

Luboslav Stárka –
Doyen of the Czech Endocrinology
(85th Anniversary)

Dear Readers,

You are holding a special issue of *Physiological Research* which is devoted to prominent Czech endocrinologist, professor Luboslav Stárka, on his jubilee. His pioneering work, visions and dozens of publications, focused especially on steroid hormones, are known throughout the world, and many of them opened new frontiers in endocrinology and biochemistry.

The professional life of professor Stárka is more than 58 years connected with the Institute of Endocrinology in Prague, where he built a steroid laboratory in 1957. He has always been one of the leading personalities, and in the years 1983-1987 and 1990-2001 he was a director of the institute.

Over the years, endocrinology undergone rapid development, and now it represents much broader discipline overlapping the other medical specializations. Endocrine system together with the nervous and the immune system is involved in maintaining the integrity and homeostasis of the organism. Flawless interplay of these three systems enables the body to realize its genetic "programming" and to cope with the constantly changing external conditions. Cooperation of these systems is so narrow that their mediators – molecules carrying a signal, often fulfill bivalent function – as some hormones also act as neurotransmitters, or as cytokines, and vice versa. An illustrative example of such an integrative function is

the interaction of hormones in adipose tissue, gastrointestinal hormones and neurotransmitters of the central nervous system regulating the energy balance of the organism.

Thus, the modern endocrinology focuses not only on endocrine glands and their pathologies but it includes also several other organs and tissues which produce hormones, such as brain, heart, stomach, adipose tissue, skelet, and muscle.

The current research of the Institute of Endocrinology covers a broad spectrum of topics in endocrinology including thyroid and steroid hormone research, molecular endocrinology, neuroendocrinology, immunoendocrinology, endocrinology of aging as well as diabetes, obesity, neurodegenerative diseases, and the study of endocrine disruptors. Investigations currently performed in the institute include not only clinical research, but also basic science and epidemiological studies.

We present a set of publications that document the current research trends in our institute. We hope that our contributions will enable you to get a picture of the wide range of modern endocrinology and of its impact on the development of medical knowledge.

Běla Bendlová
Director of the Institute of Endocrinology

Professor Stárka and Hormonal Physiology – a Brief History of a Pioneer Scientist, Physician and Manager



His life and career reflects the history of science in our country, stigmatized by Nazi occupation and then 40 years of a communist regime. Born in Slovakia in 1930 to Czech parents, he had to move with his family to Prague after creation of the Slovak state under German protectorate. The communist coup in February 1948 reached him just before the leaving exam at the grammar school, which, however, he could not meet, since he was imprisoned by communist secret police and accused for "a hostile activity to state" after denunciation by his schoolmate. Luckily he spent in the jail only three months, thanks to wisdom of the judge, belonging still to the old school.

Though an excellent student, he spent two years as a bricklayer and forest worker, "in a close touch with the working class". This, however, may had been one of the reasons, he was permitted to enter the Faculty of Mathematics and Physics, Charles University, the department of organic chemistry, where he graduated with excellence in 1956. His thesis dealt with anthraquinone derivatives isolated from tutsan. After one year intermezzo in various Prague enterprises (radiocommunications, food industry) he finally anchored in the Research Institute of Endocrinology, led by its first

director, doc. MUDr. Karel Šilink, DrSc. Here he has been 58 years, reaching finally the director post (1983-1987, 1990-2000).

Docent Šilink, himself a pioneer of new approaches in endocrinology, as e.g. radiotherapy of thyroid diseases with radioiodine or modeling of endocrine regulations on analogue computers as early as in late fifties, tasked him to build a steroid hormone laboratory. He left him a maximum possible freedom, which Dr. Stárka accepted as a challenge. He targeted his effort to clinical biochemistry and physiology of steroid hormones, but soon later his scientific activities became broader covering the fields of the whole endocrinology. His first paper on steroids topics on the polarographic estimation of formaldehydogenic and acetaldehydogenic steroids appeared as early as in 1957 in *Naturwissenschaften*. In 1961 he defended his PhD (CSc.) thesis dealing with isolation, identification and synthesis of 7-hydroxydehydroepiandrosterone.

During his short term stays in the Institute of Endocrinology, Berlin Charité or Institute of Microbiology, DAW in Jena, he became acquainted with a number of researches working in a steroid field, which was at that time in the centre of interest of

endocrinologists. His work attracted Prof. H. Breuer, at that time the vicepresident of Deutsche Forschungsgemeinschaft, the dean of the University in Bonn and a world-respected personality in steroid hormone field. Prof. Breuer invited Dr. Stárka to a scientific stay to Bonn, which was still twice repeated (1965, 1966, 1969). The stays in the laboratory of late professor H. Breuer were one of the most fruitful period of L. Stárka's early scientific career. During 1965-1969 he published not less than 19 original papers in high impacted journals with H. Breuer and his collaborators of the Bonn-Venusberg laboratory (R. Knuppen, K. Dahm, E. Dölefeld), dealing with metabolic transformations of steroids and their mechanism. Out of them let us mention at least those concerning the mechanism of equine estrogens or metabolism of epitestosterone, still cited in the literature.

From those times dates his contacts and friendship with leading steroid endocrinologists, as e.g. H. Adlercreutz, E. E. Baulieu, J. A. Gustafsson, R. Knuppen, L. Martini, E. Nieschlag, G. W. Oertel, C. Shackleton, B. I. Tamaoki, J. H. Thijssen, A. Vermeulen, R. Vihko, J. Pasqualini and others, who constituted a new journal *European Journal of Steroid Biochemistry* (1965). The journal, now under the name *Journal of Steroid Biochemistry and Molecular Biology*, represents the leading periodics in the steroid field and Dr. Stárka has been a member of its editorial board since its beginning.

Without interruption of his work in the Institute of Endocrinology Dr. Stárka started to study medicine at the Faculty of Medicine, Charles University, where he graduated in 1972. His experience as a biochemist and physician and also his collaboration with outstanding Czech and Slovak physicians and biochemists (as e.g. professors J. Raboch, sexologist, J. E. Jirásek, embryologist, K. Motlík, pathologist, Dr. J. Obenberger, experimental ophthalmologist, Dr. A. Kasal, steroid chemist and many others) enabled him to reveal gaps in general knowledge and investigate interdisciplinary problems, some of which, as outlined below, later pointed out new ways of research.

With J. Šulcová-Kůtová and J. E. Jirásek he investigated the onset of individual steps of steroid biosynthesis during embryogenesis, the theme crowned by a series of pioneer papers. With J. Raboch and others he published a number of original studies on the role of sex steroids under various clinical states (men with varicocele, hypospadias, males and females with various sexual deviations, women with polycystic ovary

syndrome). In seventies and eighties, with Dr. J. Obenberger he turned attention to so far not much recognized problematic of the role of steroid hormones in internal milieu of the eye. Among other problems they investigated the role of aldosterone and glucocorticoids in (patho)physiology of eye hypertension. This research has brought as many as 38 original papers and was a base of Stárka's DrSc thesis „The role of mineralocorticoids in nutrition of avascular eye tissues“ (1979).

With the author of this article they were the first who developed and introduced radioimmunoassay of steroids in our country. Original RIA methods for steroid anabolics had been for years used as screening tests in doping control. From that times dates also a series of Stárka's papers concerning the antiandrogenic effects of newly synthesized steroids, prepared in the Institute of Organic Chemistry and Biochemistry CAS (with Dr. A. Kasal and others). Experience with immunoassays was later fructified by development of original methods for determination of natural phytoestrogens, in collaboration with already mentioned Prof. Adlercreutz (Helsinki) and Stárka's collaborators and pupils – now professors O. Lapčík and R. Hampl.

Since early nineties, besides director's duties, Stárka's scientific activities focused on physiological role of less common steroids – metabolites or precursors in metabolic pathways. Some of his early findings as demonstration of antiandrogenic properties of epitestosterone or the works on 7-hydroxylated metabolites of dehydroepiandrosterone and other androgens became a starting point of new promising research. This concerns especially the latter: the recent work of R. Morfin *et al.* (Paris) and ours revealed immunoprotective and neuroprotective effects of 7-hydroxylated DHEA metabolites.

The scientific activities of professor Stárka outlined here are far not complete: he encourages young physicians and scientists in PhD study for new ideas and perspectives in biomedical research. Out of his recent activities let us mention the effect of smoking on endocrine status, the participation of steroid metabolome in pregnancy and delivery, the so far unknown effects of dihydrotestosterone and, last but not least, the problematics of neuroactive steroids and their role in such severe diseases as are Alzheimer's dementia or schizophrenia.

In 1991 he habilitated at the 3rd Faculty of Medicine of the Charles University in Prague in human physiology and pathophysiology and one year later was appointed there a professor. His style of scientific work,

characterized by inovative approaches and admirable holistic knowledge of endocrinology and biochemistry inspired his pupils and successors. Among them are on the date five professors and four associated professors and tens of postgraduate students. During his directorship the Institute of Endocrinology became a respected scientific and medical institution, sought out by patients as well as scientists not only from the Czech Republic but also from abroad.

We are pleased that this issue of *Physiological Research* (the journal in which professor Stárka published also 27 papers) may at least partially illustrate the recent work of our Institute, bearing a strong Stárka's imprint.

His unceasing activity is inspiring for his pupils, collaborators, successors and friends, who wish him all the best for the next years.

Richard Hampl