

IN MEMORIAM

Branislav D. Janković (1920-1994)

Branislav D. Janković graduated from the Belgrade University School of Medicine in 1947. In 1954, he obtained his Ph.D. degree in Immunology (the first Ph.D. in medicine in the history of the Medical Faculty in Belgrade). Ten years later, Dr. Janković became a Full Professor of Microbiology and Immunology. He was Director of the Institute of Microbiology and Immunology at the School of Pharmacy from 1954 to 1985. In 1965, he founded the International Laboratory for Brain Research (Dobrota, Montenegro). In 1969, he founded the Immunology Research Center (Belgrade, Serbia) and served as its Director until 1985 when he retired. Dr. Janković was a Founder of the European Federation of Immunological Societies in 1975, and the International Society for Neuroimmunomodulation in 1986. In 1991, he was elected President of the Science Society of Serbia.

Dr. Janković published 446 scientific articles, and another 23 papers have been submitted for publication or are in press. A total of 252 of these publications dealt with neuroimmunology. He was coeditor of 5 monographs published in the United States, and author of 3 textbooks published in Serbia. Branislav D. Janković's work has been cited more than 4000 times in publications outside Yugoslavia.

His first publication in the field of neuroimmunology appeared in 1958 (Janković, Mihailović, Petković, & Mančić, 1958). Francis O. Schmitt (1964) introduced the term "immunoneurology," and suggested that unknown correlates between the structure and function of the neuron and the brain might be found with the aid of immunological tools and concepts, "especially in view of the remarkable discovery of Mihailović and Janković" (Levine, 1965). This pioneering work (Mihailović & Janković, 1961) demonstrated that the electroencephalographic activity and behavior of the cat can be profoundly affected by anti-brain antibodies injected into the lateral ventricle of the brain. It is also worth mentioning that Branislav D. Janković was a pioneer in thymus research (Janković, Waksman, & Arnason, 1962) and codiscoverer of the role of the thymus in immunity. In 1973, he introduced the concept that the immune microenvironment is a multisystem composed of components derived from the immune system, the nervous system, and the endocrine system (Janković, 1973).

Most of his experimental endeavors were devoted to studies on neuroimmune interactions: (a) immune responses following injection of antigen into the lateral ventricles of the brain (Janković, Drašković, & Isaković, 1961); (b) the first demonstration that the pineal gland is involved in immune reactions (Janković, Isaković, & Petrović, 1970); (c) the effect of brain lesions and stimulation on immune responses (Janković & Isaković, 1973; Janković, Jovanova-Nešić, & Marković, 1988); (d) the role of cell-mediated immunity in the pathogenesis of psychiatric diseases (schizophrenia, dementia, depression, mental retardation, etc.) (Janković, Jakulić, & Horvat, 1977; Janković, 1985); (e) common antigens of brain and thymus (Janković, Horvat, Mitrović, & Mostarica, 1977); (f) the first demonstration of the neuron-thymocyte relationship at the stem cell level (Janković &

Janković, 1983); (g) numerous studies on the relationship between opioids and the immune system (Janković & Marić, 1986; Radulović & Janković, 1994); (h) anaphylactic shock-induced conditioned taste aversion (Djurić, Marković, Lazarević, & Janković, 1987); (i) the immunoneuroendocrine relationship during embryogenesis (Janković, 1988); (j) experimental epilepsy (Vlajković, Djordjijević, Lazarević, & Janković, 1990); (k) the relationship among magnetic fields, brain, and immunity (Janković, Marić, Ranin, & Veljić, 1991); (l) adult and neonatal stress and immunity (Bukilica, Djordjević, Marić, Dimitrijević, Marković, & Janković, 1991; von Hoersten, Dimitrijević, Marković, & Janković, 1993); and (m) immunological and behavioral consequences of aversive brain stimulation (Vlajković, Milanović, Cvijanović, & Janković, 1994).

On June 18, 1994, Branislav D. Janković died at the age of 74. He will be remembered for a long time among his pupils and co-workers. The Scientific Council of the Immunology Research Center has decided that the Institute will hereafter be named the "Branislav D. Janković Immunology Research Institute."

REFERENCES

- Bukilica, M., Djordjević, S., Marić, I., Dimitrijević, M., Marković, B. M., & Janković, B. D. (1991). Stress-induced suppression of experimental allergic encephalomyelitis in the rat. *Int. J. Neurosci.* 59, 167-175.
- Djurić, V. J., Marković, B. M., Lazarević, M., & Janković, B. D. (1987). Conditioned taste aversion in rats subjected to anaphylactic shock. *Ann. N.Y. Acad. Sci.* 496, 561-568.
- Janković, B. D. (1973). Structural correlates of immune microenvironment. In B. D. Janković & K. Isaković (Eds.), *Microenvironmental Aspects of Immunity*, pp. 1-4. Plenum, New York.
- Janković, B. D. (1985). Neural tissue hypersensitivity in psychiatric disorders with immunological features. *J. Immunol.* 135, 853s-857s.
- Janković, B. D. (1988). Embryological correlates of neuroimmunomodulation: A minireview. *Int. J. Neurosci.* 38, 465-478.
- Janković, B. D., Drašković, M., & Isaković, K. (1961). Antibody response in rabbits following injection of sheep erythrocytes into lateral ventricle of brain. *Nature* 191, 288-289.
- Janković, B. D., Horvat, J., Mitrović, K., & Mostarica, M. (1977). Rat brain-lymphocyte antigen: Characterization by rabbit antisera to rat brain tubulin and S-100 protein. *Immunochemistry* 14, 75-78.
- Janković, B. D., & Isaković, K. (1973). Neuro-endocrine correlates of immune response. I. Effects of brain lesions on antibody production, Arthus reactivity and delayed hypersensitivity in the rat. *Int. Arch. Allergy Appl. Immunol.* 45, 360-372.
- Janković, B. D., Isaković, K., & Petrović, S. (1970). Effect of pinealectomy on immune reactions in rat. *Immunology* 18, 1-6.
- Janković, B. D., Jakulić, S., & Horvat, J. (1977). Cerebral atrophy: An immunological disorder? *Lancet* 2, 219-220.
- Janković, B. D., & Janković, D. Lj. (1983). Thymocytes colonies produced by embryonic brain cells. *Fed. Proc.* 42, 1242.
- Janković, B. D., Jovanova-Nešić, K., & Marković, B. M. (1988). Neuroimmunomodulation: Potentiation of delayed hypersensitivity and antibody production by chronic stimulation of the rat brain. *Int. J. Neurosci.* 39, 159-164.
- Janković, B. D., & Marić, D. (1986). Enkephalins and immune response: Suppression of hemolysin-forming cells *in vivo*. *Fed. Proc.* 45, 795.
- Janković, B. D., Marić, D., Ranin, J., & Veljić, J. (1991). Magnetic fields, brain and immunity: Effect on humoral and cell-mediated immune responses. *Int. J. Neurosci.* 59, 25-43.
- Janković, B. D., Mihailović, Lj., Petković, M., & Mančić, D. (1958). Concentrations of deoxyribonucleic and ribonucleic acids in different regions of normal and X-irradiated cats brain. *Arch. Int. Physiol. Biochem.* 65, 639-641.
- Janković, B. D., Waksman, B. H., & Arnason, B. G. (1962). Role of the thymus in immune reactions in rats. I. The immunologic response to bovine serum albumin (antibody formation, Arthus

- reactivity and delayed hypersensitivity) in rats thymectomised at various times after birth. *J. Exp. Med.* 116, 159-176.
- Levine, L. (1965). Introduction to "Immuno-Neurology" and work session report. *Neurosci. Res. Prog. Bull.* 3, 3-7.
- Mihailović, Lj., & Janković, B. D. (1961). Effect of intraventricularly injected anti-N caudatus antibody on the electrical activity of the cat brain. *Nature* 192, 665-666.
- Radulović, J., & Janković, B. D. (1994). Opposing activities of brain opioid receptors in the regulation of humoral and cell-mediated immune responses in the rat. *Brain Res.*, in press.
- Schmitt, F. O. (1964). Molecular and ultrastructural correlates of function in neurons, neuronal nets, and the brain. *Neurosci. Res. Prog. Bull.* 2, 43-75.
- Vlajković, S., Djordjijević, D., Lazarević, M., & Janković, B. D. (1990). Experimental epilepsy: Electroconvulsive shock induces production of anti-brain autoantibody. *Int. J. Neurosci.* 51, 319-320.
- Vlajković, S., Milanović, S., Cvijanović, V., & Janković, B. D. (1994). Behavioral and immunological events induced by electrical stimulation of the rat midbrain periaqueductal gray region. *Int. J. Neurosci.*, in press.
- von Hoersten, S., Dimitrijević, M., Marković, B. M., & Janković, B. D. (1993). Effect of early experience on behavior and immune response in the rat. *Physiol. Behav.* 54, 931-940.

BRANISLAV M. MARKOVIĆ
MIRJANA DIMITRIJEVIĆ
JELENA RADULOVIĆ
OLGICA LABAN
Neuroimmunology Division
Immunology Research Center, Belgrade