

Advancing education and research through Maplethorpe fellowships

Maplethorpe fellowships have, since 1987, provided postdoctoral researchers with an opportunity to undertake pharmacy-related research at King's College or the School of Pharmacy, University of London. **Peter Taylor** and **Marc Brown** look at the continuing success of the scheme

Over the past two decades, 55 young post-doctoral research scientists, most with a pharmacy degree, have benefited from the generosity and foresight of Cyril Wheatley Maplethorpe.

C. W. Maplethorpe was a former president of the Pharmaceutical Society and had a passion for pharmacy education and the career development of academic pharmacists. His will provided for the establishment of C.W. Maplethorpe postdoctoral fellowships and, after his death in 1983, the University of London established a panel, appointed by the vice-chancellor, to select candidates for the promotion of pharmaceutical education and research at Chelsea College (now part of King's College London) and the School of Pharmacy, University of London.

The panel is charged with the task of selecting two fellows, if possible registered pharmacists, each year after open competition. In fulfilment of the terms of the bequest, these two-year appointments involve a strong element of teaching to pharmacy undergraduates and the fellowships have provided a springboard for several beneficiaries to pursue a career in academia in the UK and elsewhere. The fellowships attract applicants from a wide range of institutions, including many from overseas, and have funded research programmes in a wide range of pharmacy-related topics. Aspects of the life and career of C.W. Maplethorpe as well as details of the professional activities of some of the early recipients of these awards were the subjects of a previous article (*PJ*, 2 February 2002, pp148–9).

The University of London School of Pharmacy and the department of pharmacy at King's College London have vibrant research programmes in key areas of pharmacy-related research and their activities are reflected in the topics selected for investigation by Maplethorpe fellows.

Eighteen of the 55 "Maplethorpes" have been awarded in the areas of drug delivery, metabolism and absorption, with infections, vaccines and microbial diagnostics accounting for eight. Six fellows pursued research into neurological agents and receptors, with a further four studying cancer therapeutics; four awards have also been made to enable fellows

to examine other pharmaceutical agents and their targets. Five were involved with the practice of pharmacy, three developed analytical technology and two unravelled counterfeit medicines. Proteins also figured, with a research programme examining structure and two were involved with peptide and protein transport. There was one award each in chemical synthesis and cell metabolism.

Awards are offered to the best candidates regardless of their potential affiliation; 29 awards have been realised at King's and 26 at The Square reflecting, we believe, a healthy balance between the two institutions.

Maplethorpe fellows

Every spring, fellows are selected on merit; although a wide range of topics have been covered over the past 18 years, the emphasis continues to be on the natural sciences. Susan Kenyon (1996–98) was no exception, examining the role of the vitamin B₁₂-dependent enzyme methionine synthase and its dependent pathways in cancer formation and treatment. Some tumour cells had been found to be methionine dependent and Ms Kenyon unravelled some of the complex inter-relationships between cellular responses to enzyme inducers and inhibitors and amino acid metabolism in various cell lines.

After finishing her "Maplethorpe" at The Square she moved to the pharmacy department at King's, working as a postdoctoral fellow with John Timbrell on the mitochondrial toxicity of nucleoside reverse transcriptase inhibitors *in vitro*. She then spent three years at Imperial College medical school continuing with the toxicology theme, investigating desloratadine metabolism and the skin penetration of various chemicals.

She now works as a scientific assessor in the pharmacovigilance risk assessment unit at the Medicines and Healthcare products Regulatory Agency. She writes: "Although I no longer work in academia I am still using



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C.W. Maplethorpe: 55 scientists have benefited from his generosity and foresight

my research skills and my scientific and pharmacy knowledge are invaluable for my work here."

Nicola Potz (2001–02) also chose the public services after her "Maplethorpe". Her fellowship was undertaken at King's in Ben Forbes's laboratory, elucidating the genes involved in the resistance of *Pseudomonas aeruginosa* to biocides such as Hibitane, Hycolin and Milton. These problematical bacteria acquire tolerance to in-use levels in response to prolonged exposure to increasing concentrations of these agents. Ms Potz became a clinical scientist at the antibiotic resistance monitoring and reference laboratory at the Central Public Health Laboratory in Colindale, with responsibility for the management of national antibiotic resistance surveys — another example of a "Maplethorpe" preparing the ground for a future career in the medical sciences.

Some former fellows have ventured into the pharmaceutical and biotechnology industries. Naseem Mushtaq (2003–05) undertook some groundbreaking work on a new strategy for the treatment of life-threatening systemic bacterial infections in neonates, using an

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agent that modified the bacterial surface in a way that favours removal of the pathogen from the blood and tissues.

Since leaving The Square last year, Ms Mushtaq has been working for Domantis Ltd, a “therapeutic antibody” company based in Cambridge, on a tumour therapy project that is linked with the nuclear medicine group at London’s St Bartholomew’s Hospital. Her enthusiasm for the scheme is obvious: “The fellowship allowed me to build on my strengths in research in an academic environment and gave me the opportunity to interact with pharmacy students. It increased my confidence as a scientist and was by far the best experience in furthering my career opportunities. The scheme encourages independence and self-sufficiency and is generous towards the recipients.”

Atiya Rao (1999–2000) became a promotional affairs adviser with AstraZeneca after research at King’s involving the transport of peptides across a human bronchial epithelial cell culture model of the airways. Evidence was obtained that radiolabelled peptides were transported via the paracellular route and the only constraints on transport were the size of the tight junctions between cells: the lower the molecular weight of the peptide, the greater the rate of transport.

Emma Dunne (2000–01) began training as a patent attorney following her fellowship at The Square, in which she worked on GABA_A receptor complexes.

Seah Kee Tee (2001–2002) spent a productive period as a fellow at King’s researching the use of biodegradable microspheres for the pulmonary delivery of hydrophobic drugs before becoming a product development and formulation scientist at GlaxoSmithKline. Mr Tee developed a novel *in vitro* dissolution-absorption model using cultured respiratory epithelial cells supported in a modified twin stage impinger and demonstrated its value in the evaluation of the effect of formulation factors on the delivery of aerosolised drug from dry powder inhaler formulations. His move into industry must have seemed a natural progression.

Hendrik Neubert (2002–04) applied his talents in analytical technology to develop a robust method for the detection and quantification of the glycoprotein hormones human chorionic gonadotrophin (hCG) and human erythropoietin (hEPO) in biological fluids. Using affinity capture MALDI TOF mass spectrometry, he made telling contributions to fundamental aspects of peptide mass spectrometry and in the characterisation of synthetic and recombinant macromolecules, making a seamless transition from a fellowship at King’s to manager of Pfizer’s clinical proteomics and biomarker discovery clinical assay group.

For some, the fellowships became a stepping-stone to life in academia. John Malkinson (2002–02) researched solid phase glycopeptide synthesis in relation to their optimisation for delivery and bioavailability be-

Maplethorpe fellows appointed since 2002*

2002–05	Sara Garfield	Square	Medicines management of chronic conditions
2001–04	Vikas Jaitely	Square	Pulsatile delivery of proteins and peptides
2002–04	Nilesh Patel	King’s	Delivery of DNA by pressurised metered dose inhalers
2002–04	Hendrik Neubert	King’s	Detection and quantification of glycoprotein hormones
2002–04	Nicola Wilson	Square	Spectroscopic identification of counterfeit medicines
2003–05	Olivia Corcoran	King’s	Protein binding of reactive non-steroidal anti-inflammatory drug metabolites
2003–05	Alessandra Gaeta	King’s	Iron chelators for treating neurodegenerative disorders
2003–05	Naseem Mushtaq	Square	Attenuation of bacterial virulence by capsule hydrolysis
2003–05	Behrooz Nasser	Square	Vesicular shuttle system within tether nanotubes
2004–05	Omid Masoud	King’s	Aerosolised drug deposition in oropharyngeal models
2004–	Laila Kudsiova	King’s	Cellular fate of non-viral gene delivery vectors
2004–	Catherine Lane	Square	Pharmaceutical proteomics of cytochromes P450
2004–	Khuloud Al-Jamal	Square	Heparin-binding dendrimers as anti-angiogenics
2005–	Cynthia Bosquillon	King’s	Isolate perfused lung for screening inhalation products
2005–	Geeta Hitch	Square	Treating anthrax by selective capsule removal

*For earlier fellows, see PJ, 2 February 2002, p149

fore accepting a lectureship in biological chemistry at the School of Pharmacy. He said: “The Maplethorpe was an important stepping stone in terms of the future direction of my career, from a research and particularly a teaching point of view. I was particularly nervous in my first lecture and could never have imagined myself in that kind of situation prior to that point. However, it went really well and, nervousness aside, I enjoyed it.”

Vikas Jaitely (2001–04) has been able to obtain a grant from the Heptagon Fund to continue his Maplethorpe work on ionic liquid-mediated pulsatile delivery of proteins and peptides at the Square.

The fellowship awarded to Nilesh Patel (2002–04) was put to good use at King’s in the area of DNA delivery by pressurised metered dose inhalers.

Mr Patel continues to pursue this line of research as lecturer in pharmaceuticals at King’s. He said: “Being awarded the fellowship four years ago was a turning point in my career. I was given the intellectual freedom to conduct and develop research in my chosen field, as well as gain invaluable teaching experience.”

Nicola Wilson (2002–04) was awarded her “Maplethorpe” in the important area of counterfeit medicines. At the Square, she developed a near infrared microscopy method to allow the identification of counterfeit Viagra, showing that about half of all samples obtained via the internet were fake. She hopes that her contribution will help the fight against the trafficking of counterfeit medicines and continues in research as the holder of a postdoctoral fellowship in the centre for pharmacognosy at the Square through an EU-funded project on the use of cannabis for the treatment of migraine and rheumatoid arthritis.

She said: “I was proud of being awarded the post, particularly as it gave me a chance to research in an area that is of great interest to the general public. I also enjoyed the opportunity to teach and interact with undergraduate students as part of the Maplethorpe

programme. Through this opportunity I have found that I would like to remain in the academic/research arena.”

Just over one year ago, Olivia Corcoran (2003–05) concluded her fellowship at King’s, where she had used nuclear magnetic resonance to determine the protein binding of reactive metabolites from non-steroidal anti-inflammatory drugs. She is now a senior lecturer in forensics at the University of East London. She retains her links with pharmacy at King’s, holding the position of visiting research fellow.

Behrooz Nasser (2003–05) recently completed his Maplethorpe at the Square now teaches at King’s. He said: “Taking on the fellowship has been instrumental to my continuous work as an academic. One of the great gifts awarded to a scientist is the one that allows them to delve deeper into areas of fundamental interest to themselves and to society.”

Co-operation

What does the future hold for the “Maplethorpes”? We are confident that applicants of sufficient quality will continue to come forward to build on the traditions that have been established since the inception of these prestigious awards: high quality research in areas of fundamental importance to a rapidly evolving discipline, combined with a commitment to excellence in the teaching of pharmacy undergraduates.

There is no doubt that the involvement of London’s two centres of pharmacy education has made us more aware of each others’ strengths and promoted a higher level of “cross-fertilisation” than may otherwise have been the case.

It is not only our fellows that benefit from the unique opportunities provided for in the legacy of Cyril Maplethorpe. We give the final word to a recent fellow, Omid Masoud: “Thank you, Cyril and Margery [his wife], for giving me and so many others a start in academia — if only you could see what an institution you have established.”