



Prof. Almaz A. Aldashev (1953–2016)

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Almaz Aldashev was a man of his people. He was never more happy than when travelling through his native mountains, talking, eating and singing with his fellow Kyrgyz, drinking kumis, fishing in streams, and sleeping in yurts.

He was born on November 1, 1953 in Frunze (now known as Bishkek), then capital of Kyrgyzstan and part of the Union of Soviet Socialist Republics (USSR). His father, Abdulkhai Aldashev, was professor of veterinary science at the National Agrarian University, as well as a member of the Writers' Association of Kyrgyzstan (now the Kyrgyz Republic). His mother, Fatima, devoted herself entirely to raising five children. Together, they stimulated and nurtured Almaz's broad education and deep understanding of his country's cultural history.

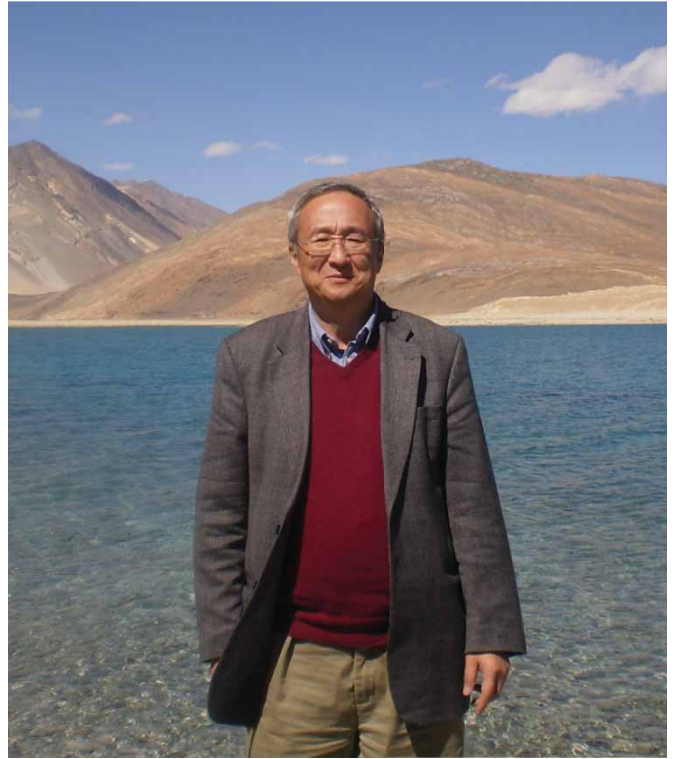
Almaz spent his undergraduate years in Moscow. In 1980, he became a research assistant in the high-altitude laboratory in Kyrgyzstan, sparking a career-long interest in hypoxia-induced pulmonary hypertension. He was awarded his PhD by the Moscow Academy of Sciences in 1983 on "Receptors, intracellular signalling and hypoxic proteins at high-altitude pulmonary hypertension". He was soon Head of the Laboratory of Molecular and Cell Biology within the Institute of Cardiology in Bishkek, and in 2002, he became Director of the Institute of Molecular Biology and Medicine. His scientific leadership was recognised internationally and he was honoured by his country through a number of national awards, including "Honoured Scientist of the Kyrgyz Republic" in 2004. He became a Fellow of the National Academy of Sciences of the Kyrgyz Republic in 2000, an Academician (full member) in 2006 and then its Vice President in 2013.

He was a scientist during a time of major political change. Early in his career, he was one of a small group of young scientists who worked to bridge scientific co-operation between the USSR and USA. With the independence of Kyrgyzstan in 1991 (the Tulip Revolution) came the opportunity for him to travel to the West and to invite scientists to his homeland with greater freedom. Acutely aware of the isolation and financial challenges of conducting science in the new Kyrgyz Republic, he embraced international collaboration enthusiastically. He became an unofficial ambassador for his country, advertising its natural resources – the mountains and isolated communities – which he knew would appeal to the adventurous interested in the physiology of exposure to hypoxia. From 1995 to 1996, supported by a Fogarty International Center grant, he was Visiting Professor in the Lung Development Biology Lab in Denver, CO, USA. In 1998 and 2001, he was Visiting Professor in the Laboratory of Cellular Physiology and Hypoxia at the University Paris 13 in France. Through collaborations with laboratories across Europe, most notably in the UK, Germany and Switzerland, and his work with the Pulmonary Vascular Research Institute, he developed a strong international network. Through his contacts, he provided the opportunity for many bright young minds to broaden their experience and acquire new scientific skills from travel abroad, and so laid the foundations for the careers of a generation of Kyrgyz scientists. He never forgot his Central Asian roots. He worked relentlessly to build the local science base in Central Asia and ensure that scientists from the region were active members of a global science community.

He published over 140 papers and a major theme in recent years was the role of genetics in adaptation to life at high altitude. More than 50% of the Kyrgyz Republic is above 2500 m. Here, ambient oxygen drops to below 15%. The body responds by hyperventilating, increasing resting heart rate and stimulating red cell production in an attempt to maintain the oxygen content of arterial blood at or above sea-level values, but hypoxic pulmonary vasoconstriction and pulmonary vascular remodelling, together with increased

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erythropoiesis, lead to pulmonary hypertension and place an increased pressure load on the right ventricle. Almaz was aware that there is marked interindividual variation in susceptibility to the physiological effects of a low-oxygen atmosphere and that this has a genetic basis. He held the view that generations of exposure to hypoxia will have selected for genes that confer protection against the detrimental effects of low oxygen on the pulmonary circulation and so some Kyrgyz will be better adapted to their highlander existence. He was very knowledgeable about the origins and tribal history of Kyrgyz highlanders, and required little persuasion to visit the mountains. So began a series of expeditions to high-altitude communities, conducting clinical examinations in local medical facilities to identify those with and without right ventricular hypertrophy and strain, and establishing a cohort of subjects for future genetic and biochemical investigation. He toiled under difficult circumstances, underfunded and always struggling to secure reagents and equipment, but his strength of character, integrity and commitment to science won through. His work highlighted the importance of the nitric oxide–cyclic GMP pathway in pulmonary vascular homeostasis, contributed to the body of data that support the use of sildenafil as a treatment for hypoxia-induced pulmonary vascular disease, and began to throw light on genes that might confer protection and provide novel therapeutic drug targets. One of the highlights of his career was his most recent publication in *Nature* identifying the zinc transporter ZIP12 as a mediator of pulmonary vascular remodelling in hypoxia-induced pulmonary hypertension.

He and his wife Nazira were warm and embracing hosts. Anyone visiting Bishkek would likely arrive in the early hours of the morning. After a vodka toast welcome and a short rest, you were off to the lab for a research meeting. Then would come lunch with a series of short speeches, followed by an afternoon of discussion around data interpretation, publications and future grants. A longer stay would involve a trip to the mountains, for work or pleasure. No visit was complete without dinner in the family home, and an entertaining discussion of people, science and politics until late into the night. Always proud of his son, Alisher, and daughter, Aisulu, more recently, he would be keen to swap stories of grandchildren.

Many have benefited from having Almaz as a colleague. Many more have benefited from his work and will miss him. He was preparing for an international symposium on hypoxia at lake Issyk-Kul (1700 m) this September 24–28 (<https://pvri.info/en/professionals/events/2016/9/24/the-2016-leh-symposium-is-being-held-in-issyk-kul/>). I am sure he would agree that it is an apt place for people to gather and remember him.