

Main Achievements from the JSPS sponsored short-term fellowship

RIKEN Harima Campus (12th to 22nd February and 26th to 27th February 2012)

The visit to Japan took place when the world's second X-ray laser facility, SACLA, was in its commissioning phase at the Harima Campus of RIKEN. This was an exciting time full of pioneering spirit when experienced groups were invited to perform some 'proof-of-principle' experiments (see [Annex 1](#), a report I wrote for the Journal of Synchrotron Radiation). The feeling was similar to what I experienced 38 years ago when Synchrotron Radiation research was in its infancy.

Photo: Groups from Max Planck, Germany and Liverpool with collaborators from RIKEN at SACLA during the commissioning period.



I closely interacted with several groups at the Harima RIKEN including those involved in the operation, construction and utilization of SACLA as well as the Structural Biology community at the Harima campus and some of the investigators from Hyogo University.

During my stay at Harima, I was able to look at the data of 'proof-of-principle' experiment of Gas Phase Scattering done at SPring-8 by our (mine & Prof Ishikawa) PhD student who is based at Harima since April 2011 and will be there till April 2013. The analysis led to the conclusion that the experiment was ready to be attempted at SACLA. A draft proposal was prepared in consultation with many colleagues at the Harima campus ([Annex 2](#)) and will be finalized for next deadline (May 2012).

I had extensive discussions with members of Dr Masaki Yamamoto's group on a whole range of topics concerning the current limitations of experimental capabilities on synchrotron radiation crystallography, the current state of the art for micro-focus X-ray beams on the most advanced synchrotron sources, propagation of radiation damage, validation of structures, etc. Potential improvements were discussed.

I attended the RSC Seminar "[Biological studies with photon light sources –present and future perspectives– \(I\)](#)" on 20th February and gave a lecture entitled "X-ray Structural Biology: From X-ray Tubes to X-ray Free Electron Lasers" ([Annex 3](#)).

I also interacted with Prof Yoshitsugu Shiro's group extensively with whom I have a joint PhD student and who will go to RIKEN on 1st July 2012 for 2 years. During this we prepared an outline proposal for the Human Frontier Science Program entitled "Nitric Oxide Reductase: Molecular Mechanism of the N₂O Emission, its Regulation and Global Impact" ([Annex 4](#)).

RIKEN Head Office, Wako Campus (23rd to 25th February 2012)

I travelled from Harima on 23rd and visited the RIKEN's head office on 24th February 2012. I was fortunate to have an audience with Prof Noyori and other senior members of RIKEN and was able to discuss wide range of issues including the future steps in RIKEN-Liverpool partnership. We agreed to plan a Liverpool-RIKEN symposium in Tokyo in November 2012.

In addition I had extensive discussion with the International office of RIKEN and several group directors at RIKEN. I visited several of the laboratories ([Annex 5](#)).

Photo: Prof Hasnain with Prof Noyori and other senior members of RIKEN management.



The discussions with Dr Yamanake at BSI were very fruitful due to mutual interest in motor neuron disease. Dr Yamanake and a junior researcher were invited to join an international consortium (ICOSA) founded by me in 2001. Dr Yamanake was invited to attend the 10th meeting held in March 2012 in Liverpool. At BSI, I had a very engaging meeting with Prof Mikoshiba on IP3 receptor and the latest structural studies. His collaboration with colleagues at Liverpool is bound to strengthen further.

SAGA light Source (28th February 2012)

I travelled to Kyushu on 27th February and visited the SAGA Light Source on 28th February 2012. I gave a lecture on "SR provides opportunity to combine Crystallography, Scattering & Spectroscopies for Structure-Function studies of enzymes".

The visit to Saga light source was very informative to learn how local Government influences large-scale

Photo: With Drs Yasusharu Hirai, Yamamoto & Kamitsubo in the experimental hall of SAGA light source.



science infra-structure investment to stimulate local economic and knowledge growth thus making local areas attractive to live.

Conclusion: A strong and more wide-spread partnership and collaboration between UK and Japan is highly desirable. It is essential that next generation of scientists spend significant period e.g. via partnership PhD programmes. At a personal level, collaborations with Drs Shiro, Yamamoto and Yamanake will strengthen as a result of this visit.