Alexander A Selyanko
9th November 1952 – 23rd September 2001

Alex Selyanko belonged to that band of visitors and emigres from the Bogomoletz Institute of Physiology in Kiev which has contributed so greatly to UK Physiology over the past ten years or so. Alex graduated from the Department of Biophysics at Kiev State University in 1974 and joined Professor Vladimir Skok’s Department of Autonomic Nervous System Physiology at the Bogomoletz Institute – first as a postgraduate student, then as a Research Associate, finally becoming a Leading Research Associate in 1989. During this period, he made some notable contributions to our understanding of the fundamental aspects of synaptic transmission in mammalian sympathetic ganglia – many of which were (at that time) in advance of most work in the ‘West’. For example, he and his colleagues Victor Derkach and Vladimir Skok were the first to record the excitatory post-synaptic currents in neurons of mammalian sympathetic ganglia under voltage-clamp conditions, using two independent micro-electrodes – a technical feat of some note in these relatively-small cells (in 1979: ref. 1). They were also the first to show the voltage-dependence of the post-synaptic conductance underlying the excitatory postsynaptic potentials in these synapses (ref. 1, 2); and subsequently found that the major factor shaping the time course of post-synaptic currents in these nicotinic synapses was the deactivation kinetics of postsynaptic nicotinic acetylcholine receptors (ref. 3). Many years later, this conclusion was extended to central glutamate synapses by other investigators (Nature, 1990: 346, 565-567), and is now one of major concepts in the field.

Also, Alex and his colleagues were the first to record single-channel currents through the nicotinic receptors of mammalian sympathetic ganglion cells and to show how the macroscopic currents at nicotinic synapses are governed by the properties of the single channels (ref. 4). His work on the pharmacology and gating of the nicotinic receptors in the ganglion cells helped to establish the fact (confirmed by molecular biology some 10-15 years later) that neuronal nicotinic receptors formed a distinctive sub-class of nicotinic receptors. In his studies of drugs that selectively block nicotinic synaptic transmission in the mammalian sympathetic ganglion, it was discovered ganglionic specificity was related to the open channel blocking action of these compounds (ref. 5 and 6). As a result, a number of promising drugs with a potential to treat peripheral disorders were synthesised and tested, in collaboration with an organic chemist, Dr. Valeriy Gmiro, of the Institute of Experimental Medicine, St.Petersburg. All of this work was documented in an authoritative book in 1987, subsequently translated into English in 1989 (ref. 7). For this work, Alex Selyanko shared the 1989 USSR State Prize in Science and Industry with other scientists from Ukraine and Russia, and received the State Diploma for Discovery in Science that same year.

In 1983, Alex gained a Wellcome Trust Travelling Fellowship award to visit our laboratory at the School of Pharmacy in London. Here, he used his expertise in micro-electrode recording from sympathetic neurones to provide the first substantive evidence that inhibition of the M-current contributed to the synaptically-generated slow excitatory post-synaptic potential in mammalian sympathetic neurones (ref. 8). He returned to Kiev in 1984, then, after an intervening (and productive) year in Peter Smith’s laboratory in Alberta, he returned to the U.K. in 1991. Again he immediately made a major advance by obtaining (with Cathy Stansfeld) the first recordings of single M-type potassium channel currents in sympathetic neurones using cell-attached patch electrodes, and by showing that these channels were closed by stimulating the muscarinic receptors in the cell membrane outside the patch, thereby suggesting the requirement for a diffusible messenger (ref. 9). Using inside-out patches he went on to show that they could be inhibited by intracellular calcium ions – one of the potential ‘diffusible messengers’ involved in their regulation (ref. 10). More recently, he played a lead role in a series of studies (many in collaboration with other laboratories) on the properties of the KCNQ family of potassium channel subunits, some of which were shown by Wang et al. (Science, 1998: 282, 1890-1893) to contribute to native M-channels (refs. 11-14). One paper in the Journal of Physiology (ref. 14) received the Journal’s accolade as one of its fifty most read papers in July 2001; another in collaboration with David McKinnon’s group in New York (ref. 13) gained a note in Nature Neuroscience Reviews (vol.2(4), p. 226).

Alexander died of cancer on 23rd September 2001, at the untimely age of 48. One of his last acts, on behalf of the Physiological Society, was to write a review for the Spring Science Reviews (vol.2(4), p. 226).
2001 issue of the Society’s Magazine on “Molecular Determinants of the ‘M-current’”. Perhaps ironically (but also optimistically), during his final months at the bench he was investigating the role of KCNQ channels in regulating the activity of nociceptive neurones, and observed how the KCNQ channel opener retigabine reduced their excitability (ref.15) – so possibly opening new avenues for the treatment of the pain that he (and others with his condition) suffered.

Everyone who knew him and worked with him has commented not only on how superb and dedicated a scientist he was, but also – and more importantly – how nice a person he was. Thus, Victor Derkach writes: “He was an example of a very talented individual, who nevertheless made exceptional demands on himself to work hard in achieving his goals, and was always hungry to explore new horizons. Despite all accomplishments, he was consistently modest in his working style and in the relationships with people surrounding him. Warm and easy-going, he was a person with whom it was always a pleasure to collaborate or to work with side-by-side. It is very hard to think that his life was ended so abruptly and so early.”

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References

2001 Grants Review

2001 was a busy year for grants, with schemes proving very popular both with Members and Non-members. Currently, the Physiological Society grant schemes include the Affiliate Travel Grant, Intercalated BSc Bursary, Dale & Rushton Fund, MSc Bursary, Post-Graduate Support Fund and the Vacation Studentship Scheme.

The Affiliate Travel grant scheme is for those Affiliate Members of the Society who are resident in the British Isles, with funding priority given to postdoctoral scientists and PhD students in their final year. The maximum award under this scheme is £600, and Affiliates use the money to travel to meetings all over the world. Throughout 2001, this grant scheme proved extremely popular, with the amount requested by applicants being more than double the available funds. The result was that 45% of all requested funds were awarded.

The Intercalated BSc Bursaries also proved popular, with all of the available funds being awarded during the year. Under this scheme, a maximum award of £2,000 is given to students who are resident in the British Isles and are dental, medical or veterinary students to help fund an intercalated year studying physiology.

As ever, the Dale & Rushton Scheme attracted many applications throughout 2001. This scheme is open to all scientists seeking funding to visit another country for collaborative work, or to attend a workshop or meeting. The maximum award for this scheme is £800. The scheme was over subscribed with only a little over 66% of the support requested being funded.

The MSc Bursaries are given to graduates of UK institutions who are embarking on an MSc in a physiological field, especially those who are starting Physiology as a new discipline. This year, the scheme was under subscribed, and so we shall be looking