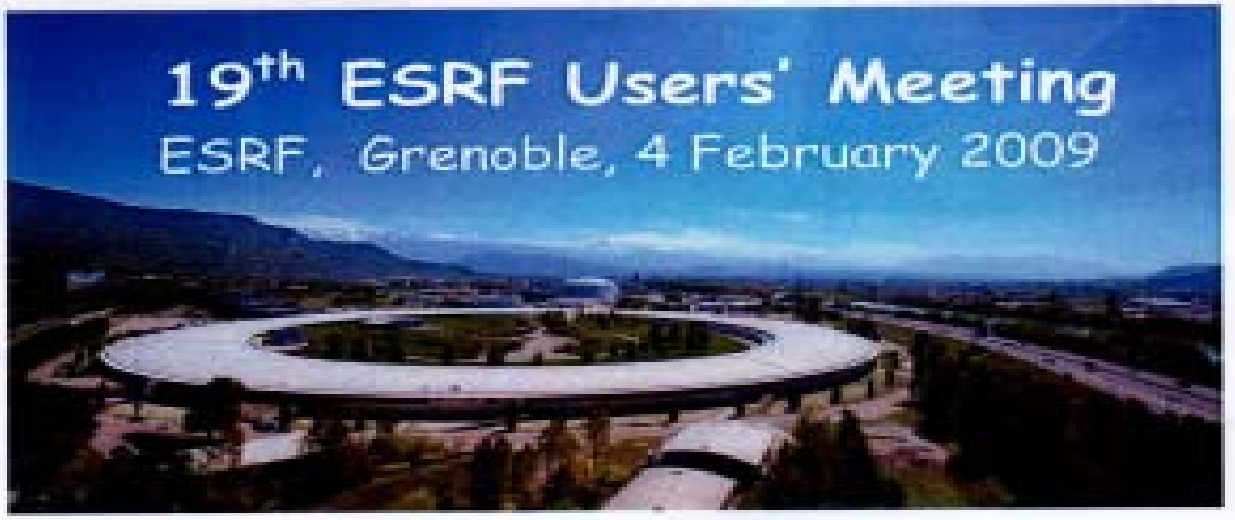

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- Parallel Discussion Groups
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European Synchrotron Radiation Facility (ESRF) – BP 220 – F-38043 Grenoble Cédex – France
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Users' Meeting 2009 Programme

Wednesday 4 February 2009
Morning Session, ESRF Auditorium

08.15	Registration starts
09.00 - 09.05	Opening and Welcome by the Directors and Users Organization
09.05 - 09.50	Keynote Lecture: "Science at High Pressure: Some new results and future challenges for synchrotron studies", Paul Loubeyre, CEA, DAM/DIF, Bruyères-le-Châtel, France
09.50 - 10.10	"A Renewal Plan for the Advanced Photon Source", Dennis M. Mills, Argonne National Laboratory, USA
10.10 - 10.40	~ *COFFEE BREAK* ~
10.40 - 11.30	ESRF Directors Report - Current Status and Upgrade Programme
11.30 - 12.00	Young Scientist Award Talk

Wednesday 4 February 2009
Afternoon Session

14.00 - 16.00	Parallel Sessions and Associated Workshops
16.15 - 16.45	~ *COFFEE BREAK* ~
16.45 - 18.30	Associated Workshops
18.30 - 19.50	Cocktail and Joint Poster Session
20.00 - 22.30	Dinner - Young Scientist and Best Poster awards ***(Transport will be organized at 22.30 hours from ESRF to central Grenoble)***

END

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INSTALLATION EUROPÉENNE DE RAYONNEMENT SYNCHROTRON

ESRF

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Grenoble, 27 February 2009

CERTIFICATE

To Whom it may concern,

This is to certify that **Dr Mercedes COCERA**, from BM16 CRG Beamline at the ESRF, Grenoble, France, participated in the **ESRF Users' Meeting 2009 & SDSSI Workshop**, held at the ESRF in Grenoble, France, from 3rd to 5th February 2009.

Sincerely,

ESRF User Office

Abstracts of Posters
(alphabetical order)

Interaction Skin-Vehicules

M. Cócera[a], G. Rodríguez[b], L. Barbosa-Barros[b], F. Fauth[c],
A. Labrador[c], A. de la Maza[b], O. López[b]

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The stratum corneum (SC) is the outermost layer of the mammalian skin. It consists in the corneocytes (flat and dead cells filled with keratin filaments) embebed into a lipid matrix (mainly ceramides, cholesterol, fatty acids, cholesterol esters, cholesterol sulfate) structured in lamellae. The specific composition and structure of the tissue confers the barrier function of the skin to the SC[1].

Bicelles are discoidal structures formed by phospholipids of different length chain. These disk-like shape structures are small objects that mimic the bilayer environment[2]. Previous *in vivo* experiments consisting in the application of bicelles onto the skin showed that bicelles modified some biophysical properties of the skin, such as the elasticity and the transepidermical water loss[2]. The bicelle-skin interaction induced some structural changes in the tissue that it was necessary understand for designing better and more efficient topical delivery systems. In this sense, bicelles could act as enhancers for altering the barrier function, allowing the pass of substances through or at the SC.

The experiment was carried out as follow: SC was removed from pig skin[3]. DMPC/DHPC or DPPC/DHPC bicelles were applied overnight. The tissue was mounting between two capton foils and measured at 24°C in BM16 beamline. The wavelength (λ) used was 0.9795 Å. Sample-to-detector distance for SAXS and WAXS was 1.5, and 0.35 m, respectively.

The results show that bicelles penetrate into the SC and modify the lipid phase. Changes could be related to the water contribution, but also to the lipid structure. Bicelles are able to alter the lipid organization, probably promoting changes in the lateral packing of the lipids. For all of these reasons, bicelles are very good candidates as topical drug delivery systems into or across the skin.

[1] *J.A. Bouwstra, Colloid Surf. A-Physicochem. Eng. Asp., 123 (1997) 403*
[2] *L. Barbosa-Barros et al., Int. J. Pharm.,352 (2008) 263*
[3] *O. López et al., Colloid Surf. A-Physicochem. Eng. Asp., 162 (2000) 123*

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19th ESRF Users' Meeting
ESRF, Grenoble, 4 February 2009

Poster 13

INTERACTIONS SKIN-VEHICLES

M. Cócera[a], G. Rodríguez[b], L. Barbosa-Barros[b], F. Fauth[c], A. Labrador[c], A. de la Maza[b], O. López[b]

[a]BM16, ESRF, 6 rue Jules Horowitz, BP-220, F-38043 GRENOBLE CEDEX / [c] Laboratori de Llum Sincrotró, BM16, ESRF
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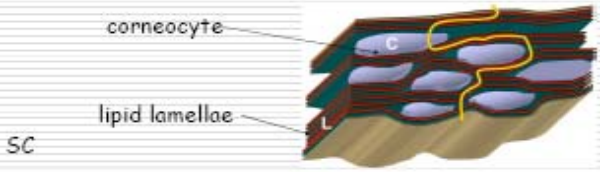
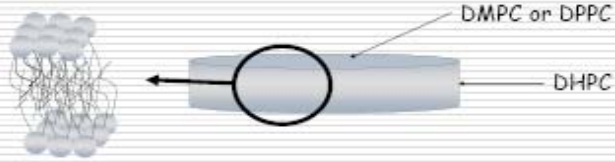
INTRODUCTION:

The **stratum corneum** (SC) is the outermost layer of the mammalian skin, with the corneocytes (flat and dead cells filled with keratin filaments) into the lipid matrix structured in lamellae[1].



Bicelles are small disks formed by phospholipids of different length chain[2].



DMPC/DHPC and DPPC/DHPC bicelles
q=DMPC/DHPC or DPPC/DHPC molar ratio

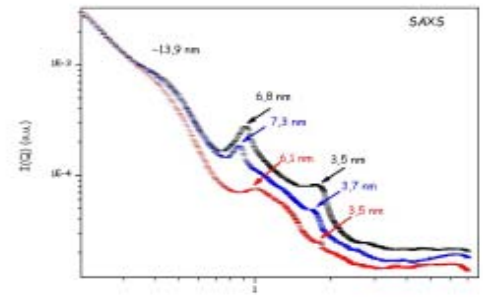
In vivo studies showed that topical application of bicelles changed biophysical properties of skin[2].

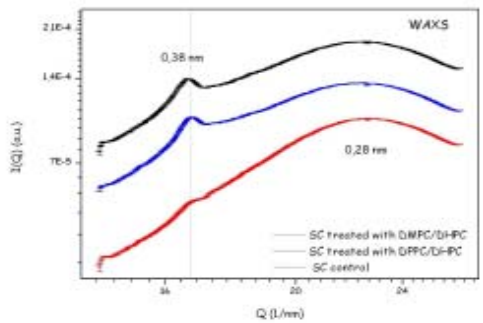
The **AIM** of this work is understand **how the bicelles interact with the SC: SAXS and WAXS study**

MATERIALS & METHODS:

- SC (removed from pig skin[3]) + bicelles
- DMPC/DHPC & DPPC/DHPC, q=2, 20% w/v lipid conc[2].
- SAXS (1.5m) & WAXS (0.35m) at **BM16** (ESRF), λ=0.9795 Å

RESULTS & DISCUSSION:





- bicelles modify lipid structure and organization of SC
- d-spacing for SC treated (6.8 and 7.3 nm) is higher, than for SC native (6.1 nm). Probably, water from bicelles produces the swelling of lipids
- the longer the lipid chain (DPPC), the longer the d-spacing
- shoulder around 13.9 nm could be compatible with the long spacing lamellar phase[1]
- peak corresponding to 0.38 nm distance is promoted in SC treated (WAXS results). Some authors described an orthorhombic lateral packing of lipids with this spacing[4]

REFERENCES:

[1] J.A. Bouwstra, Colloid Surf. A-Physicochem. Eng. Asp., 123 (1997) 403
[2] L. Barbosa-Barros et al., Int. J. Pharm.,352 (2008) 263
[3] O. López et al., Colloid Surf. A-Physicochem. Eng. Asp., 162 (2000) 123
[4] M.W. de Jager et al., J. Lipid Res., 46 (2005) 2649

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IN SUMMARY bicelles penetrate into the SC and modify the lipid phase. Changes could be related to the water contribution, but also to the lipid structure. Bicelles are able to alter the lipid organization, probably promoting changes in the lateral packing of the lipids. For all of these reasons, bicelles are very good candidates as topical drug delivery systems into or across the skin.

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