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# BIOREGULATORS OF REPRODUCTION

Edited by  
Georgiana Jagiello  
and  
Henry J. Vogel

# BIOREGULATORS OF REPRODUCTION

Edited by

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College of Physicians and Surgeons  
Columbia University  
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# Jacob Furth (1896-1979)\*

In a sense it is appropriate that you have chosen to include a commemoration to Jacob Furth in this symposium on Bioregulators of Reproduction. If he had lived just one year longer, he would have been with you. He would have been sitting in one of the first few rows, for in his later years his hearing was not too good, and he did not want to miss a thing: neither recent evidence putting an old theory to rest nor new data and new techniques holding forth the prospect of new theories and new discoveries. After all, he would only have been 84. Literally, to his dying day, he was interested in the present and future of science. He intended to write an autobiography, but even at the age of 83 there was one more experiment to be done.

While his research was primarily related to pathological processes, notably neoplasia, he was firmly convinced that it was through the study of a disease process that information concerning normal physiology would be obtained. I recall him once citing a remark of Landsteiner to the effect that "Every idea I (Landsteiner) have had came from an observation made at the autopsy table." Jacob Furth also believed the converse: that an understanding of normal physiology is required in order to elucidate the nature of pathological processes.

His studies on and with endocrine tumors and the studies by other investigators on and with these tumors or cell lines derived from these tumors increasingly led to more basic research. He followed these studies with great interest and understanding. It is more than time that separates his studies on the receptor analysis of Paratyphoid B published in 1922 (1) with his Harvey lecture entitled "Pituitary Cybernetics and Neoplasia" delivered in 1967 (2).

Jacob Furth's studies with hormone-secreting tumors go back to his Cornell years in the early 1940's when he studied a functioning granulosa cell tumor in mice (3). At this time his major research interest was not endocrine tumors but leukemia. Trained as an immunologist

\* Commemorative remarks delivered at the symposium on Bioregulators of Reproduction.

he shifted to leukemia research in 1927. (There was no NIH at that time, and the shift was prompted by a then anonymous grant to Eugene Opie to study this disease.)

Within a few years of Roentgen's discovery of x-rays, two major occupational hazards had been discovered: induction of carcinoma on the exposed hands and leukemia. Jacob Furth used irradiation to induce leukemia in his experimental animals. However, remembering the advice of Eugene Opie, Jacob Furth did not terminate the experiment after the primary objective, the development of leukemia, had been attained but he maintained the surviving animals until "natural" death ensued. These studies led to the observation that a single exposure can trigger the development of a large number of neoplastic and non-neoplastic diseases (4,5).

Endocrine tumors so obtained were thoroughly studied. I will only cite one experiment which illustrates the use he made of these tumors. The MET.W15, a mammotropic pituitary tumor, was used to provide hormone to determine the responsiveness of various mammary tumors placed in organ cultures. It was observed that the hormone invariably stimulated DNA synthesis of hormone-responsiveness tumors and normal mammary glands but not of autonomous tumors (6).

He was over 70 when these experiments were done and it was for others to take these hormone-secreting tumors and put them in cell culture. It was for others to extend research on hormones and hormone-secreting tumors, research which is now at the point where a cloned cDNA coding for human growth hormone can be grown in a 750-liter culture (7).

As Jacob Furth pointed out in his autobiographical essay: "While progress in science sometimes results from the insight of a genius or from serendipity, more often it evolves from the toil of a vast number of investigators, each building upon another's contributions. Most of these investigators become casualties of progress, the stars of one era fade into oblivion in the light of the new knowledge in a new era" (8).

Jacob Furth possessed insight, profited from serendipity, and contributed a considerable number of building blocks to the edifice of science. His contributions to our understanding of normal and pathologic processes span six decades. He has many former students who have carried on his work, and many others who were inspired by him. Particularly worthy of note is one individual, Mark Furth, a grand-nephew, who will in a year or so return the name of Furth to the Faculty roster of Columbia University.

While we commemorate Jacob Furth we should not grieve, for he was fortunate in living a long life and to be active in the Golden Age of

American Science. He was fortunate in having a wife who, while pursuing a career of her own, was devoted to him. To his sons and to the children of his sons he was a loving father and grandfather. (The sons, when they were small, did not know that few fathers worked twelve-hour days and invariably talked shop to dinner guests.) That his sons continued in medical research was, although never expressed to them, a continuing source of satisfaction.

The star dies but the light goes on.

John J. Furth

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# Preface

The biological regulation of reproductive processes, in the context of this volume, has a history of some six decades. Thus, since the early 1920's, the field witnessed steady progress, until the 1970's saw a surge of advances in the biochemistry of the pituitary hormones, the releasing factors, and the receptors of these hormones. Explorations of binding proteins for androgens were successful, and investigations into the hormonal control of gene expression in reproductive tissues brought remarkable new insights.

With these and related advances as a background, a symposium on "Bioregulators of Reproduction" was held at Arden House, on the Harriman Campus of Columbia University, from June 6 through June 8, 1980. The meeting was the fifth of the P & S Biomedical Sciences Symposia. The proceedings are contained in this volume.

The participants were welcomed by Dr. Donald F. Tapley, Dean of the College of Physicians and Surgeons (P & S) which sponsors the symposia. Dr. Tapley spoke on the historical role of reproductive biology at P & S. The earliest textbook on obstetrics and gynecology in North America, "The Compendium of the Theory and Practice of Midwifery," containing a passage on ovarian structure, was published in 1807 by Dr. Samuel Bard, the first dean of this medical school.

Our sincere thanks go to Dr. Roger V. Short who delivered the Opening Address. The contributions of the session chairmen, Dr. Susumu Ohno, Dr. Paul E. Polani, Dr. Robert E. Canfield, Dr. Darrell N. Ward, and Dr. Short, are gratefully acknowledged. A session was also chaired by one of us (G. J.).

Several colleagues from P & S, Dr. William A. Blanc, Dr. Robert E. Canfield, Dr. Isidore S. Edelman, Dr. Andrew G. Frantz, Dr. Michael Katz, Dr. Seymour Lieberman, Dr. Ines Mandl, Dr. Orlando J. Miller, Dr. Ralph M. Richart, Dr. Richard A. Rifkind, Dr. Edward J. Sachar, and Dr. Raymond L. Vande Wiele, kindly agreed to serve as honorary hosts.

Dr. Ruth H. Vogel has made much appreciated contributions to the organization of the symposium and to the preparation of this volume.

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