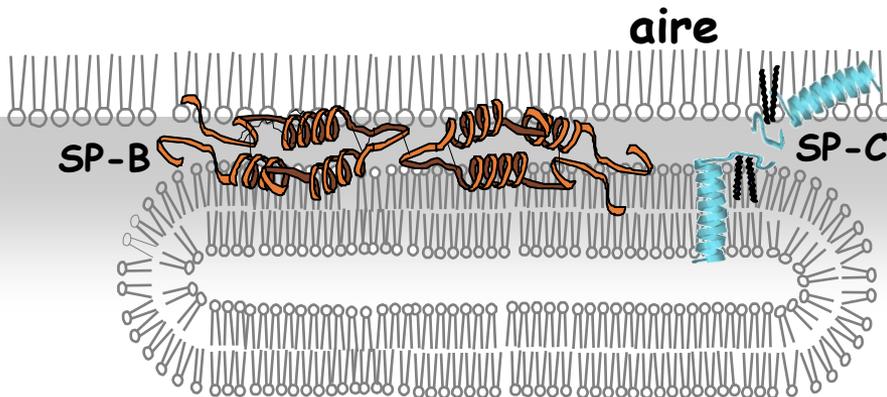
POPC vesicles (100 nm)



POPC vesicles +SP-B/C



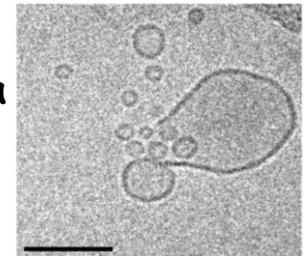
POPC vesicles +SP-B



Criomicroscopía Electrónica

Microscopía Electrónica C.I.B. - C.S.I.C.

Roldan et al. (2016), Biophys J 111, 1703

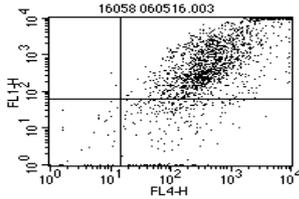
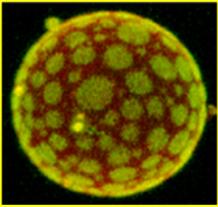


POPC vesicles +SP-C

SURFACTANTE PULMONAR

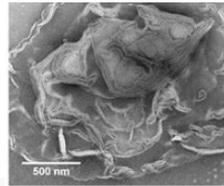
C.A.I.

Citometría y microscopía de fluorescencia

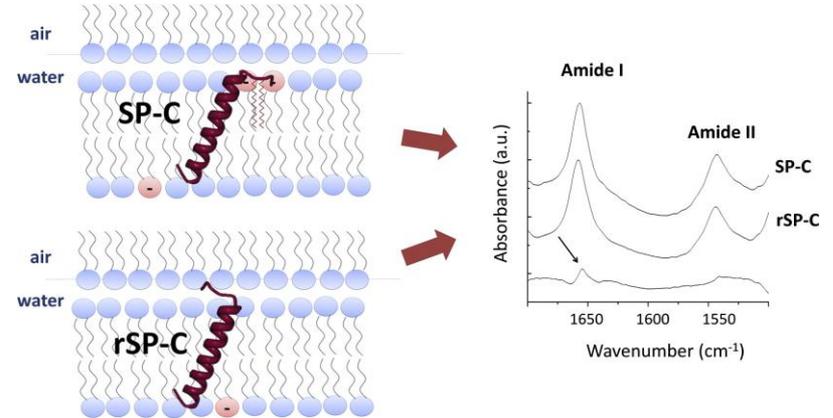
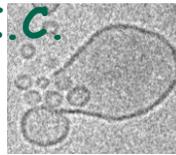


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Centro Nacional de Microscopía



Microscopía
C.I.B. - C.S.I.C.

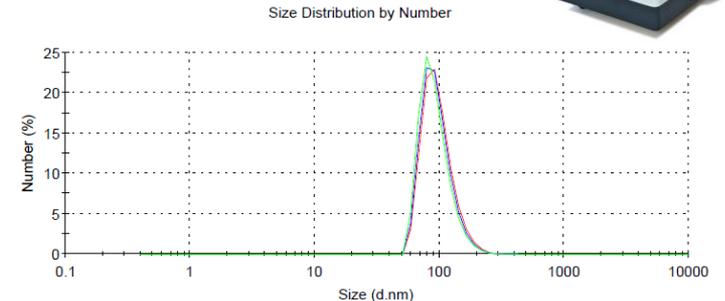
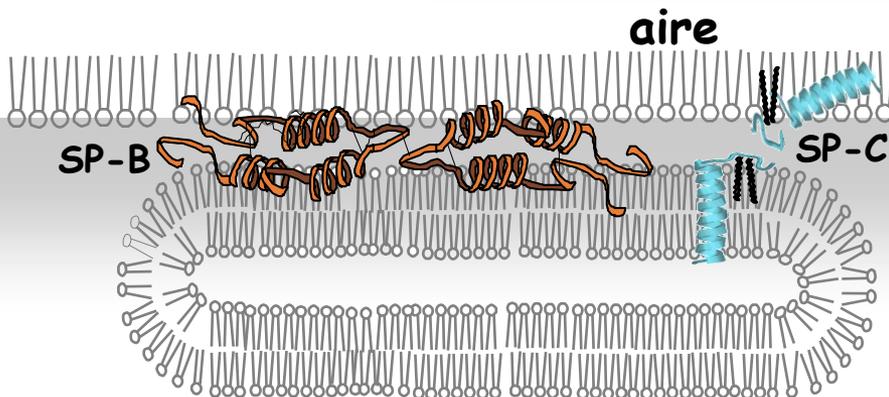


Estructura y orientación de proteínas en membranas
Espectroscopía infrarroja (FTIR y ATR)

C.A.I.

Espectroscopía y Correlación

tamaño y polidispersión de partículas
Dispersión de luz dinámica (DLS)

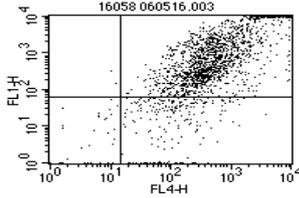
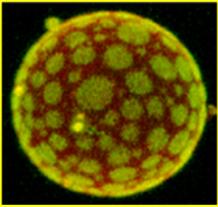


Record 255: 230614 DPPCPOPCPOPG 100-2 1
Record 256: 230614 DPPCPOPCPOPG 100-2 2
Record 257: 230614 DPPCPOPCPOPG 100-2 3

SURFACTANTE PULMONAR

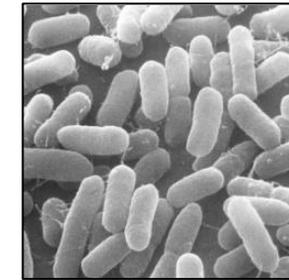
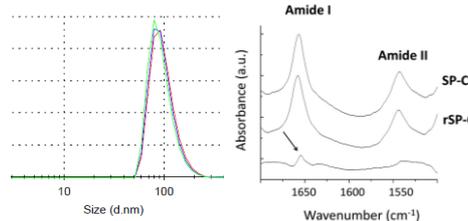
C.A.I.

Citometría y microscopía de fluorescencia



C.A.I.

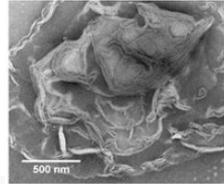
Espectroscopía y Correlación



E. coli

I.C.T.S.

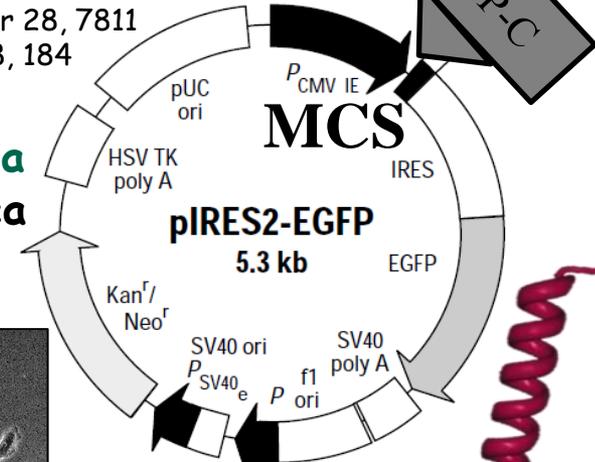
Centro Nacional de Microscopía



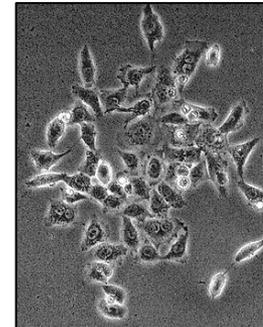
**Microscopía
C.I.B. - C.S.I.C.**

C.A.I.
Genómica y Proteómica
Secuenciación genómica

Lukovic et al., (2012) Langmuir 28, 7811
Roldan et al. (2015) BBA 1848, 184

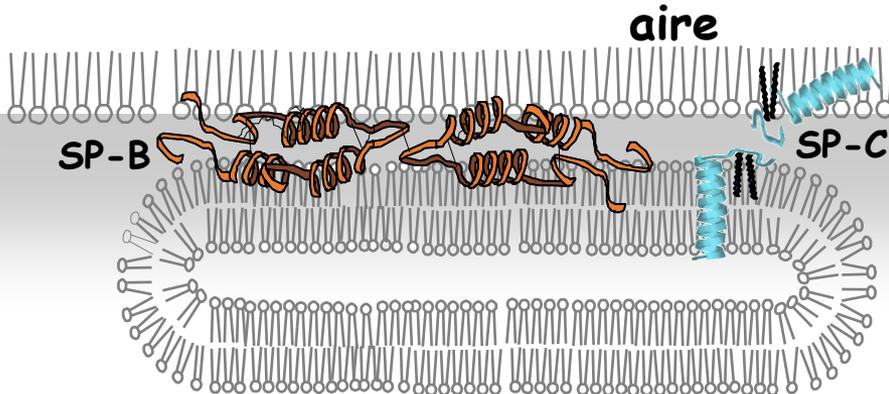
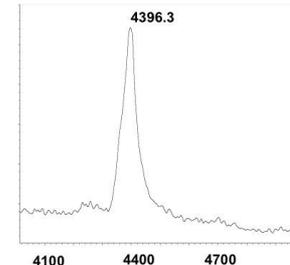


SP-C humana recombinante

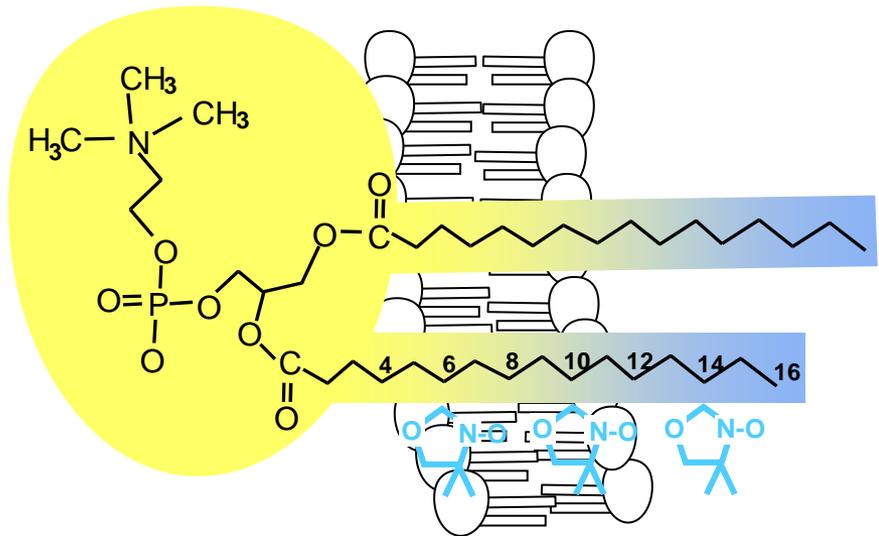


**Células HEK293
(riñón humano)**

**Espectrometría de masas
MALDI-TOF**



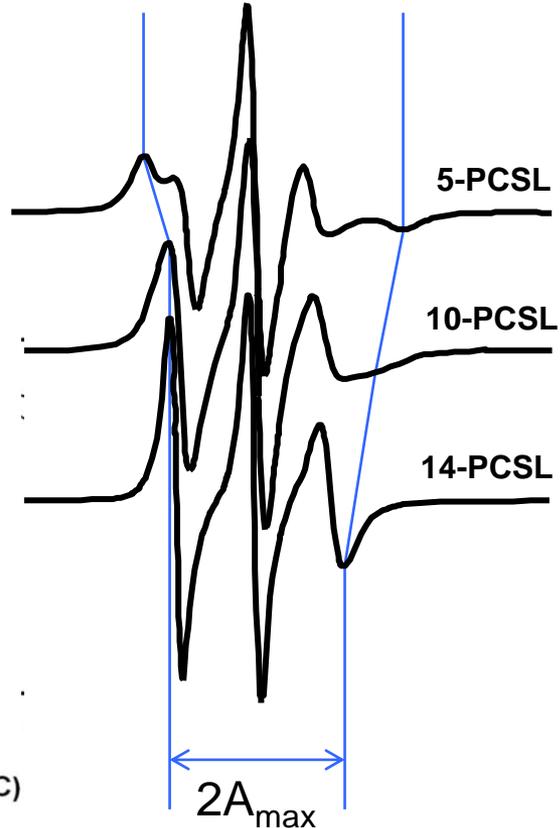
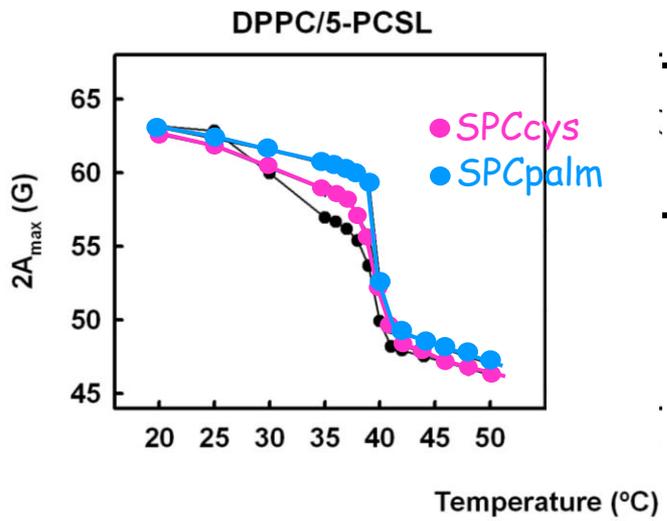
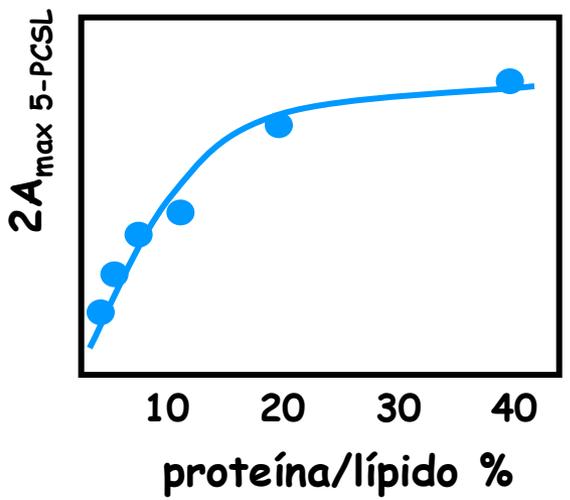
Efecto de las interacciones lípido-proteína en la movilidad y dinámica de los fosfolípidos



C.A.I.
Resonancia Magnética Nuclear y de Espín Electrónico

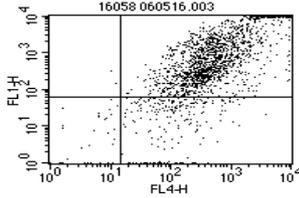
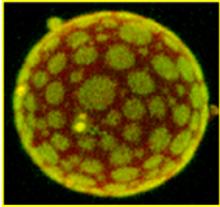
Resonancia de Espín Electrónico (ESR)

Plasencia et al., (2004) Biochem. J. 377, 183
 Plasencia et al. (2008) BBA 1778, 1274

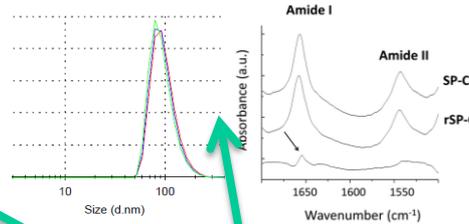


SURFACTANTE PULMONAR

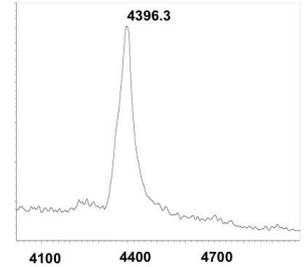
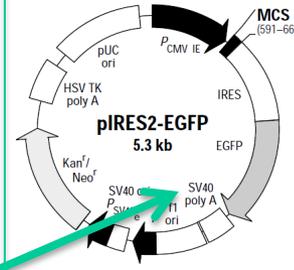
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Citometría y microscopía de fluorescencia



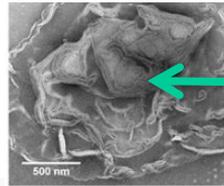
C.A.I.
Espectroscopía y Correlación



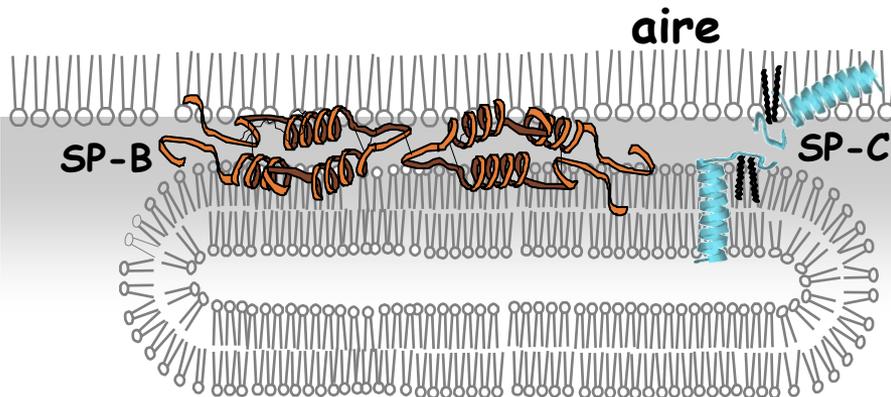
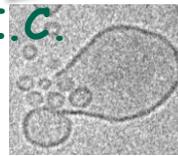
C.A.I.
Genómica y Proteómica



I.C.T.S.
Centro Nacional de Microscopía



Microscopía
C.I.B. - C.S.I.C.



C.A.I.
Resonancia Magnética Nuclear y de Espín Electrónico

