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Editorial

Novel Actions of Thyroid Hormone

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CLEARLY THE MAIN ROUTE OF ACTION OF THYROID HORMONE is via binding to intra-nuclear receptor proteins, which, in combination with other receptors and accessory proteins, activate or repress expression of specific genes. Expression of the mRNAs and their translation leads to synthesis of new proteins, and it is the action of these proteins that we see clinically evident as euthyroidism, hypothyroidism, or hyperthyroidism. This mechanism has been eloquently established in recent years by molecular biological techniques, and verified by the experiments of nature in which children are born with mutated or absent thyroid hormone receptors.

However, another body of data has been developed identifying actions of thyroid hormone that cannot be fitted within the now-classical nuclear receptor paradigm because of speed of hormone action, relative effectiveness of various hormone analogs, or lack of receptors in the systems under study. These actions include evidence for alterations in cell surface membrane transport of calcium or metabolites, reorganization of the intracellular cytoskeleton, effects on vascular smooth muscle tone, effects on mitochondrial function, and possible function as neurotransmitter. Researchers in this field often feel they are at the mercy of the "thought police," since such skepticism has greeted their reports. We felt it was important to bring these observations into greater prominence, to scrutinize them in a bright light, and to learn their implications for human pathophysiology.

In addition, we sought to scrutinize the role of thyroid hormone in a set of conditions having, as a common denominator, some element of the "Euthyroid Sick Syndrome," and also in psychiatric illness. These data have to do with the potential value of thyroid hormone administration to maintain human organs prior to transplantation, post-operatively in cardiac surgery, after sudden death, in heart failure, in neural rescue after cardiac arrest, and in the management of depression. Much of the research in these fields is done by scientists whose forum is apt to be outside the purvue of most "thyroidologists," and their work may be unfamiliar to this audience.

We have been fortunate to gain the collaboration of a distinguished group of scientists working in these fields. They made oral presentations of their work at a conference held in Toronto at the time of the last International Thyroid Conference in September 1995, and now make their ideas more generally available through this series of updated manuscripts. The papers include reviews of the topics, extensive analysis of the work from individual laboratories, and some unique data that have not previously been available. We feel that the readers of **Thyroid**, be they thyroidologists, cardiologists, surgeons—or others—will learn much from these proceedings.

The conference was sparked by an original suggestion from Dr. Gilbert Mayor. Drs. Chester Ridgeway, William Chin, Larry Jameson, Irwin Klein, Colum Gorman, and Paul Davis share credit for developing the ideas and the program, and selecting the speakers. Knoll Pharmaceutical Company provided an educational grant, and gave the organizing committee an absolutely free hand in all aspects of the meeting. Ms Connie Trump provided unlimited help to the organizing committee. We also with to thank Dr. Jerome Hershman for agreeing to publication of the transactions in **Thyroid.**

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Novel Actions of Thyroid Hormone Symposium

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