Collaborative research program among Kumamoto University and King's college London

Introduction:

8-Nitroguanosine 3', 5' -cyclic monophosphate (8-nitro-cGMP) is a novel second messenger of nitric oxide (NO) and its discovery sheds light on new areas of chemical biology of signal transduction by NO (Nature Chem. Biol., 3: 727, 2007). We already have found this novel biomolecule is related with several inflammatory responses in accordance with oxidative and nitrative stress conditions. This potential electrophilic oxidant has unique properties to modify proteins which we named as s-guanylation. In our previous study we have found that this molecule has role in vasodilation. Thus we hypothesize that protein kinase G, a cGMP dependent protein kinase, might also be guanylated by this novel molecule followed by activation in a cGMP independent manner. Dr Philip Eaton's group from King's College London has recently published about the oxidative stress related activation of PKG1α (Science. 317(5843):1393-7, 2007). This made us interested in finding the modification of PKG1α by 8-nitro-cGMP and consequent activation of PKG1α and we decided to start collaboration with his group to find out any possible guanylation in PKG1α leading to kinase assay to speculate its role in kinase activation.

Start of the trip:

According to the prefixed schedule I left Kumamoto at 9th February through Fukuoka for the trip to London. I arrived Heathrow at around 4 pm the following day and received by Dr Philip Eaton at King's College London at around 6 pm while it was raining badly outside. The same evening Dr Philip invites another of his lab member and me to a restaurant for dinner along with some initial talk about our forthcoming plans. It was a delicious dinner along with traditional Bangladesh food plus some interesting scientific talks.

St Thomas hospital lambeth road side view.

Research brief at London:

On the following day we had a fruitful scientific discussion on our research strategy and schedules of research. As the basis of my trip was to find any possible modification in cGMP dependent protein kinase G by the novel 2nd messenger 8-nitro-cGMP, we first tried to find guanylation through western blot. It was my first experience to work with radioactive isotope. I had to take a brief training by Dr Joseph Burgoyne about the radioactive isotope dependent kinase assay. The kinase assay is a highly sensitive method for the analysis of PKG activity. Its takes the whole day and was way too hard. The most important part of radioactive kinase assay was to take care of the small droplets of hot ATP which can make hot spot (radioactive spot) on your bench top. So we need to take care all through the procedure. And at the end of the day it was way too tiresome to check all of our bench top, uniforms etc with radioactive counter machine

St Thomas hospital river side view.

(Geiger-Müller counter). I also learned about the immunoaffinity pull-down assay to purify protein kinase G from the heart sample. And last but not least, the open discussion about any topics of research really made me knowledgeable about many things. It's a common style for the lab mates and Dr Philip was to work all the day and at the end of the day they used to go for drinking while discussing all the days work. It was relaxing to talk the day's work and to talk about next day's plan.

Big Ben

Tower bridge

Things that amazed me the most was the generosity of both Dr Philip and Dr Joseph. They were tremendously helpful and kind for any sort of problem in research or in the personal life at London. It would have been quite difficult to stay in London, an unknown city for me, without their generous help. Dr Joseph guided me in my personal shopping, buying foods and obviously guiding me through the London sight seeing.

Beauty of London:

About my trip to London, it would be injustice if I don't share my feelings about the sight seeing by the river Thames. Most of the London's beautiful and popular structures are along the Thames River. In the evening I used to go for jogging along the river thames with my tiny little camera in my pocket. While running through thames walk you will see the London modern art gallery, the London aquarium, London eye, Waterloo rail station, Big Ben, parliament house, London bridge, and the most amazing tower bridge.

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Thames view, London eye

The old most cathedral in London, St Paul's cathedral is also situated in the riverside. The amazing western architecture and modern architecture dwell at the same place where u can see big oval shape city hall, and gekkin.

St paul cathedral viewed from the thames side walk

Brief achievement and conclusion: Well, now let me come back to my research achievement and the future collaboration plan with King's college London Dr Phil's group. After a three week short research study we could develop a hypothesis related to the guanylation of Protein kinase G in some important physiological syndromes. And we have come to the commitment on doing some further research work on collaboration. With the successful fulfillment of our ongoing study we might be able to publish our data in high quality journal that hopefully will bring prestige to the research of Kumamoto university graduate school of medical sciences. Overall it was a successful trip for me. We are still working on the same hypothesis to give it a good shape in publication form. And regarding gaining and sharing knowledge, it was an awesome trip. Their education system made me amazed. I hope in future Kumamoto University will continue arranging this kind of research trip so that graduate students are benefited with different working environment, multicultural activities and sharing ideas and views. I left London with a meaningful trip at 28th February, 2009, arriving Kumamoto at 1st march, 2009 safely.

A modern architecture