

Juri Markovich Vasiliev – My Mentor and Friend

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Abstract—This is an overview of the biography and scientific accomplishments of Dr. Juri Vasiliev, an outstanding Russian cell biologist. Ju. M. Vasiliev published seminal papers on carcinogenesis and cytoskeleton of normal and cancer cells. He founded a scientific school and mentored many students that are now occupying leading positions in different laboratories throughout the world.

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On June 30, 2018 my mentor and friend, an outstanding cell biologist Juri Markovich Vasiliev, passed away. For me, my friends, Vasiliev's students, and an entire generation of Russian cell biologists, his death marks the end of an entire epoch. In this informal obituary, I would like briefly to recall Juri's biography to our colleagues who knew him and to tell those who did not know him personally about the life of this brilliant individual and outstanding scientist.

Juri Markovich Vasiliev was born in Moscow on November 26, 1928. The main part of his life coincided with the Russian tragic twentieth century, which nobody could avoid. The first husband of Juri's mother, Nadezhda Sergeevna Vasilieva, a professional psychiatrist, was executed during the Great Terror as an associate of Marshal Tukhachevsky. The fate of her second husband, Juri's father, was tragic as well. On October 16, 1941, when the German army advanced on Moscow, he left the city together with thousands of Muscovites and went on foot to the city of Kuibyshev, to which Nadezhda Sergeevna and young Juri were evacuated. During this march, he injured his foot, resulting in gangrene. He refused amputation and died in Kuibyshev soon after arrival. He was not yet 42 years old.

Juri Markovich told us the history of his life during long tea breaks, at his home, where his hospitable wife Lina Naumovna often invited us, his young associates, for dinners, during our trips near Moscow, during a hiking

trip to the Caucasus, when we lived in a tent on a desert Caspian beach, and of course when we attended various conferences together in different regions of the Soviet Union. At the end of his life, he wrote short memoirs in which he described his family history and dramatic fate of his relatives. In any ordinary European country, this story would be read as a tragedy unique to a particular family. In our country, this is, alas, a story of typical members of Russian intelligentsia, differing from thousands of similar stories only in details of dramatic events.

This family and its history formed Juri Markovich as we knew him. He was proud of his mother's Slavic and his father's Jewish ancestry; he was a product of two cultures blended by the history of our country. Indeed, on the maternal side, he had Russian relatives deeply immersed in the Orthodox Christianity, who originated as serfs but in later generations, accumulated wealth and became famous Russian merchants by the name Abrikosov. In Soviet times, this family gave the country an outstanding actor, a famous pathologist, and a great physicist — a Nobel Prize winner. Juri's father's family came from a shtetl in Belorussia, and the October Revolution opened for them a road to the open world. While Juri's Russian relatives had to accommodate their religious belief to the atheistic ideology of the country, his Jewish relatives gratefully served the Soviet regime and some of them made good careers, although never reached the high echelons of Soviet bureaucracy. Anyway, the state was equally hostile to both family branches, and many relatives suffered repression and destroyed careers.

Importantly, young Juri was influenced by both sides of the family. Many times, he proudly told me that among

his ancestors there were both an Orthodox priest and a rabbi (however, the existence of a priest is not documented). Thus, the wisdom that was typical for Juri did not come from nowhere.

His interest in biology did not develop by chance. It came early in Juri's life under the influence of close relatives. Once, when Juri's mother was sick, she sent her son to the country house of close relatives Tatiana Detlaf and her husband Nikolay Lazarev, both well-known biologists. Both of them enjoyed teaching biology to a curious teenager. Juri recollected how he and the couple studied tadpole metamorphosis.

As with all Juri's peers, World War II became a milestone in his life. In Kuibyshev, while Nadezhda Sergeevna was busy at the clinic, Juri stayed alone, followed the army maneuvers on the map, and thought about life. Both of them wanted to go home and, as soon as it became possible, made their way into the first cargo plane that flew to Moscow.

In Moscow, Juri dived into studies. At high school, he became a straight-A student and after graduation, was accepted without exams to the Medical Institute, where he became interested in oncology. This interest, together with his acceptance to the laboratory of Lev Manusovich Shabad, the best experimental biologist in the country and an internationally renowned scientist, determined his entire life. Shabad became Juri's great Mentor (with a capital M), as he himself became such a Mentor for all of us later.

Juri Markovich always recollected his years at Shabad's laboratory as one of the happiest periods of his life: experimental work, writing his first papers, discussions, and even more importantly his marriage and the birth of his daughters. The pictures from this period show a thin Juri who is beaming with happiness. The traces of his happiness were evident on his face even when he recollected these years in his old age.

However, the Soviet state did not allow people to be happy for a long time. Shabad was falling out of power, and one of the actions of his enemies was not to allow Shabad's favorite student, Juri Vasiliev, to defend his M.D. thesis. This plan almost succeeded. However, these people did not take into account that in spite of the years of terror, some individuals preserved their honesty and objectivity. And one of Shabad's enemies, when he read Juri's thesis, evaluated it highly. Juri received his degree, but Shabad's laboratory was closed and the famous oncologist was "exiled" to Leningrad. Vasiliev had to switch to another laboratory.

Fortunately, in a few years, Shabad was allowed to return to the Moscow Institute and his collaboration with Juri renewed. And then Juri really won a rare "lottery ticket": the powerful director of the Oncology Institute, N. N. Blokhin, was appointed the President of the Academy of Medical Sciences. This appointment coincided with what at that time became an analogue of "per-

estroika" that slowly started after Stalin's death. New country leaders ordered Blokhin to start communicating with the West in biomedical science. Blokhin was ordered to send a few young scientists abroad for training. Naturally, he chose Vasiliev, as his scientific potential was evident.

Nowadays, young Russian scientists under 40, even if they know the history of Soviet science, cannot even begin to imagine what it meant in the 1960s and 70s for a Soviet man to go to a Western country, especially alone as a free person rather than a member of an official delegation under the close guidance of a KGB "curator". Today, it would be equal only to an offer to go to the other side of the Moon. Juri Markovich was trained first in England and then in the USA.

The perceptions of the young Soviet young scientist travelling to the West were somehow mirrored in those of his Western colleagues. Perhaps only the landing of a spaceship with Martians in front of the Institute could be compared with the arrival from behind of the Iron Curtain of a young Russian scientist who spoke fluent English, was aware of the latest scientific accomplishments, and did not try to evade discussions of the retrograde and ignorant views of Lysenko.

Coming back from foreign trips at that time and later, Ju. M. told us about life in Western laboratories, about the most recent trends and accomplishments in science, and about the persons who were behind these accomplishments. He taught us that science is an international endeavor; that scientists can be French, American, or Russian but there is no French or Russian science, that we in Moscow are not worse than our young colleagues in the West, and that publishing in international journals is important while publishing in a backwater Russian journal is not enough to take part in global international scientific competition. Thanks to Juri's travels, we, who were denied such an option, nevertheless felt ourselves a part of world science. In those dark years, this was extremely important!

While still a young postdoc in Shabad's laboratory, Ju. M. published important results on chemical carcinogenesis. These were pioneering works, since at that time, many people did not believe that external chemicals could trigger tumors. These pioneer publications were noted abroad, and after traveling to England and the USA, Juri became one of the most cited Russian biologists, at that time a rare thing for a Soviet scientist. He was invited to review the field by one of the most prestigious journals in oncology of that time [1].

A great event in Vasiliev's life was his meeting with the great mathematician Israel Moiseevich Gelfand. At that time, Gelfand decided to study biology and assembled around him a circle of leading Moscow biologists with different areas of expertise. From this circle, Gelfand chose Vasiliev to become his closest associate. Gelfand was not only one of the greatest mathematicians

of the twentieth century, but also a strong personality whose influence nobody could evade. Vasiliev was not an exception. Gelfand largely determined the choice of scientific problems, the logic of solving them, and the general approach. The interest of Ju. M. and the new laboratory that Gelfand organized at the Moscow State University on the grounds of "Korpus A" was focused on the locomotion of normal and tumor cells in culture. With Gelfand, Ju. M. published several outstanding papers on this topic and summarized their discoveries in a book translated into several languages [2].

Together with his associates, Vasiliev noticed that colchicine and related compound colcemid, which were known to stop cell division by destroying the mitotic spindle, also affect cells in the interphase. Specifically, fibroblasts treated with colcemid lose their polarization and cannot move along a solid substrate but rather chaotically spread lamellipodia. Since from the earlier works, it was known that the drug stops mitosis by binding to the spindle microtubules, Vasiliev suggested that microtubules play an important role in cell polarization [3].

These were the years when contemporary snobbish attitude to publication had not arrived yet ("one has to publish in *Nature*, *Cell*, *Science*, or at least in *PNAS*; publications in other journals are irrelevant"). Juri Markovich published his most famous paper in quite respectable, but not leading *Journal of Embryology and Experimental Morphology* [3]. Nevertheless, this publication was highly evaluated by the prominent cell biologists including the leader in this field, Michael Abercrombie, who came to Moscow specifically to see the laboratory that produced such an important result. This publication became a "Citation Classic" as evaluated by the International Institute of Scientific Information and a founding paper in a new field. Michael Abercrombie remained a friend of our laboratory and after his death, Ju. M. was invited to participate in a pretigious publication in Michael's memory [4].

Ju. M. Vasiliev published more than 200 scientific works including several books [2, 5]. He was a Professor at the Department of Virology, Moscow State University, and gave many lecture courses and student seminars. He was the advisor on 31 Ph.D. theses and 12 doctoral dissertations. He was the head of a school to which many now well-known international scientists belong. We work nowadays in different areas and have accomplished significant results. However, we work in comfortable environments supported by good budgets and under conditions that are not comparable to those under which Ju. M. worked his entire life. I always feel that I owe to Juri Markovich a great deal of whatever I have accomplished in my science. I am sure that other Vasiliev's students feel the same way.

Ju. M. was neither a revolutionary nor a dissident. Like others, especially those living under the Soviet regime, he had to make compromises. However, he never

compromised in science. He never tolerated any sloppiness either in his own work or in the work of his students. From the very beginning, he made this a rule of his life, starting from the time when he refused to rewrite his M.D. thesis to fit the views of ignorant enemies of his mentor, Professor Shabad. In the worst times, he cared about his reputation and cared how he would be viewed by his students in the distant future.

In his life, he witnessed shameful behavior on the part of many of his colleagues. He told me in one of our long conversations that he drew a lesson from a famous case of Olga Lepeshinskaya, an old Bolshevik, who became a biologist and Lysenko accomplice. She claimed that she saw under the microscope how cells are formed from "non-living" elements. She was supported by powerful Lysenko, stated that her views were in line with Marxism-Leninism, and published papers and books on her "discovery". The ignorance reflected in her views was evident to all educated biologists. Many of them, however, to preserve their positions as Institute Directors or Heads of the Laboratories, had to state in their lectures and papers that they somehow agreed with Lepeshinskaya. After Stalin's death and Lysenko's fall from power, a session of the Medical Academy was called to officially discredit her crazy ideas. Lepeshinskaya was not defensive, she just came to the podium and cited what people sitting in the audience wrote about her works only a few months before. Juri Markovich was there and recollected the face expressions of these established scientists whom Lepeshinskaya cited were.

Ju. M. always remembered and taught us that saying something that seems to be politically beneficial at that moment, or signing a letter, is dangerous: times will change, but the words remain as a shameful spot on your biography. After one of his visits to the West, Ju. M. was asked to write a report to the KGB in which he was requested to characterize what Western scientists he met during his trip think about the policy of the Soviet Union. This Ju. M. refused to do, reasonably explaining that he had already deposited his scientific report about the trip at the Scientific Council of the Institute and no other report was required. After that, for 15 (!!!) years he was not allowed to travel abroad. I remember, I asked him why he cannot write some nonsense, such as stating that everybody whom he met abroad loves the Soviet Union. I remember his answer: "It is not important what I will write. But imagine that one day the KGB archives will be open, and my grandchildren will learn that I was a KGB informer!". That conversation took place in the years of deep stagnation, when the idea that the Soviet regime would collapse looked absolutely crazy.

Juri Markovich was one of the few true scientists whom I have met in my life. Science was the main thing in his life. His name will live as long as we, his students, are alive and will also live on during the life of some of our students. But science has a short memory. Whose

names do we remember in science? Darwin, Mendel, Pasteur, Pavlov, maybe Watson and Crick. That is all? Recently, I learnt that none of my American students know who was Nirenberg, who deciphered the genetic code! So, we all know that one day Juri's name will be not remembered anymore, along with the names of hundreds of other outstanding scientists. But fortunately, science takes care of the devoted scientist in a special way. Unlike art or literature, science has an advantage. Indeed, nobody listens to the music of a forgotten composer. Nobody reads books of a forgotten poet. However, years and years after we are gone, everybody will still know that microtubules determine cell shape and locomotion. And in this knowledge Vasiliev's name will live forever! In this way, the science that Ju. M. loved so much will pay him back!

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