How to get Neutron Beamtime:

Writing a Successful Neutron Proposal

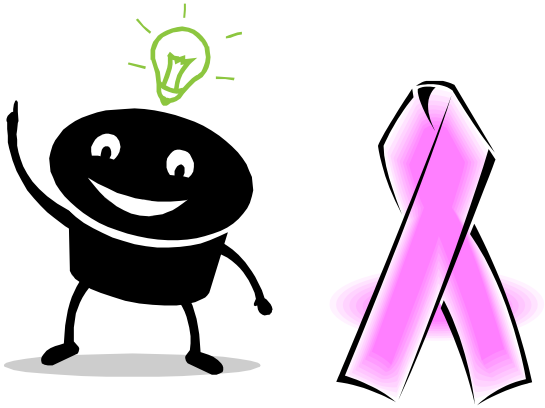
Victoria Garcia Sakai

ISIS Neutron and Muon Facility

Rutherford Appleton Lab, Didcot, UK

16th Oxford School on Neutron Scattering
6th September, 2019

Science & Technology Facilities Council
ISIS



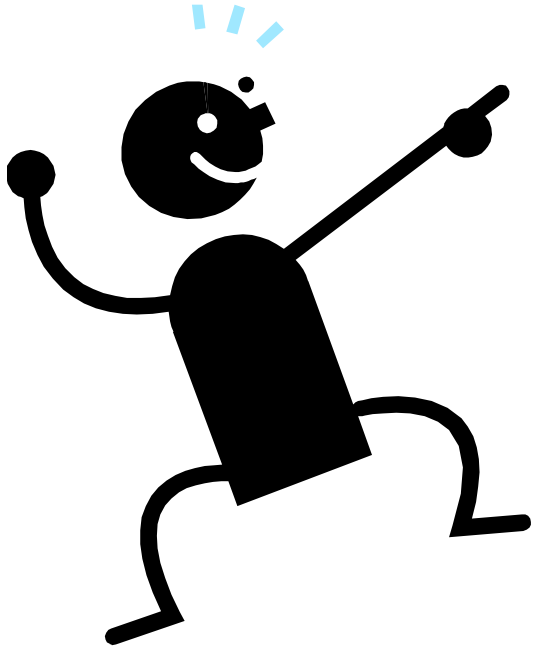
Idea & Research problem

sample

Pre- characterisation

the unique information obtained from neutron experiments

Can ~~neutrons~~ help me?



Are you sure?

Can you obtain the information with a different technique?

Are you completely sure?

When considering writing a proposal

- Literature review on similar experiments

When considering writing a proposal

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- Talk to colleagues

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- Literature review on similar experiments
- Talk to colleagues
- Research available instruments worldwide – ie. where should I go and get my neutrons?

Where should I go to get my neutrons?

- What instrument & facility is best suited to help my science case?
  - Instrument specs
  - Flux
  - Sample environment
  - Technical/user support
  - Laboratory space/facilities
  - PhD programmes
  - Software

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  - PhD programmes
  - Software
- Proximity/ease of access
- Funding
- Personal connections/collaborations
- Food/Scenery

Where should I go to get my neutrons?

Sources http://neutronsources.org/

Europe (25)

Americas (9)

Asia-Oceania (12)

Africa (1)

Sources with Major User Programmes

Europe

- Institut Laue Langevin – ILL (France)
- Heinz Maier-Leibnitz Zentrum – MLZ (Germany)
- Laboratoire Leon Brillouin – LLB (France)
- Helmholtz-Zentrum Berlin – HZB (Germany)
- Budapest Neutron Centre – BNC (Hungary)
- ISIS (UK)
- Swiss Spallation Neutron Source – SINQ (Switzerland)
- European Spallation Source – ESS (Sweden – under construction)

Americas

- NIST Centre for Neutron Research - NCNR (USA)
- High Flux Isotope Reactor – HFIR (USA)
- Canadian Neutron Beam Centre - CNBC (Canada)
- Spallation Neutron Source – SNS (USA)
- Los Alamos Neutron Science Centre - LANSCE (USA – reduced user programme)

Sources with Significant User Programmes

Asia - Oceania

- Japan Research Reactor 3 - JRR3 (Japan - awaiting permission to restart)
- Australia Nuclear Science and Technology Organisation – ANSTO, OPAL
- reactor (Australia)
- J-PARC Materials and Life Science Facility - MLF (Japan)
- China Spallation Neutron Source (CSNS – still limited instrumentation)
- High flux Advanced Neutron Application Reactor - HANARO (South Korea)
- Bombay Atomic Research Centre - BARC (India)
- South Africa Nuclear Energy Corporation – NECSA, Safari reactor (South Africa)
- China Advanced Research Reactor (CARR – not yet operational)
- China Mianyang Research Reactor(CMRR)

When considering writing a proposal

- Literature review on similar experiments
- Talk to colleagues
- Research available instruments worldwide
- Contact instrument scientist and ask questions!
    - *instrument configuration*
    - *sample environment*
    - *time required*
    - *…*

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    - *…*
- Decide on proposal type

Access Types

- **Normal proposal rounds** – twice per year
- **Rapid access (or Director's Discretionary time)** – for urgent studies or 'hot topics', submit at any time
- **Xpress access**, including postal service
- **Industrial access** (collaborative or for cash)
- **Back door** – collaboration/tests with institute scientists
- **Programme access** – long time proposals
- **Joint access with other facilities** – ask (eg. Diamond)

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    - *…*
- Decide on proposal type
- Make sure the samples have been characterised

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- Decide on proposal type
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- Can neutrons help me answer my questions

When considering writing a proposal

- Literature review on similar experiments
- Talk to colleagues
- Research available instruments worldwide
- Contact instrument scientist and ask questions!
    - *instrument configuration*
    - *sample environment*
    - *time required*
    - *…*
- Decide on proposal type
- Make sure the samples have been characterised
- Can neutrons help me answer my questions

the Proposal Process (in general)

- Two proposal calls per year
- Deadline is real!
- Technical Reviews (by facility scientists) – feasibility, safety…
- Peer Review by Scientific Experts
  - Classification is done by subject or technique
  - At least 2 reviewers per proposal
  - Panel meetings at facilities (or by Skype)
  - Time recommended
- Final balance (eg. national funding)
- Letters sent out to PI's

Things to keep in mind…

Scientific reviewers are not always experts in your specialty since science at the facilities is so diverse.

So, don't assume they know everything.

Most reviewers spend 10-15 minutes per proposal!

Many will not have time to read through the references!

So, you must get all relevant information in the proposal.

Make your point, clearly and succinctly.

Proposal Ingredients (Part I)

- User/participant information
- Title and abstract
- Sample description
- Sample environment requirements
- Instrument specs requested and time
- Publications, student thesis, scientific area, grants, submission status, safety…

JCNS, Munich

Proposal No. : 8744
Proposer :
Affiliation :
Short Name :

Subject

Title	

Title

Scientifique area	Soft Condensed Matter
Grand Challenges	Soft Matter, Macromolecules, Complex fluids
Instrument	KWS-1

Instrument

Continuation of experiment No.	7211
Resubmission of proposal nr.	

Rapid Access only available for instruments KWS-2, PGAA and SPODI.
Each accepted Rapid Access proposal will receive up to a maximum of 12 hours of beamtime.

Rapid Access Proposal?	No
Internal beam time	No
Did you submit this proposal also to another facility?	No
Measuring time [days]	1

Time

Abstract (max 200 words)

Abstract

Experimental team

Co-authors name, affiliation	
Local contact	

User info

Sample

Substance	deuterium oxide
Elemental formula	D2O
Sample type	liquid
sample size [mm] weight [mg]	1 (mm) thickness, 20 (g)
Number of samples	2
Availability of samples	2013-07-19
Space group	
unit cell parameters	

Sample info

Sample environment

No sample environment needed	Yes
Cryostat	
High temperature furnace	
Pressure cell	
Magnetic field	
other sample environment	shear cell (Anton Paar)
Temperature range	
Temperature stability	
Pressure range	
Magnetic field	

Sample environment info

Security aspects

Toxic	No
explosive	No
radioactive	No
Sample gets activated	No
activity after experiment [Bq / isotope]	
Other risks	

Miscellaneous

Sample preparation laboratory (neutron guide hall)	No
Typ of work, materials, equipment in use	
Special technical support	No
Details(e.g. own equipment, special configurations, mechanics, control, software)	

ISIS, UK

Science & Technology Facilities Council

ISIS

Experiment Proposal

Experiment Number: 920168

Principal investigator(*)	Dr V Garcia Sakai, STFC, United Kingdom	
Co-investigator		
Co-investigator		
Co-investigator		
Co-investigator		
Co-investigator		
Co-investigator		
Co-investigator		
Co-investigator		
Experiment Title		
Instrument	IRIS/ OSIRIS	Days Requested: 7
Access Route	Direct Access - Resubmission	Previous RB Number: -
Science Areas	Biology and Bio-materials	
Sponsored Grant	No	Sponsor: -
Grant Title	-	
Grant Number	-	
	Start Date: -	Finish Date: -
EU Access?		
Similar Submission?	No	

Abstract

Publications

User info

Title

Time & Instrument

Abstract

ISIS Sample record sheet

Principal contact	Dr V Garcia Sakai, Victoria.garcia-sakai@stfc.ac.uk, Tel: 00-44-1235-446703
Instrument	IRIS/ OSIRIS, 7 days, preferred contact is Garcia Sakai, V (Victoria.garcia-sakai@stfc.ac.uk)
Special requirements	-

SAMPLES

Material	protein
Formula	-
Forms	Solid
Volume	1 cc
Weight	-
Container / substrate	-
Storage requirements	-
Xtal details	

SAMPLE ENVIRONMENT

Equipment	CCR
Temperature range	10-330 K
Pressure range	-
Magnetic field range	-
Special equipment	-

SAFETY

Hazards	-
Hazard details	-
Sample sensitivity	-
Experimental hazards	-
Sample prep hazards	-
Equipment hazards	-
Prep lab needed	Yes
Special equip reqs	-
Sample will be	Removed By User

Sample info

Sample environment info

NCNR, USA

NIST Center for Neutron Research

Proposal for Neutron Beam Experiment

Submission ID:13104 Proposal Number: E23-19

Experiment Title

Title: Dynamics of phospholipid vesicles in the presence of bioprotectants

Title

Proposal Type: New Proposal

Time Received: 21-MAR-08 17:52

Scheduling

Desired Dates: 07-01-2008 to 12-31-2008

Impossible Dates:

Estimated Duration: 6 days

Time

Participants

User info

	Name	Address	Country	Telephone/e-mail
Principal Investigator	Garcia-Sakai, Victoria	Rutherford Appleton Laboratory ISIS Facility Chilton, Didcot Oxon, OX11 0QX	United Kingdom	000-000-0000 victoria.garcia-sakai@stfc.ac.uk
User 2	Nanda, Hirsh	National Institute of Standards and Technology NIST Center for Neutron Research 100 Bureau Drive, MS6102 Gaithersburg, MD 20899-6102	United States	hirsh.nanda@nist.gov

Instrument

Instrument Requested:	NG-5 -- NSE, Neutron spin echo spectrometer (CHRNS)
Suggested Local Contact:	Antonio Faraone
Instrument Resolution:	
Instrument Configuration:	Default instrument configuration

Instrument

Sample Description

	Sample 1
Name	DPPC/D2O/maltose
Chemical Formula	
Mass (grams)	
Form	Liquid

Sample info

Temperature Measurement Range (K)	300-330
Number of Runs	
Total Collection Time (hrs)	
Sample Availability	2008-03-01 00:00:00.0

	Sample 2
Name	DPPC/D2O/sucrose
Chemical Formula	
Mass (grams)	
Form	Liquid
Temperature Measurement Range (K)	300-330
Number of Runs	
Total Collection Time (hrs)	
Sample Availability	2008-03-01 00:00:00.0

Sample Environment

Sample environment info

Sample Environment Equipment:

Special Requirements

Please describe any non-routine needs for sample temperature, magnetic field, etc., or other ancillary equipment. Specify any equipment needed at NIST for sample loading, treatment, storage, etc. (inert atmosphere, refrigeration, dry box, etc.). Also describe any equipment you plan to bring to NIST.

Safety

Check *at least* one box that describes your sample

[X] No Hazards

[] Toxic [] Corrosive [] Radioactive [] Explosive [] Flammable

If there are any hazards associated with your proposed experiment, please indicate how any risks are to be handled.

Categorization

For reporting purposes, please categorize your proposal:

Research Area:	Biomolecular Science
Funding Agency:	NRC and STFC UK

Publications

Proposal Ingredients (Part II)

Two-page description of proposed research (incl. references)

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- Brief background, state the problem clearly and why the experiment is important, why it will make a difference – **Why should one care?**

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- Clear justification of need for neutrons and particular instrument- **why do you need beamtime on X?**

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- **Be clear and specific – not vague and general!**
- **Think of yourself as a reviewer! What would annoy you?**

2-page case including references and figures/tables

FRM II
Forschungs-Neutronenquelle
Heinz Maier-Leibnitz

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Lichtenbergstr. 1, 85748 Garching/ Germany
Tel.: +49.(0)89.10703/ 10794
Fax: +49.(0)89.10799
Email: userinfo@frm2.tum.de Web: user.frm2.tum.de

SUBMISSION OF A PROPOSAL

Experiment Title

Proposer

Name
Email
Affiliation
Co-Proposers

Scientific background and detailed description of the proposed experiment

Abstract (~100 words)

Introduction

Reference

[1] K. Sadakane, A. Onuki, K. Nishida, S. Koizumi, and H. Seto, *Phys. Rev. Lett.*, **103**, 167803 (2009). [2] A. Onuki, *J. Chem. Phys.*, **128**, 224704 (2008).

Previous results

FRM II
Forschungs-Neutronenquelle
Heinz Maier-Leibnitz

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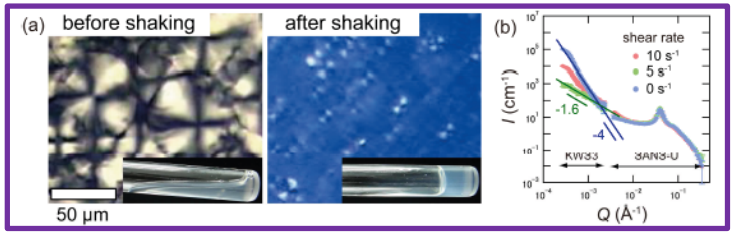

Aim of proposed work

Proposed experiments

Here is our experimental plan:

1) Instrument: KWS1 with rheo-meter (Anton Paar)
2) Shear-rate: 0 s^{-1}, 0.1 s^{-1}, 1 s^{-1}, 3 s^{-1}, 5 s^{-1}, 7 s^{-1}, 10 s^{-1}, 50 s^{-1}, 100 s^{-1}, 1000 s^{-1}
3) The measured spatial domain: Q = 0.003 $Å^{-1}$ to 0.3 $Å^{-1}$
4) Sample: (i) D_2O / 3-methylpydine / $NaBPh_4$
   (ii) D_2O / $C_{14}E_5$
5) Temperature: 298 K

We assume that one measurement takes 45 minutes (15 minutes at high-Q and 45 minutes at low-Q region).Then, the total measurement time is estimated as
0.75 (hours) × 10 (shear rate) × 2 (samples) × 1 (temperature) = 15 (hours).
Additionally, we need 8 hours for setting rheo-meter and changing the detector length.
Threfore, we request 1 days beam-time.

Your publication record (give references to papers published in the last two years arising from experiments at FRM II instruments)

There is no paper arising from experiments at FRM II instruments.

2-page case including references and figures/tables

Changes in lipid dynamics induced by melittin absorption on membrane surfaces

The rise of infectious bacterial strains resistant to current antibiotic treatments is a growing concern universally. This has spurred an intensified interest both in the discovery and understanding of naturally occurring anti-microbial agents and the molecular mechanism by which they function. Most anti-microbial compounds associate with the cellular membrane and disrupt the delicate electro-chemical balance required for bacterial cellular life. One such naturally occurring molecule is melittin (MLT), found in the venom of honeybees. MLT posses many characteristics shared among known anti-microbial peptides. It is a single domain a-helix with a strong amphipathic quality (Fig. 1a). Structural studies from X-ray diffraction experiments [1] show partitioning into the lipid membrane of cells - intercalating with the headgroup region (Fig. 1b). Significant perturbations to the lipid chains are also observed: a thinning of the hydrocarbon region as well as a broadening of the terminal methyl distribution suggest an increase in chain disorder due to MLTs presence. At higher concentrations, MLT fully penetrates the membrane as self-assembled helical bundles that form large pores in the membrane, leading to cell death.

Detailed structural data from diffraction experiments has helped elucidate the function of MLT. However the mechanism for biological activity stems from the dynamics. We propose to use quasielastic neutron scattering (QENS) to characterize the changes in mobility of a model dioleoylphosphatidylcholine (DOPC) phospholipid membrane, in the presence of MLT. The protein:lipid system will be divided into three major components, the phospholipid headgroups, the lipid hydrocarbon tails and the MLT itself. Selective deuteration will allow us to follow the mobility of each of the three components separately. Regions of lipid that interact with MLT the most will be identified by comparison of dynamical changes with the pure DOPC bilayer measurements. Furthermore a study combining molecular dynamic (MD) simulations with neutron results on a similar system [2] suggests that regulating the mobility of phospholipid headgroups controls melting transitions. Measuring the effect on the membrane Tm provides another method for probing the balance between headgroup and chain interactions with MLT.

Previous QENS measurements of ordered lipid systems have used a combination of several dynamic models to describe motions in the ps to ns range of accessible time scales [1,3-4]. Given the sub ns dynamic range of the IRIS backscattering instrument our experiments will primarily be sensitive to methyl rotations, dihedral isomerization and localized diffusion (Fig. 2a). Despite the use of selective deuteration, the dynamical processes are still complex and may prove difficult to dissect into their individual contributions. Therefore, we will use an experimentally validated MD simulation [5] to provide a powerful method for aiding in the interpretation of QENS data, since there is total overlap in time and length scales accessed by both methods. Preliminary analysis of a DOPC/MLT simulation already provides some insights into potential perturbation in lipid dynamics caused by the peptide. Fig. 2b shows a snapshot of the simulation in which lipids within the vicinity of the protein are either highly kinked or extended. Furthermore the less mobile headgroups adjust their packing behavior around MLT. The results already suggest a possible framework for interpreting QENS data for this system.

We propose to perform experiments on the following samples:

(1) Fully hydrogenated DOPC [hh-DOPC]
(2) Fully hydrogenated DOPC with melittin [hh-DOPC+h-melittin]
(3) Hydrogenated head-group DOPC [hd-DOPC]
(4) Hydrogenated head-group DOPC with melittin [hd-DOPC+h-melittin]

The experiments proposed are presented in turn below:

(a) Elastic window scans (10-350K): elastic scans will give us a number of preliminary results. A comparison of the scans of the non-labeled lipid with and without MLT (samples 1,2), will show changes in Tm and in the dynamic regimes within the timescale of the IRIS spectrometer. Comparing head labeled with fully hydrogenated (signal dominated by tail protons) DOPC will indicate if the gel-to-fluid transition is characteristic to a specific part of the lipid (samples 1,3). Addition of the MLT to the labeled DOPC will show any differences in mobility in the presence of MLT that are specific to the individual components of the lipid (samples 2,4). Finally, mean-square displacement data for all samples will reveal changes in the mobility of all three components in the system (all samples). Elastic scans will require 3 days.

(b) Dynamic runs: we propose to measure the dynamics of each of samples 3-6 at two temperatures, below and above Tm. The measurements will allow analysis of the mobility of the DOPC head and tail groups quantitatively (samples 1,3), allowing for precise assessment of their response to the addition of MLT (samples 2,4). These experiments require 4 days (assuming 12hr per temperature run based on sample quantities).

The samples will consist of multilayers of DOPC and DOPC/MLT mixtures containing 1.5 mol % MLT per mol DOPC, plated onto a series of silicon wafers. Around 15 wafers are stacked in an aluminium slab-shaped cell with the face area of the same dimensions as the neutron beam. Such a cell has already been used for experiments on the backscattering spectrometer at the NIST Center for Neutron Research. The cell is contained in a humidity chamber and the samples are kept at 66 % r.h. with a NaNO2 solution in D2O. Use of D2O allows minimization of incoherent scattering from the buffer and also from the exchangeable protons in the MLT. The concentration of MLT and the humidity is chosen to match the MD simulations and diffraction experiments.

We propose to use the IRIS spectrometer with the PG002 configuration at a resolution of 8.8 ueV (HWHM) and an energy range of 1.0 meV, giving us access to timescales between ca. 0.5-100 ps. The Q-range accessible is 0.3- 1.8 inv. Ang. These distances and times are directly comparable to the MD simulations. For the completion of the proposed work we are requesting a total of 7 days.

We note that this is a resubmission of RB 0720585 which was awarded 7days. Since then we have been trying to synthesize MLT and encountered some difficulties, thus we have not used our beamtime and we thought it would be better to resubmit. We now have a successful route for expressing MLT and will be ready to perform the experiment.

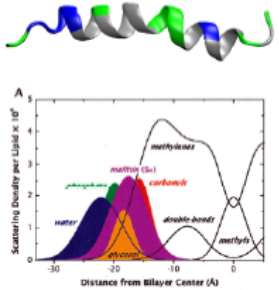

Figure 1: (a) The amphipathic MLT monomer is shown with polar residues in green, basic residues in blue and non-polar residues in grey. b) X-ray scattering length density profiles show MLT partitioning into the lipid headgroup region of a dioleoylphosphatidylcholine (DOPC) bilayer [1].

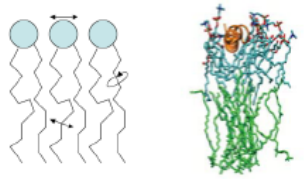

Figure 2: (a) A schematic of accessible motions on the sub ns time scale. Straight arrows represent localized mobility and circular arrows represent dihedral isomerization or terminal methyl rotation. (b) Snapshot of a DOPC/MLT MD simulation. Perturbation to lipid tail conformation and packing defects in lipid headgroups are evident.

References:

[1] K. Hristova et al, *Biophysical J.* **80** 801 (2001).
[2] M. Doxastakis et al, *Biophysical J.* **92** 147 (2007).
[3] S. König et al, *J. Phys II France* **2** 1589 (1992).
[4] S. König et al, *Biophysical J.* **68** 1871 (1995).
[5] R. W. Benz et al, *Biophysical J.* **91** 3617 (2006).

Do's and Don't's'

- ✓ Use all space allocated
- ✓ Add readable figures/graphs
- ✓ Justify need for neutrons
- ✓ Add references
- ✓ Check before submission

- ✗ Use miniture font
- ✗ Include if they do not add to proposal
- ✗ Use generic arguments
- ✗ Expect reviewer to read
- ✗ Make silly mistakes

Proposal Submission

- Online
- Read guidelines for given facility system
- Follow instructions carefully
- Meet the deadline (don't play tricks!)

INSTITUT MAX VON LAUE - PAUL LANGEVIN (ILL)

Guidelines for the scientific background and detailed description of the proposed experiment

(For electronic proposal submission only)

Please remove this first page before creating your post-script file

The two pages of this form are to be filled in by all users or groups of users who apply for beamtime for experiments at the ILL via the Internet. Please print pages two and three of this document into a postscript file and attach it to your proposal on the **E**lectronic **P**roposal **S**ystem. This two-page description will be reduced by the system to a one-page, A4 format in black & white, and will be attached to your web proposal.

When preparing your description, please follow the instructions below:

- *Give a brief statement of the **background** and the general importance of the research.*
- *Give a clear account of the **aims of the proposed experiment** and a detailed description of the experiment; keep in mind that not all of the subcommittee members are experts in the field.*

Proposal Review Process

- Panel review
  - By technique or by science area
  - At least 2 reviewers per proposal
  - Panel review meeting at the facility

@ the ILL (France)

College 1	Applied materials science, instrumentation and techniques
College 2	Theory
College 3	Nuclear and Particle Physics
College 4	Magnetic Excitations
College 5	Crystallography
College 6	Magnetism
College 7	Structure and dynamics of liquids and solids
College 8	Structure and dynamics of biological systems
College 9	Structure and dynamics of soft-condensed matter

@ the SNS-HFIR (USA)

Subcommittee 1	Engineering and Materials
Subcommittee 2	Imaging
Subcommittee 3	Triple Axis
Subcommittee 4	Time of flight
Subcommittee 5	Low Q reflectometry
Subcommittee 6	Low Q SANS
Subcommittee 7	Single crystal diffraction
Subcommittee 8	Powder diffraction
Subcommittee 9	Disordered Materials
Subcommittee 10	Low Energy/Chemical Spectroscopy

Proposal Review Process

- Proposal is given a rating (e.g. 1 to 5 in steps of 0.5)
- Typical marking definitions (NCNR, NIST)

5 = E = Excellent proposal. Experiment must be carried out. Highest priority for beamtime.

4 = VG = Very good proposal. Experiment is highly deserving of beamtime. No reason to deny beamtime except under conditions of unusually high demand.

3 = G = Good proposal. May receive beamtime under normal circumstances, but may not, depending on demand.

2 = F = Fair proposal. While scientific merit does not appear to be exceptionally high, the experiment may receive beamtime if its is available, but will probably not receive time

1 = P = Poor proposal. Scientific merit not convincingly docmented. Beamtime should not be allocated to the proposal.

Examples of Reviewers Comments

Rating: **Excellent**
Comments: This is a very well described proposal, system is well pre-characterised. The use of neutrons is justified to look at the Q-dependence and discern the origins of the changes induced by confinement in a strongly H-bonded system. There is clear justification about the need to perform a concentration dependence study and compare with their previous studies on QENS on the bulk samples.

Rating: **Very Good**
Comments: The importance of understanding the effect of nanoparticles in polymer nanocomposites is clear for a number of applications. This proposal aims to differentiate between the roles of chemi- and physi-sorption in the dynamics of the polymer. Polymer A is the chosen polymer whose dynamics in the melt clearly falls within the NSE window based on their earlier measurements. The authors mention two ways of differentiating this: with temperature and by replacing the –OH terminal groups by -CH3s. It seems to me that the latter would provide a much more cleaner difference, and hence there is no need to do the different temperatures. This would also reduce their beamtime to around 10 days rather than 15. All in all I believe this proposal is well thought out and presented, very systematic and the data will be analyzed in terms of well-established models.

Rating: **Average**
Comments: The scientific context of the proposal is nicely set out and the main aim of the experiment as well. I recognise the difficulty of perdeuterating the protein as well as the substrate, but it is unclear why the choice of 6 samples. For example, why do the authors need to measure samples (3) and (6) – it is not clear to me what additional information they will learn. In particular I think that it will be hard to separate out the dynamics of the two individual components in sample (6), given that there will be two collective responses. For samples (4) and (5) it would have been helpful to have added what the relevant incoherent scattering contributions are. In addition, the authors point out that samples (2-4) and (6) will be measured only at one temperature of 300K and samples (1) to (5) at many. This needs to be explained.

Examples of Reviewers Comments

Rating: **Poor**
Comments: I'm afraid that I found this proposal very hard to review: it was difficult to read and understand it, the scientific case was not properly justified, I couldn't understand why this was not a 'continuation' proposal since the authors have already measured two crystallinities before - assuming that this is what they are asking to do in this current proposal, the reason for multi Ei was not justified. From a more scientific point of view, the previous data has not really been explained except to say that at higher crystallinity there is stronger phonon intensity. I can see how there seems to be a change in the Boson to QENS at around 230K but I don't understand that "this suggests that the transition of side chains might be below 230K." Finally I would suggest that if you want to look at the QENS of the side chains below 230K you try a higher resolution machine so you can move away from the Boson peak intensity - try DNA at J-PARC. All in all I think that although the experiment is do-able it is not clear what the authors want to learn and how they will elucidate this.

Rating: **Poor**
Comments: This proposal makes very little experimental sense. 1) they propose to do elastic scans on a chopper machine. This is the wrong instrument in my opinion. 2) A clear plagiarism and non-referencing from Mr Y's original work refers to the wrong spectrometer for performing the measurement! They do not even know how the instrument works, never mind being capable of analyzing the data after even if they get help from the local scientists. I have no confidence in this group being able to successfully use this time if allocated.

Success …

… depends on many factors:

- Quality of proposal
- Days available
- Oversubscription
- Committee's feeling about high risk-high reward proposal versus unexciting but definite publication
- Mood, tiredness…
- Country balances
- …

Any questions?!

Victoria Garcia Sakai
JSIS

Neutron Proposal Exercise 1

- You will be given a proposal and asked to review it
- One of you will be the ‘Rapporteur’, others reviewers
- Rate as

  1 – poor

  2 – average

  3 – good

  4 - excellent
- Give some justifications for your score
- Consider whether it should be awarded beamtime

Pair No.	Student A	Student B	
1*	**Maria Kariuki**	**Pallavi Kumari**	NG1-Refl
2	Andreea Nadaban	Gaia Urciuolli	NG1-Refl
3	Sara Zandomeneghi	Lei Zhang	NG1-Refl
4	David Noirat	Chloe Skingle	NG1-Refl
5*	**Wafaa Al-Shatty**	**Adriana Mamede**	NG5-NSE
6	Ines Pereira dos Santos	Yitian Xiao	NG5-NSE
7	Zi Wang	Vitalli Kuznetsov	NG5-NSE
8	Jose Martinez Gonzalez	Lisa Morrison	NG5-NSE
9*	**Elizabeth Driscoll**	**Pierre Ghesquiere**	INES 1
10	Vincent Deguin	Farheen Sayed	INES 1
11	Iuliia Mikulska	Ainara Valverde	INES 1
12	Rita Mendes da Silva	Khalid Alharbi	INES 1
13	Bernet Meijer	Pala Ravishankar	INES 1
14	Mario Falsaperna	Pooja Jain	INES 1
15	Nazir Khan	Sagar Ghorai	INES 1
16*	**Aly Abdeldaim**	**Alex Petsch**	INES 2
17	Mahima Kurian	Hesameddin Mohammadi	INES 2
18	Charlotte Pughe	Sercan Arslan	INES 2
19*	Seda Ulusoy	Varathan Anusree	ENGIN-X 1
20	Peter Mills	Quanzheng Tao	ENGIN-X 1
21	Rebecca Randle	Zoe Jones	ENGIN-X 1
22*	**Matea Ban**	**Weiyao Li**	ENGIN-X 2
23	Marc Moret	Robert House	ENGIN-X 2
24	Nicola Precisvalle	Aneeqa Khan	ENGIN-X 2
25*	**Julius Mutschler**	**Anupam Singh**	NG4-DCS
26	Xi Zhao	Wenjie Wan	NG4-DCS
27	Vera Bader	Artem Malyeyev	NG4-DCS
28	Fengqi Zhang	Johny Bulled	NG4-DCS
29	Katherine Tustain	Sobhanan Roshna	NG4-DCS

Experiment title: The Placement of Saccharides in Lipid Bilayers
PI Surname: Garcia Sakai Instrument: NG1 REFL

Scientific Reviews

Reviewer1 Rating: F-P
The scientific case for this proposal is very interesting. It is an important issue in biology the understanding of the mechanisms b... ...gars stabilize membranes. Users propose to look at the insertion of Sugar X in planar adsorbed single bilayers. the feasibility of the experiment is not clear. A... ...imulation shown in figure 2, the region where differences appear in the system with h- and d- sugar has very low reflectivity and differences are likely t... ...ithin the experimental error bars. It would have been useful to show the comparison with the bilayer alone but I suspect that the curve is very similar ... ...icult to determine. Maybe other partially labelled systems could help.

Reviewer2 Rating: F
This proposal is an excellent idea but it only rates a fair use of neutron time because backgro... ...The creation of lipid layers is not trivial and the exposure of them to sugars could have unexpected consequences.

Reviewer3 Rating: G-F
The introduction of sugars into lipid bilayers is an interesting fundamental... ...d by the available literature on the subject. The lipid system the team have chosen has been widely studied as ... ...which has lead a large number of publications. However, the approach the team have chosen with only using h... ...ively between the two models that have been proposed. The difference in the calculated reflectivities of t... ...a contrast variations will be key to disentangle the morphologies unambiguously. This will be true especi... ...mething like a mixed mode occurs.

Reviewer4 Rating: E
The aim of this proposal is to investiga... ...bilayer, in order to gain insight into how the sugar interaction alters the phase behavior and structure of the lipid... ...anism of cryopreservation. Neutron Reflectivity experiments will enable the authors to distinguish between the two... ...l and biological significance in the area of biopreservation of membranes, and NR may be the best way to addres... ...ting calculations of the expected reflectivity profiles) and should have a high success rate, and the proposal is wel...

Reviewer5 Rating:
In my view this is an ... ...pacts in the field of small molecules (sugars)-membrane interactions. Understanding the location of sugars in the model lipid membrane... ...n scattering (small angle or reflectometry) and wisely chosen contrast conditions. Access to the deuterated sugar would be of biggest importanc... ...is well described and supporting calculations are already executed.

Comments: Should have s... ...y for bare bilayer compared to bilayer with sugar. It is not clear what measurement sensitivity is required. Need to demonstrate feasibility.

Technical Review
Days Recommended: 6
Technically feasible.

Final Decision
Days Requested: 5.0
Days Alloc.: 4.0

Experiment title: Dynamics of phospholipid vesicles in the presence of bioprotectants
PI Surname: Garcia Sakai Instrument: NG5 NSE

Scientific Reviews

Reviewer1 Rating: G-F

This is a nice proposal with real biophysical relevance. Nevertheless it seems to me that addressing a dynamical issue wi[th]o exact information related to the detailed structure of the system is adventurous. A NSE experiement is therefore in my view still premature. The auth[ors] apply on SANS machines to first elucidate how the sugar interacts with the vesicles: few contrast matching experiment should reveal if the sugar[...]an be described as a core-shell object or is a biphasic system etc etc . When structural data will be available, the author will have a very st[rong] strongly encouraged to apply again for NSE at that time.

Reviewer2 Rating: G

General problem of sugar bioprotecting effect which is not clearly understood. The au[thors] presence of sugar X molecules and they want to extend to sugar Y and sugar Z. I don't understand ho[w] ween the 3 hypothesis.

Reviewer3 Rating: VG

The proposer wishes to understand the characteristic interactions [...] haring, otherwise, the same chemical formula) via investigating the membrane fluctuations in the p[resence] The study of the interaction of sugars with biomembranes is of interest due to the important biologi[cal] y. The experiment may very well justify the use of the spin-echo technique, although the use of the Zi[...] nable. In any case, differences on the relaxation rats between membranes carrying the different su[gars] sugar-lipid membrane interaction.

Reviewer4 Rating: VG

The modification of the bendin[g] data on sugar X. The experiment seems to be promising in terms of interesting results since a[...]

Technical Review

Days Recommended:

The proposer has mea[sured] nt is feasible. The estimation of the beam time in the description is 7 days although their requested number of days is 6. The[y] complete the proposed experiment.

Final decision

Days Requested: 6.0
Days Alloc.: 0.0
Comments: The BTAC regrets [th]at the very high demand for NSE makes allocation of beam time for this proposal impossible.

REJECTED

Experiment title: A wide-range energy and wave-vector transfer instrument for pulsed sources

PI Surname: Experimenter Instrument: ISIS INES

Technical Review
Days Recommended: 2
Experiment is feasible.

Final decision by PANEL
Days Requested: 2.0
Days Alloc.: 2.0

Experiment title: Compositional and microstructural analysis of iron meteorites through TOF neutron diffraction

PI Surname: Experimenter Instrument: ISIS INES

Technical Review
Days Recommended: 4
Experiment is feasible.

Final decision by PANEL
Days Requested: 4.0
Days Alloc.: 4.0

Experiment title: Residual stress mapping in Compact Tension (CT) test specimens with strain misfit remote from crack tip

PI Surname: Experimenter Instrument: ISIS ENGINX

Scientific Review
Rating Poor
Comments: The panel found elements of this proposal rather puzzling. It was not clear why the proposed method was the most straightforward for introducing a different residual stress field rather than say, simply ch… he geometry of the sample. Also, it was felt that the finite element model calculations should h… d presented alongw ith the proposal. Some issues of feasibility were al… al axes under load would require a vertical loading axi… e of the 0.5mm collimators would likely lead … e issues identified above are addressed, in pa… why the proposed experiment is the best deig…

REJECTED

Final decision by PANEL
Days Requested: 3.0
Days Alloc.: 0

Experiment title: Residual stress mapping in Compact Tension (CT) test specimens with strain misfit remote from crack tip

PI Surname: Experimenter Instrument: ISIS ENGINX

Scientific Review
Rating Very Good
Comments:
Interesting proposal with s… sed in t he original submission

ALLOCATED

Final decision by PANEL
Days Requested: 3.0
Days Alloc.: 3. 0

Experiment title: Spin-wave study of a new pyrochlore Heisenberg antiferromagnet
PI Surname: Stewart Instrument: NG-4 -- DCS, Disk-chopper time-of-flight spectrometer

Reviewer: Reviewer 1
Rating: VG (Very Good)
It is proposed to study the spin excitation spectrum of the new pyrochlore material Gd2Pt2O7. The syste[m] [s]mall differences from other Gd pyrochlores and the question of the role of exchange pathways involving Pt is well formed. Experi[ments] [pro]ds are highly challenging on account of the exceptionally high absorption of Gd. They have for this reason fabricated samp[les] [in] this produces only a small amount of sample. They claim to have had success with a similar amount of material bu[t] [wh]s no support is given and the paper is in preparation. The experiment is worthwhile pending instrument time.

Reviewer: Reviewer 2
Rating: VG (Very Good)
The powder-averaged spin wave dispersion will be obtained i[n] [a] [py]rochlore. Previous studies indicate that second and/or third-neighbor interactions may be relev[ant] [and] data to be obtained in DCS will be essential to obtain such constants with the necessary accur[acy] [I] [re]commend. I believe that the proposed experiment is interesting and the results will be relevant t[o]

Reviewer: Reviewer 3
Rating: VG-G
The proposal is well [w]ritten. [T]his class of materials, gadolinium-pyrochlore compounds and inelastic measurements of simi[lar] [ex]periment should provide more information to obtain J values and compare them with other materials in this c[lass] [of] [sa]mple mass reported is sufficient for a successful experiment.

Technical Review
Reviewer: Reviewer 4
Instrument Requested: NG-4 [--] [D]isk-chopper time-of-flight spectrometer
Days Requested: 4.0
Days Recommended: 4
Comments: Powder in helium-3 fridge. Composition has been measured on DCS before. Feasible.
BTAC Review
Days Alloc.: 0.0
Comments: The BTAC regrets that no time can be recommended to the proposed experiment, due to high demand for DCS.

REJECTED

Neutron Proposal Exercise 2

- In pairs/triplets
- Use proposal template (1 per group)
- To be filled in with pen/pencil, no printers
- One experiment creatively made from contributions from all team members

- **Deadline is 5pm on Wednesday 11th**

- Panel meeting will take place starting at 2pm on Thursday 12th in the Dennis Sciama Lecture Theatre