JAMES RENNIE BEQUEST

REPORT ON EXPEDITION/PROJECT/CONFERENCE

Expedition/Project/Conference Title: International Research Experience Exchange.....

Travel Dates: 26th Jun – 8th Jul, 2008 .....

Location: Tokyo, Japan.....

Group Member(s): Denis Trubitsyn .....

Aims: To report our latest progress and get a laboratory placement to exchange research experiences.....

OUTCOME (not less than 300 words):

A travel grant from James Rennie bequest gave me a unique opportunity to travel to Japan to the Tokyo University of Agriculture and Technology and undertake a short research project. My visit was very successful and I managed to achieve all my aims: to report our results, exchange laboratory techniques and establish a future collaboration. When I arrived I was introduced to all Professor Tadashi Matsunaga's group members and given a tour of their research facilities. There are around 40 people involved in the work in this research area and it was a very different experience to work in a strictly organised laboratory with several departments.

In my PhD studentship at the University of Edinburgh under the supervision of Dr. Bruce Ward I work on marine vibrio MV-1, a microorganism that has magnetosomes, intracellular magnetic crystals of magnetite or greigite surrounded by a membrane with associated proteins. Chains of magnetosomes are found in all magnetotactic bacteria, a diverse group of Gram-negative aquatic prokaryotes. It is likely that magnetotactic bacteria use chains of magnetosomes to orient along the Earth's geomagnetic field.

On the second day I gave a talk to the Professor Matsunaga's laboratory colleagues where I reported the recent progress and achievements of our group in Edinburgh. These included our progress on the investigation of the "magnetosome island", a cluster of genes that is believed to be involved in magnetosome formation, magnetosome membrane proteins identification and genome sequencing. This presentation was followed by an informal discussion where differences in approaches and methods between our labs were outlined. Novel sequencing methods that we were able to use at School of Biological Sciences Sequencing center created a lot of interest and could bring potential orders.

In the practical part of my visit I was shown a particular technique of isolation of magnetosomes. It was known that this group is using weak ultrasonication in order to separate crystal chains aggregates during washings, however until I was given direct demonstration it was not possible to reproduce it in our laboratory here in Edinburgh. This method allowed isolating magnetosome membrane proteins as a cleaner fraction. Afterwards, these proteins were identified using Mass Spectrometry. These data will help us to identify genes that are involved in magnetosome formation.

Another useful outcome of this visit is the TEM microscopy experiments. Pictures of the strain of magnetotactic bacteria that I am working on and its magnetosomes were taken. As it was expected the shape and size of these crystals was significantly different to those of the strains *Magnetospirillum magnetotacticum* AMB-1 and *M. magnetotacticum* MS-1 and can be described as truncated hexa-octahedrons (Figure 1).

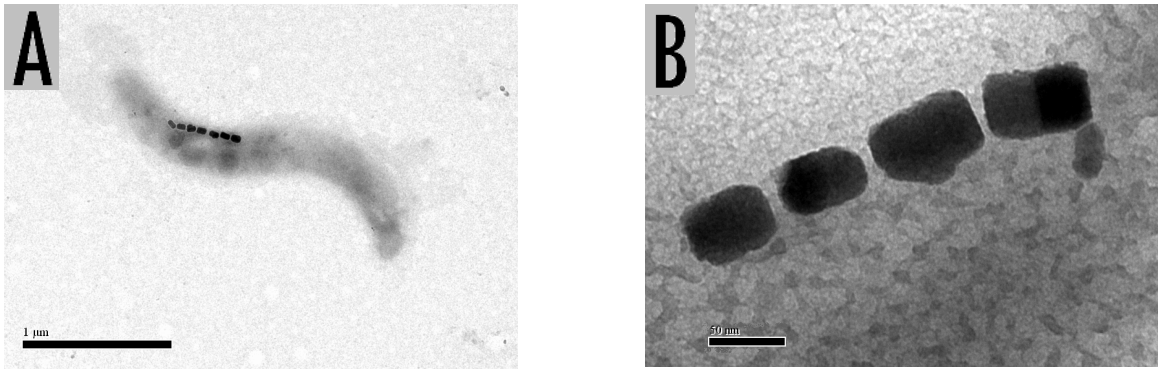

Figure 1. TEM images of marine vibrio MV-1 cell (A) and a chain of magnetosomes (B).

The future collaboration was proposed with Dr. Masayoshi Tanaka. Hopefully he will be able to visit our group in Edinburgh in the near future and undertake research using our facilities.

Finally, cultural part of my visit was very bright and colourful. People in Japan are incredible in their hospitality. They really make visitors feel very special and try their best to meet any of their requests. I was invited for dinners where I had all the best that Asian cuisine has to offer. Generally in Japan it is very easy to observe both extremely modern and traditional sides of life. Japanese culture is so different from what is common in Europe that it is definitely should be considered for a visit.