ISIS@MACH ITALIA

Science and Technology Facilities Council
ISIS Neutron and Muon Source

Experiment Proposal

Experiment number GP2022002

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Co-investigator (*)	Dr Giovanni Romanelli, University of Rome Tor Vergata, ITALY
Co-investigator	
Experiment title	Characterisation of artificial skin for application in skincare products using Confocal Raman Spectroscopy
SRF Instrument	**Confocal Microscopes**
Access Route	Rapid Access
Science Areas	Biology and Bio-materials
Sponsored Grant	None
Grant Title	-
Start Date	-
Similar Submission?	Unit CSGi-University Florence
Industrial Links	Arterra Bioscience S.p.A.

Days requested: 3
Previous GP Number: -
DOI: -
Sponsor: -
Grant Number: -
Finish Date: -

Non-Technical Abstract

In recent years, cosmetic delivery systems have played an important role for improving the penetration of active molecules and for their release in a controlled way. We propose a series of studies to investigate the permeation of dermal/transdermal delivery systems on synthetic and human skin samples - the penetration of drug molecules within skin, the intermolecular interactions amongst active ingredients, carriers and skin components. We propose to use two SRFs, i.e Horiba Xplora Nano (for Raman spectroscopy - Confocal Microscope) and Tescan Vega SEM-EDX (Scanning Probe Microscope), located at the Unit-University of Rome Tor Vergata, the MRF1-SAXS located at the Unit-CSGI & University of Florence, and the TOSCA spectrometer for inelastic neutron scattering (INS) at the ISIS Facility (RB 2220280 under FAP evaluation requesting 3 days of TOSCA beam time). In particular Horiba Xplora Nano instrument will be employed to study the in-depth diffusion of the active ingredients within the artificial skin samples. Regions of interest, previously defined on the same samples by SEM-EDX, will be scanned in the direction perpendicular to the sample surface tracking the vibrational modes fingerprinting the molecules of interest which were applied to the skin surface. The comparative analyses with the bulk spectra of the isolated components and the INS will provide new insight on the diffusion and penetration within skin, hydrogen vibrational dynamics and highlight the effects of intermolecular interactions. The results will be used to optimise the preparation strategies of healthcare products.

Publications -

Instruments	
Access Route	
Science Areas	
Sponsored Grant	
Grant Title	
Start Date	
Similar Submission?	
Industrial Links	

Days Requested:
Previous RB Number:
DOI:
Sponsor:
Grant Number:
Finish Date:

Sample record sheet

Principal contact Dr Giovanni Romanelli, University of Rome Tor Vergata, ITALY
SRF Instrument **Confocal Microscopes** **Days Requested:** 3
Special requirements:

SAMPLE

Material	artificial Skin	-	-
Formula	Labeling performed using 13C6 Glucose	-	-
Forms	Solid		
Volume	0.5 cc		
Weight	0.5 g		
Container or substrate	-	-	-
Storage Requirements	-	-	-

SAMPLE ENVIROMENT

Temperature Range	300 - 300 K	-	-
Pressure Range	0.1 - 1000 mbar	-	-
Magnetic field range	0 - 0 T	-	-
Standard equipment	None	-	-
Special equipment	-	-	-

SAFETY

Prep lab needed	Yes	-	-
Sample Prep Hazards	-	-	-
Special equip. reqs	-	-	-
Sensitivity to air	No	-	-
Sensitivity to vapour	No	-	-
Experiment Hazards	-	-	-
Equipment Hazards	-	-	-
Biological hazards	-	-	-
Radioactive Hazards	-	-	-
Additional Hazards	-	-	-
Additional Details	-	-	-
Sample will be	Disposed by IS	-	-