

HEMATOPOIETIC STEM CELL PHYSIOLOGY

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HEMATOPOIETIC STEM CELL PHYSIOLOGY

Proceedings of the Tenth Annual Frederick Stohlman, Jr.,
M.D. Memorial Symposium: An International Colloquium on
Stem Cell Physiology, held in Boston, October 1-5, 1984

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Alan R. Liss, Inc., 41 East 11th Street, New York, NY 10003**

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Printed in the United States of America

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Second Printing, February 1986

Library of Congress Cataloging in Publication Data

International Colloquium on Stem Cell Physiology
(1984: Boston, Mass.)
Hematopoietic stem cell physiology.

Includes index.

1. Hematopoietic stem cells—Congresses.
2. Stohlman, Frederick. I. Cronkite, Eugene P.
II. Stohlman, Frederick. [DNLN: 1. Hematopoietic Stem
Cells—physiology—congresses. W1 PR668E v. 128 /
WH 380 1605h 1984]
QP92.155 1984 6121'.11 85-7016
ISBN 0-8451-5034-0

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Preface

The introduction and development of clonal hematopoietic stem cell assays represented a major breakthrough in our capacity to examine the physiology of mammalian stem cells. Careful time-course analyses and growth factor deprivation experiments permitted characterization of stem cell populations previously not known to exist. Soon thereafter stem cell models or developmental hierarchies were constructed based upon the availability of this new phenomenological information. Dr. Frederick Stohlman, Jr., was instrumental in developing critical concepts during the formative years of this field. His clinical and laboratory observations regarding the presence of circulating regulators of erythropoietic cell turnover provided a physiological approach for investigators of his day. They laid the foundation for future generations of stem cell physiologists and workers in the field. Accordingly, many of the scientists trained by Dr. Stohlman subsequently developed active careers in the fields of erythropoiesis, granulopoiesis and megakaryocytopoiesis. Although his loss in a tragic plane crash over the Ionian Sea on September 8, 1974, is still keenly felt by the experimental hematology community, basic concepts and approaches that constitute his scientific legacy are alive and well.

The past decade has witnessed an explosion of new information addressing the molecular biology, immunobiology, regulatory physiology and membrane biochemistry of hematopoietic stem cells. New progenitor cell populations have been identified, new models of stem cell differentiation have been proposed, and new regulators of stem cell differentiation and growth have been characterized. Culture systems currently employed are undergoing careful scientific scrutiny as the field is developing toward defining molecular events that accompany stem cell differentiation and growth. It is logical to assume that understanding physiologic control mechanisms of hematopoiesis will provide insight regarding the regulation of malignant transformation.

The Tenth Annual Frederick Stohlman, Jr., M.D. Memorial Symposium: An International Colloquium on Stem Cell Physiology was organized to comprehensively review and examine much of this new data. Topics covered include models and mechanisms of stem cell differentiation, hematopoietic growth factors and regulators of stem cell differentiation, biochemical alterations of cell membranes during erythroid differentiation, genetic control of hematopoiesis, and growth and regulation of neoplastic hematopoietic cells. Its purpose was to identify potentially fertile areas of basic research in these various disciplines that may serve to guide future research endeavors. This volume contains the proceedings of the symposium. It is divided into seven main categories. The first reviews current models of normal and neoplastic stem cell organization. In the next three sections, humoral regulation of erythropoiesis, granulopoiesis and megakaryocytopoiesis are sequentially addressed. In a broad sense, limitations of progenitor cell assay systems, growth factor purification, lineage specificity or indifference and physiologic relevance are discussed. The fifth section re-

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views recent developments regarding regulation of hematopoiesis by cellular interactions and extracellular matrix components. In the sixth section, cell surface alterations occurring during hematopoietic cell development are highlighted. And in the last section, control mechanisms of abnormal and neoplastic cell growth are addressed. It is hoped that this volume will stimulate serious scientific thought and research in the field of stem cell physiology, much as the now classic monograph edited by Dr. Stohlman served to review one of the first international symposia on hematopoietic stem cells and to catalyze early development of the field.

The editors express their gratitude to Dr. Alan R. Levine (Blood Diseases Branch, Division of Blood Diseases and Resources) for his help in organizing the Symposium. They also are appreciative of the excellent secretarial and organizational assistance offered by Bernadette Stohlman-Trenholm, Carmen Gilmore, Donna MacDonald, Sandra Kreczko and Donald Howard.

The Editors

Acknowledgments

The Organizers of the Tenth Annual Frederick Stohlman, Jr., M.D. Memorial Symposium: An International Colloquium on Stem Cell Physiology gratefully acknowledge the following individuals, institutions, agencies, and companies for their generous and important support of this annual symposium:

Biogen Research Corporation
Mrs. Kathleen Butler
Coulter Electronics
Fogarty International Center
Genetics Institute
Leukemia Society of America
National Cancer Institute
National Heart, Lung and
Blood Institute
National Institute of Arthritis,
Diabetes, Digestive
and Kidney Diseases

QUIDEL
Roerig-Pfizer
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Seragen, Inc.
Serona Symposia USA
Tufts University School of Medicine
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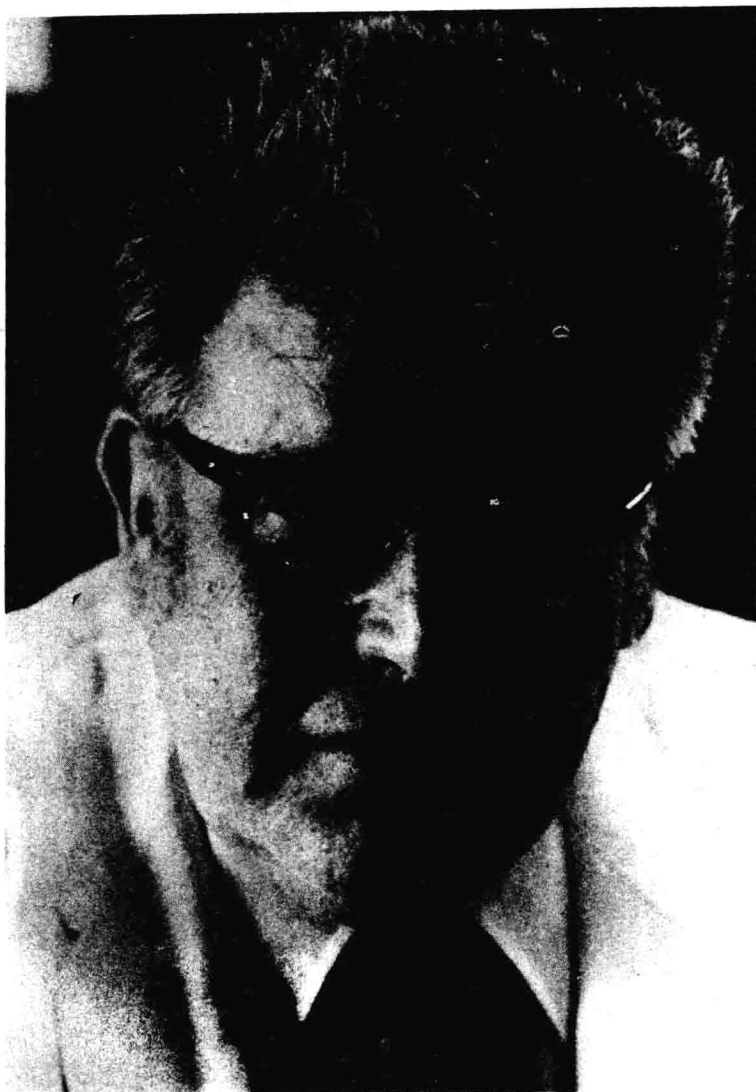
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CONFERENCE DEDICATION



**Frederick Stohlman Jr., M.D.
(1926-1974)**

FREDERICK STOHLMAN JR. (1926 - 1974)
PHYSICIAN, SCIENTIST, TEACHER, FRIEND.

George Brecher

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"He was a man of angel's wit and singular learning; I know not his fellows. For where is the man of that gentleness, lowliness, and affability? And as time requireth, a man of marvelous mirth and pastimes; and sometimes as sad a gravity; a man for all seasons."

It seems altogether appropriate that this description of a renaissance scholar, and statesman, Sir Thomas More, written in 1503, should fit Fred Stohlman. Fred was a renaissance man in today's sense of the word. It is the standard assignment of an academician to serve as a researcher, clinician, and teacher, but it is very rare indeed for anyone to achieve equal and outstanding success in all three of these disparate endeavors. Fred did and did so with ease and assurance. He had an unfailing sense of right and wrong and what was so. He saw what needed to be done and did it. Fred had an amazing capacity for work. Although he assumed a staggering number of responsibilities, each seemed to receive his full attention. As a clinician with a large practice, he neglected no detail. Each patient felt comforted by his care and compassion. A four year old with leukemia seeing him down the hall would say to her mother, "Here comes my big friend." In his research lab all fellows and students were assured of his personal direction and involvement in their particular project. The duties of the Editor of BLOOD might well have become Fred's major preoccupation since he took his editorial duties very seriously. Indeed BLOOD flourished under his guidance, becoming more broadly representative of all of hematology than before. Fred managed to absorb this additional task with a smile. Most welcome to his friends and family, Fred could always find time, in the midst of his endless engagements, to be the man of "marvelous mirth."

Sir James Gowans recalls that he once waxed effusively enthusiastic about a member of the fraternity when reporting to