Professor Yukio Fukuyama (1928–2014)

It is with great sadness that we have received the news that Prof. Yukio Fukuyama passed away in his Tokyo home on 17th July 2014. He was a true pioneer and one of the greatest child neurologists in the world, who established international relations and cooperation, taught and mentored young doctors all around the world, including Serbia, where he had always been a dear guest and a great friend. He will be sorely missed.

Prof. Fukuyama was born in Miyazaki, Japan, in 1928. He completed his medical training at the Faculty of Medicine, University of Tokyo, 1948-1952; his internship was at the University of Tokyo Hospital, Tokyo, 1952-1953 and he finished a postgraduate course at the Faculty of Medicine, University of Tokyo, where he also obtained his PhD in 1957. He was promoted to Assistant Professor in 1960 and Associate Professor in 1964 and was appointed Chairman of the Department of Pediatrics in 1967, at the age of 39. In 1994 he received the title of Emeritus Professor at Tokyo Women's Medical University and became Director of Child Neurology Institute, Tokyo. Amongst other involvements, he pursued the international goal by serving as the 4th president of the International Child Neurology Association (ICNA) from 1982 to 1986. His major fields of interest were in child neurology, with emphasis on pediatric epileptology, pediatric neuro-muscular disorders, clinical neurogenetics, and international relations.

Prof. Fukuyama was the first to identify a peculiar type of congenital cerebromuscular dystrophy in 1960 which is now widely known as Fukuyama congenital muscular dystrophy. The causal gene was mapped at 9q31 and gene product called *fukutin* was cloned later (1998) by Toda et al. Furthermore, he made a major contribution in the field of convulsive disorders, especially in very early stages, delineating the concepts of various epileptic syndromes. Thus he described the clinical features and courses of 53 cases of benign infantile convulsions in 1963 and became the first advocator of their basic concepts almost 30 years before Vigevano's findings. Fukuyama contributed pioneering work in the fields of febrile seizures, paroxysmal kinesigenic choreoathetosis, reflex epilepsies and so on. In his doctorate thesis regarding West syndrome he described a significant number of important findings – explained ictal and interictal symptomatology, demonstrated the etiologic heterogeneity of West syndrome, and indicated a particularly high occurrence of the brain stem involvement, especially of the tegmentum. These studies clearly showed that subcortical mechanism may play a crucial role in the expression of this peculiar age-specific syndrome, which had a major impact on the investigation in this area.

Apart from the above stated, Prof. Fukuyama also made a significant contribution to other areas of child neurology by means of writing numerous papers (up to 1984 he had published 433 papers) and books. Naturally, he continued working prolifically even after retirement.

He was the first author or editor of the following books: *Child Neurology* (1982), *Epilepsies in Childhood* (2nd edition, 1984), *Child Neurology Atlas* (1986), *Neurological Examinations in Children* (1987), *EEG and Evoked Potentials in Children* (1990), *Modern Perspectives of Child Neurology* (1991), *Febrile Seizures – Modern Concept* (1991), *Fetal and Neonatal Neurology* (1992), *Crossroads of Child Neurology* (1995), *Congenital Muscular Dystrophies* (1997), *Epilepsy Bibliography – Books and Monographs, 1945–2003* (8th print edition, 2004), *Biology of Seizure Susceptibility in Developing Brain* (2008), *Epilepsy Bibliography – Books and Monographs, 1945–2009* (10th edition, online, 2009).

He was awarded honorary positions in many academic societies: Japanese Society of Child Neurology (Honorary Chairman of the Board of Trustees since 1993), Asian & Oceanian Child Neurology Association (Honorary President since 1992), and Infantile Seizure Society (Honorary Chairman since 2013). He was the honorary member of the following societies: American Academy of Neurology (since 1990), American Neurological Association (since 2006), Canadian Child Neurology Society (since 1985), Child Neurology Society (US) (since 1986), European Paediatric Neurology Society (since 2005), International Child Neurology Association (since 2010), numerous Japanese societies (for epilepsy, pediatrics, clinical neurophysiology, human genetics and teratology).

He was also an active member of the American Association for the Advancement of Science, American Epilepsy Society, American Society of Human Genetics, Sociétè Européenne de Neurologie Pédiatrique (corresponding member since 2002), International Child Neurology Association (4th president, 1982–1986) and Infantile Seizure Society (president, 1998–2001, 2005–2012). In addition, he presided over the Joint Meeting of the 5th International Child Neurology Congress and the 3rd Asian & Oceanian Congress of Child Neurology (Tokyo, November 1990).

Due to his outstanding contributions to neurology, Prof. Fukuyama was repeatedly awarded by the most prominent associations in the world: Frank Ford Lectureship Award (International Child Neurology Association, 1992), Lifetime Achievement Award (World Federation of Neurology, 2002), The William G. Lennox Award (American Epilepsy Society, 2004), Ambassador for Epilepsy Award (ILAE/IBE, 2007), Achievement Grand Award (Japan Pediatric Society, 2008), Special Recognition Award (Japanese Society of Child Neurology, 2008), The Order of the Sacred Treasure, Gold Rays with Neck Ribbon (The Cabinet Office, Japanese Government, 2008), The First Japan Epilepsy Society Outstanding Achievement Award (2010).

Prof. Fukuyama was an enthusiastic visitor of Serbia, mostly before or after being a guest of another European association, where he was regularly invited. I had the pleasure and honor of meeting him in the early 1980s. As a member of International Association of Child Neurology, I used this opportunity to inform the Professor of the state of affairs in our child neurology. He was particularly interested in the development of child neurology in our country so that he could include our results in his publications in *Brain & Development*. Although the world-renowned authority, he was a very pleasant, simple man. We soon established a close connection and I humbly invited him and his wife Ayako to be my guests and to visit our clinic on that occasion. In 1985, I also suggested that he should come to the School of Medicine, University of Belgrade, as the invited Visiting Professor. The topic was naturally Fukuyama type congenital muscular dystrophy and the turnout at the lecture was impressive and the lecture room was completely full. A significant number of doctors interested in child neurology attended. The following day we organized a clinical seminar with the demonstration of rare or unresolved cases at our Clinic for Child Neurology and Psychiatry, Belgrade. The doctors in the audience were thrilled, and the Professor's visit represented a great event. However what really showed his partiality toward Serbia was the fact that he accepted our invitation to come here in 1995 (during the imposed economic sanctions against Serbia) when we organized a symposium on child neurology at the "Sava Centre" in Belgrade. His acceptance facilitated visits by other esteemed neurologists such as Marvin Fishman and Charles Swisher (USA) and others. The symposium was a great success and proved to be extremely morale-boosting for us during those hard times.

On his visits to Belgrade special clinical seminars were organized and the turnout was exceptional. After having demonstrated cases or rare diseases a discussion and questions section would commence. The Professor listened to everything carefully and did his best to express his opinion and suggestions. After the seminar he would stay at the Clinic and continue with tutorials. His opinion was sought in regard to various issues. It is difficult to state all the problems discussed, but we can certainly say that he was a really attentive listener who provided a lot of assistance and valuable advice. The Professor was regularly asked to answer numerous questions or provide second opinions and advice, and he continuously strove to provide assistance and supply his explanation or suggestion. He always gave clear opinions about where a doctor could ideally continue further professional development and at all times was ready to recommend an institution. A doctor who was uncertain whether to accept the offer to be a regular consultant at the Maternity Ward of the Gynecology and Obstetrics Clinic received his explanation regarding the significance and possibilities of early diagnosis of disorders and diseases at that stage, which stimulated her to accept the offer, and has been a consultant for 20 years now, with numerous early diagnosed disorders and diseases in the course of her career.

Having learnt that there were six cases of familial MS diagnosed at the Clinic, he immediately advised us to submit that for the first ICNA Congress, and soon afterwards informed a famous German clinic dealing with MS, and asked them to contact us with the aim to establish further cooperation in the research, which quickly materialized. Talking to the President of the Union of Serbian and Montenegrin Leagues against Epilepsy, he promptly suggested that our country should be included in this presentation of epileptology publications. He also asked to be given a list of books by our authors in this field. That list was sent to him and as previously discussed he included it in electronic bibliographic epilepsy registry which was widely available to professional public as a project carried out by the International League against Epilepsy (ILAE). In this way he made a significant contribution to the promotion of our authors and our country. He also enabled our doctors who work on West syndrome to become foreign members of the Japanese society for this disorder free of charge.

The immensely impressive diversity of Prof. Fukuyama's achievements and contributions to medicine left a testament of his commitment to patients, their families, the university, his co-workers and advances in pediatric neurology worldwide. By leaving some medical dilemmas unresolved when lecturing, he was able to come up with thought-provoking questions and promote lively and informative discussions at conferences and scientific meetings. He had a mountain of literature in his home, which he managed with the help of his wife Ayako. His famous library was very impressive to many people who visited his home (I personally witnessed this during my visit of Tokyo in 1990). He and Ayako loved dogs, and they gave the name Fukutin (the designation of the Fukuyama type congenital muscular dystrophy gene) to one of their dogs. Not only was Prof. Fukuyama a lifelong teacher and mentor, he was also a leader in the field of Pediatric Neurology throughout the world.

In this text I have used the information provided by Professor Makiko Osawa, MD, PhD (President, Japan Epilepsy Society; Chairperson, Infantile Seizure Society; Professor Emeritus, Chairperson of Alumni Association, Department of Pediatrics, Tokyo Women's Medical University) in a farewell article about Prof. Yukio Fukuyama, details from a retrospective article which the Professor himself wrote about his own achievements (Brain & Development 26, 2004), as well as the data by the author of the text regarding 30 years of friendship with the Professor.

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