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The Role of Nitric Oxide in the Control of Cardiovascular System: Introductory Remarks

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Thomas Kuhn in his book "*Structure of Scientific Revolutions*" (1970) offers the idea that the progress in science occurs through shifts in paradigms in the respective scientific field. The existing paradigm is replaced by a new one that emerges and/or is expressed on the basis of many new data.

According to the huge body of recent data on nitric oxide (NO•), one could suggest that we find ourselves just at that crucial point where the shift of paradigms concerning the control of cardiovascular system takes place.

The original Claude Bernard's idea has maintained that the sympathetic nervous system, *via* its various mediator tools, is the main determinant of vascular control.

The new era, that started by the Furchgott's discovery (1980) of endothelium-derived relaxing factor (EDRF) and continued by Palmer's *et al.* (1987) and Ignarro's *et al.* (1987) detection that EDRF is NO•, yielded the novel paradigm, expressed by Moncada *et al.* (1991), that NO• is the basic determinant of cardiovascular control.

As a paradox to Moncada's statement sounds the remark of Nathan and Xie (1994) who characterized nitric oxide as, in principle, the waste product of metabolism of a trivial and almost ubiquitous amino acid – arginine. However, before this waste product is excreted from the organism, it is able to affect substantially almost all systems in the organism.

NO• is involved in metabolism and function of each cell of cardiovascular system. His impact is instantaneous, and long-lasting alterations in NO• concentration induce trophic alterations of cells. NO• is involved not only in the direct control of cardiovascular system but also in its control by the nervous system (both central and peripheral). Thus the new findings substantially extend the old Claude Bernard's idea.

The individual studies published in this issue of *Physiological Research* were presented at the symposium "*The Role of Nitric Oxide in the Control of Cardiovascular System*" during the 72nd Annual Meeting of Czech and Slovak Physiological Societies in Bratislava, February 6, 1996.

R. Furchgott who visited years ago Prague and our Department of Cardiovascular Physiology in Bratislava, was remembered cordially in discussions. Very early, during his visit, we discussed with him the possibility that the high blood flow and/or shear stress should be one of the most proper physiological stimuli for the operation of EDRF (Smieško *et al.* 1979, 1984, Gerová *et al.* 1981, 1983). The audience of the Symposium was also informed that Furchgott's family roots stem from the south Slovakia.

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