EUROPEAN **S**YNCHROTRON **R**ADIATION **F**ACILITY

INSTALLATION EUROPEENNE DE RAYONNEMENT SYNCHROTRON

ESRF	**Experiment title:** **Structure of lipid-ganglioside floating bilayers.**	**Experiment number**: **SC-2922**
Beamline:	**Date of experiment**: from: 9-06-2010 to: 15-06-2010	**Date of report**:
Shifts: 18	**Local contact(s)**: Oleg Konovalov	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

*CANTU' Laura
*DEL FAVERO Elena
*RONDELLI Valeria Maria
*FRAGNETO Giovanna
*DAILLAT Jean

Report:

We studied supported asymmetric bilayers containing DPPC, cholesterol and gangliosides. Measurements were performed at room temperature (22.8°C) and at 60°C (above the lipid chains melting transition temperature). Samples were re-visited at room temperature after annealing.

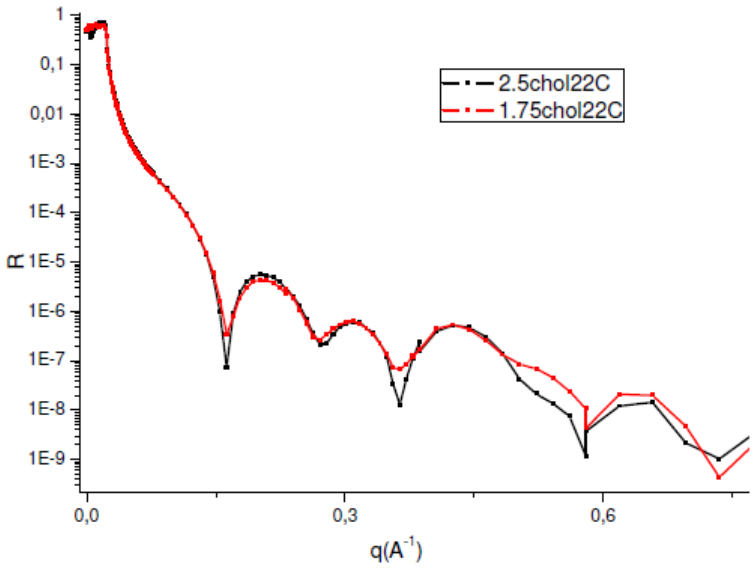
• supported bi-component bilayers with DPPC and Cholesterol in "physiological" mole fraction 11 : 2.5

• all of the cholesterol in the lower layer, pure DPPC upper layer ("bio-motivation": cholesterol is brought to the membrane from inside the cell)

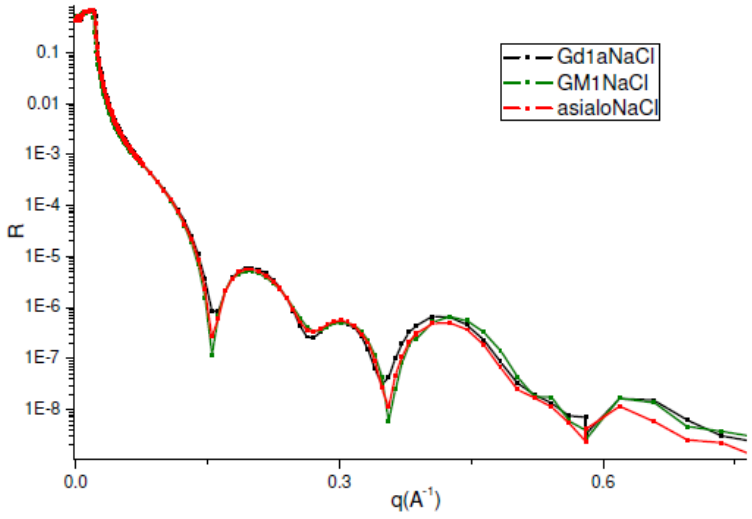
• 70 % Cholesterol in the lower layer, 30% in the upper layer (("bio-motivation": the final cholesterol mole fraction into the inner + outer leaflets of the membrane is roughly 70:30 with respect to other lipids)

Present result: none of these different cholesterol distributions seems to lead to spontaneous migration of cholesterol through the membrane. Some redistribution was seen after sample annealing, but the resulting structures didn't merge to a

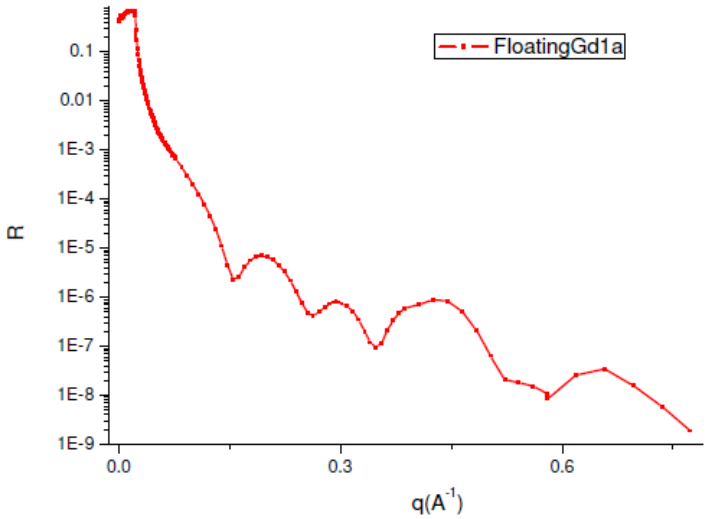
“final” one.



• supported ternary bilayers made of DPPC, cholesterol and gangliosides (molar ratio DPPC:Cholesterol 11:1.75 in the inner leaflet, DPPC:Cholesterol:Ganglioside 10:0.75:1 in the outer) in order to evaluate the structural dependence on ganglioside species and salt, carrying the measurements both in water and in physiological 156 mM NaCl.
We found different structures for membranes containing GD1a, GM1 and asialoGM1 gangliosides (bearing a different number of charged sugars). Differences were kept also at high ionic strength.



• Finally we performed a test measurement on a floating asymmetric bilayer containing GD1a, cholesterol and DPPC, supported by a DSPC bilayer adhering to the Si wafer.



Despite the sample complexity, the preparation procedure, the sample stability over the measurement time and the measurement itself were very satisfying.