

Fertilization of the Human Egg In Vitro

Biological Basis and Clinical Application

Edited by

Henning M. Beier and Hans R. Lindner



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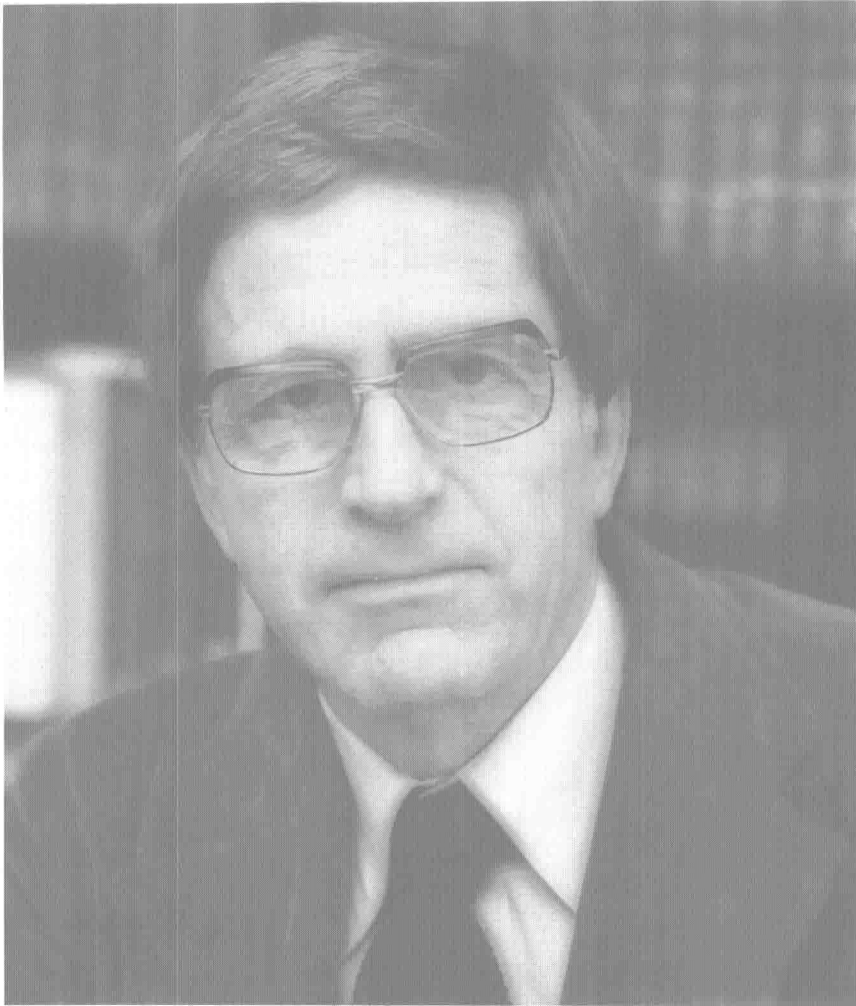
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In Memory of Hans R. Lindner

April 21, 1922–November 19, 1982

At the peak of his scientific career, Hans R. Lindner succumbed to a cruel disease, which he had fought for years with all his strength, determination, and courage. It is with deep respect and admiration that we regard his involvement in our symposium on "Fertilization of the Human Egg In Vitro", held at Murnau/Munich, the proceedings of which constitute this book. Participating in energetic discussions, he supported our

idea of having a meeting of scientists from both fields of research — those in basic and those in clinical human reproduction. In vitro fertilization and egg transfer, an exciting achievement in the therapy of human infertility, had already received remarkable worldwide attention; however, at this symposium the method met with excellent scientific criticism, to which the contributions of Hans Lindner were essential. What Hans wrote in an earlier grant application actually applies to our meeting: “Traditionally, the study of reproduction has been fragmented according to the primary discipline of the investigator, each viewing the subject through the conceptual framework of his own field. Yet only a synthesis of the results obtained by these varied approaches can lead to real understanding of the complexities of reproductive function, and perhaps to greater success in devising regulatory methods.”

Hans Lindner was born in Stettin, Germany. In 1936 he and his family felt forced to leave because of Nazi decrees, and emigrated to the Land of Israel, then Palestine. Here his formal education was interrupted by farm labor and duties in the *Haganah*. Hans attended the Mikve-Israel Agricultural School and specialized in animal husbandry (1938–1940). His interest in the reproductive sciences was awakened at Mikve-Israel, where he served as herdsman (1944–1947) and was involved in the introduction of artificial insemination.

After the War of Independence, Hans Lindner was given the opportunity of continuing his studies at Sydney University in Australia, graduating as a BVSc in 1954. In 1957, he was awarded the Commonwealth Scholarship for Advanced Studies and proceeded to King's College, Cambridge, for PhD studies which were supervised by Professor T. Mann, FRS. On his return to Australia (1961) he resumed duties in the Division of Animal Physiology of C.S.I.R.O., Sydney, responsible for the Steroid Hormone Research Section.

In 1964 Dr. Lindner received a Population Council Fellowship and was granted to leave from C.S.I.R.O. to spend a year in the Department of Biodynamics of the Weizmann Institute of Science. This initially short visit became a homecoming. In 1965 he was appointed Associate Professor and in 1967 succeeded Prof. M.C. Schelesnyak as Head of the Department of Biodynamics. In 1971 he was promoted to the rank of Professor, and in 1973 became simultaneously the first holder of the Adlai E. Stevenson III Chair of Endocrinology and Reproductive Physiology, and Chairman of the Department of Hormone Research. In Rehovot he set up a warm and most hospitable home with his wife Karin, and here his son Ari and daughter Anat were born.

Even Hans Lindner's initial studies, published mainly in the *Journal of Endocrinology* in the early 1960s, indicated the emergence of a highly original scientist. He combined, even at the outset of his career, original biological observations with a wealth of technical and surgical developments. His imaginative mind, administrative skills, and ability to attract capable and enthusiastic co-workers reached their full expression at the Department of Hormone Research of the Weizmann Institute.

The research team led by him has been in the forefront of current efforts to comprehend the endocrine control of ovarian function, including the hormonal regulation of follicular development and regression, the process of ovum maturation and ovulation, differentiation of the luteal cell, and luteolysis. This work combined in a unique way the approaches and methodologies of modern cell biology, biochemistry, and molecular biology, with emphasis on ultrastructural and mechanistic analysis. To assist

these studies and to serve the needs of clinical laboratories, novel assay methods of high specificity and sensitivity were developed. Beginning in 1967 one of us (A.T.) had the privilege of close association with Yohanan, as he was called in Hebrew by his close associates. Hans placed his full confidence in even junior members of the staff, thus allowing them the "expression of curiosity, individuality and imagination." Besides his scientific and administrative activities within the Department of Hormone Research, he devoted much of his time to academic duties at the Weizmann Institute. His unique scientific insight and knowledge, coupled with his awareness of clinical problems, led to his serving on the advisory boards of several national and international associations. Among these were the *World Health Organization*, *Institut National de la Sante et de la Recherche Medicale*, and the *Max Planck Gesellschaft*.

Hans Lindner's scientific contributions were widely recognized, and his honors and elections to prestigious societies are almost too numerous to mention. He was awarded the Hermann Zondek Prize for Endocrine and Metabolic Research (1972) and the DSc by Cambridge University (1977), and became *Korrespondierendes Mitglied der Deutschen Gesellschaft für Endokrinologie* (1978); he was elected member of the Israel Academy of Science and Humanities (1979), awarded Israel Prize for Life Sciences (1979) and the Rothschild Prize in Biology (1981), made MD (h.c.) by the University of Göteborg (1981), and given the Axel Munthe Award in the Field of Reproduction (1982).

Hans will be remembered for many of his virtues, not the least of which was his humility. Last June when the team he headed was awarded the Axel Munthe Award at Capri, he commented as follows: "We were helped by standing on the shoulders of giants who laid the foundations for the work we are doing now. Scientific inquiry is a continuum creating an ever more beautiful picture. To add a stone to this mosaic, or discern a new pattern in its design, can be a source of great satisfaction."

Hans Lindner will be sadly missed by his students, associates, and friends at the Weizmann Institute, and by members of the scientific community who had the privilege of being acquainted with him. We feel very fortunate to have shared in his inspiration and friendship.

Alex Tsafiriri and Henning M. Beier

Preface

The Organon Symposia have actually become a tradition, keeping up with exciting developments in reproductive medicine. The purpose of this symposium on "Fertilization of the Human Egg in Vitro" was to bring together the still limited number of clinical specialists in the field and to stimulate another group of basic research people to exchange their experiences and knowledge, hopefully promoting close cooperation between the two groups. It was a kind of scientific "first" that all research teams so far successful in achieving the birth of a healthy baby, fertilized in vitro came together at a workshop conference without a large audience of spectators and reporters, but with a small number of highly critical colleagues from the fields of basic reproductive physiology and comparative developmental biology. This atmosphere allowed for the close exchange of results, hypotheses, diagnostic and therapeutic procedures, criticism, and respect, and created very productive discussions, all of which furthered the aim of the method: To help more childless couples to have their own babies by the ultimate ratio procedure of in vitro fertilization and embryo replacement.

The book that has emerged from this symposium will help to disseminate the great amount of information and experience gathered among the scientifically and clinically interested colleagues of many other hospitals and universities who could not be invited to the meeting. At the same time, it will prove that there is much more work to be done in the basic and clinical sciences of human embryology and reproductive biology. The contributions to this book will demonstrate that physicians can build their clinical work more solidly on a sound platform of scientific knowledge than on treatment of patients only by trial and error.

The topics of our symposium sessions and contributions were intended to cover all relevant aspects of the field, including many detailed descriptions of therapeutic approaches. These in particular will be of great value to newly established teams in starting programs to introduce these procedures in their clinics. Perhaps other colleagues, who have hesitated to recognize the method of human in vitro fertilization as an achievement of science, will be able to understand everything much better after carefully reading all available information related to this challenging medical procedure.

Thanks are due to so many colleagues and friends for their help. On behalf of all participants I would like to express our appreciation to Organon, Oberschleißheim/München, and in particular to Dr. Günter Weiland for sponsoring and so elegantly organizing this symposium at Murnau. The staff of Organon, guided by Dr. Klaus-H. Geissler and Mrs. Gabriele Hinds did a perfect job, and the secretarial and editorial support of Mrs. Ria Becht, Department of Anatomy and Reproductive Biology, RWTH Aachen, were of invaluable help in all technical matters. Finally, sincere thanks are due the staff of the production department of Springer-Verlag, Heidelberg for their excellent work.

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