SCIENTIFIC PROGRAM

NOTE: Numbers refer to Abstract or Poster No.

I. PLENARY LECTURES

MONDAY, JULY 28, 8:45 a.m.

1. The Rheology of Complex Networks
   SIR SAM F. EDWARDS, F.R.S. (Cambridge, England)

MONDAY, JULY 28, 2:00 p.m.

2. Strength and Specificity of Biomembrane Interaction
   V. ADRIAN PARSEGIAN (Bethesda, MD, U.S.A.)

TUESDAY, JULY 29, 8:30 a.m.

3. Morphology and Biochemistry of the Endothelial Cell
   ANNE P. AUTOR (Vancouver, BC, Canada)

TUESDAY, JULY 29, 9:15 a.m.

4. Transport in Living Plants
   MARTIN J. CANNY (Clayton, Victoria, Australia)

WEDNESDAY, JULY 30, 8:30 a.m.

5. Interactions Between Hemodynamic and Chemical Factors Causing Transient Ischemic Attacks and Strokes
   GUSTAV BORN, F.R.S. (London, England)

THURSDAY, JULY 31, 8:30 a.m.

6. Contribution of Actin and Actin/Associated Proteins to the Rheology of the "Gelatinous" Cortex of the Cell
   THOMAS STOSSEL (Boston, MA , U.S.A.)

FRIDAY, AUGUST 1, 8:30 a.m.

7. Hemorheological Aspects of Myocardial Infarction and Hypertension
   SHU CHIEN (New York, NY, U.S.A.)

II. SYMPOSIA

SYMPOSIUM #1 **CELLULAR AND MOLECULAR BASIS OF MUCUS RHEOLOGY**
(Organiser: P. Verdugo, Seattle, WA, U.S.A.)

PART I: MONDAY, JULY 28, 9:45 a.m. - 12.30 p.m. and 3:00 - 5:30 p.m.

8. Use of Monoclonal Antibodies and Cell Culture for Studies of Mucus Production.
   C. BASBAUM, S. FORSBERG, B. MACHER, A. PAUL and W. FINKBEINER

9. Fluid Transport by Tracheal Epithelium.
   J. H. WIDDICOMBE

10. Inflammation and Modulation of Secretion and Ion Transport in Airways.
    J. A. NADEL

11. Polymer Gel Phase Transition: The Molecular Mechanism of Product Storage and Release in Mucin Secretion.
    P. VERDUGO

12. Ca++-Control of Mucous Glycoprotein Assembly at the Biosynthetic Level.
    P. W. KENT

13. Macromolecular Properties and Polydispersity of Mucus Glycoproteins.
    I. CARLSTEDT and J. K. SHEEHAN

14. Diffusion of Charged Ions in Mucus Gel: Effect of Net Charge.
    S. P. LEE and J. F. NICHOLLS

15. The Structure and Properties of Gastrointestinal Mucus and Reconstituted Mucus Glycoprotein Gels.
    A. ALLEN, L. A. SELLERS, D. A. HUTTON and A. H. MALL

SYMPOSIUM #1 **CELLULAR AND MOLECULAR BASIS OF MUCUS RHEOLOGY** (continued)

PART II: TUESDAY, JULY 29, 10:15 a.m. - 12:30 p.m. and 2:00 - 5:30 p.m.

16. Transport of Mucus and Particles over Mucociliary Epithelia.
    A. SILBERBERG

17. Rheological Properties Controlling Mucociliary Frequency and Respiratory Mucus Transport.
    E. PUCHELLE, J. M. ZHAM and D. QUEMADA

18. Measurements of the Components of Respiratory Tract Mucus Transport.
    D. B. YEATES, L. B. WONG, P. A. EDWARDS, L. M. GRUENAUER and I. F. MILLER

19. Dynamic Light Scattering Methods for Biorheology.
    R. NOSSAL

20. Role of Mucus Viscoelasticity in Clearance by Cough.
    M. KING

21. Photoelectric Measurement of Phases Beating Cilia.
    Z. PRIEL and D. ESHEL

22. Cervical Mucus Rheology in Cystic Fibrosis.
    R. KELEMEN, D. HOLSCLAW and M. LITT

23. The Role of the Periciliary Fluid in Mucociliary Flows: Flow-Velocity Profiles in Frog Palate Mucus.
    H. WINET

24. Changes in Mucus-Like Secretory Products Upon Exocytosis in Unicellular Organisms.
    B. H. SATIR

25. Processes in Formation of Mucus by the Body Wall of a Terrestrial Slug Ariolimax Columbianus.
    I. DEYRUP-OLSEN and A. W. MARTIN

SYMPOSIUM #2 **PHYSICO-CHEMICAL ASPECTS OF CELLULAR INTERACTIONS**
MONDAY, JULY 28, 3:00 - 5:30 p.m.
(Organisers: D.E. Brooks, Vancouver, BC and H.L. Goldsmith, Montreal, Que, Canada)

26. Microrheological Techniques Applied to the Measurement of Intercellular Forces.

    H. L. GOLDSMITH and S. P. THA

27. Cell-Surface Structure and Cellular Interactions.

    D. E. BROOKS and J. F. BOYCE

28. A Scaling Theory for Adhesion of Membrane Surfaces Induced by Equilibrium Adsorption of Large Polymers.

    E. EVANS

29. The Role of Electrostatic Interactions in Red Blood Cell Aggregation Phenomena.

    P. SNABRE and P. MILLS

30. Electrostatic Properties of the Red Cell Membrane and Their Influence Upon Shape and Aggregation.

    D. LERCHE

SYMPOSIUM #3 **BLOOD FLOW, ATHEROGENESIS AND THROMBOGENESIS**
TUESDAY, JULY 29, 10:15 a.m. - 12:30 p.m. and 2:00 - 5:30 p.m.
(Organisers: H.L. Goldsmith and T. Karino, Montreal, Canada)

31. Role of Endothelial Integrity and Injury in Atherogenesis.
M. A. REIDY

32. Lipoprotein Transport Across the Endothelium and its Possible Relationship to Atherogenesis.
S. WEINBAUM, R. PFEFFER and S. CHIEN

33. Endothelial Responses to Shear Stress: Mechanisms in Atherogenesis.
C. J. SCHWARTZ, R. M. NEREM, E. A. SPRAGUE, M. J. LEVESQUE and B. L. STEINBACH

34. Structural and Function Responses of Vascular Endothelial Cells to Shear Flow In Vitro.
P. F. DAVIES, M. A. GIMBRONE, Jr., E. J. GORDON, A. REMUZZI and C. F. DEWEY, Jr.

35. The Role of Platelets in Thrombosis and Atherosclerosis.
R. L. KINLOUGH-RATHBONE and J. F. MUSTARD

36. Platelet Deposition on the Vessel Wall: Interactions Between Biochemical and Rheological Factors.
G. V. R. BORN

37. Influence of Vasoactive Agents on Arterial Hemodynamics: Possible Relevance to Atherogenesis.
C. G. CARO, P. J. FISH, M. JAY, M. J. LEVER, D. F. MOORE and K. H. PARKER

38. Localization of Atherosclerosis in Man.
S. GLAGOV, C. K. ZARINS, D. GIDDENS, D. N. KU and P. A. BEERE

39. Flow Patterns and Localization of Thrombosis and Atherosclerosis.
T. KARINO, M. MOTOMIYA, Y. SOHARA and S. MABUCHI

SYMPOSIUM #4 **TRANSPORT OF WATER AND ASSIMILATES IN PLANTS**
TUESDAY, JULY 29, 10:15 a.m. - 12:30 p.m.
(Organiser: A. Jeje, Calgary, Alberta, Canada)

40. The Form and Function of the Xylem.
J. S. SPERRY

41. Long Distance Assimilate Transport and Water Flow in Plants.
J. FERRIER

42. Plant Cell Membranes and Cellular Transfer Processes.
A. LÄUCHLI

43. The Hydraulic Conductivity of Fresh Wood: An Anisotropic, Swelling, Elasticoviscous Porous Medium.
A. JEJE

43A. Tracing the Path of Transpiration in Leaves by means of Fluorescent Apoplastic Dyes, Stabilised for Microscopy by Freeze-Substitution
M. J. CANNY

SYMPOSIUM #5 **INTERACTIONS OF CANCER CELLS WITH THE MICROVASCULATURE**
TUESDAY, JULY 29, 2:00 - 5:30 p.m.
(Organiser: L. Weiss, Buffalo, NY, U.S.A.)

44. Interactions of Cancer Cells with the Microvasculature: Introduction.
L. WEISS

45. Biochemical Aspects of Cell Migration and Invasion.
A. D. RECKLIES

46. The Hemodynamic Destruction of Circulation Cancer Cells.
L. WEISS

47. Dynamics of Cancer Cell Interactions with the Microvasculature: Intravital Microscopic Studies.
R. K. JAIN and K. WARD-HARTLEY

48. Platelet-Tumor Cell-Endothelial Cell Interactions: Role in Metastasis.
K. V. HONN, D. G. MENTER, P. G. CAVANAUGH, J. D. TAYLOR and B. F. SLOANE

49. Interaction of Granulocytes with the Microvasculature.
G. W. SCHMID-SCHÖNBEIN

SYMPOSIUM #6 **HEMORHEOLOGICAL ASPECTS OF STROKE**
WEDNESDAY, JULY 30, 9:30 a.m. - 12:30 p.m.
(Organiser: G. Seaman, Portland, OR, U.S.A.)

50. Carotid Blood Flow and the Multidirectional Shear Stress Atherogenesis Model.

D. E. McMILLAN

51. Surface Electrochemistry and Stroke.

G. V. F. SEAMAN, B. M. COULL and R. J. KNOX

52. Differentiation of Red Cell and Plasmatic Factors in Stroke.

B. M. COULL, N. B. BEAMER, F. J. NORDT, Y. J. TAN and G. V. F. SEAMAN

53. Prospective Study of Rheological and Hemostatic Variables in Acute Stroke.

G. D. O. LOWE, J. ANDERSON, J. T. DOUGLAS, J. C. BARBENEL and C. D. FORBES

54. Coagulation and Hemorheology in Cerebral Ischemia.

M. FISHER AND H. J. MEISELMAN

55. Microcirculatory and Hemorheological Aspects of the Pathophysiology of Cerebral Ischemia.

P. GAEHTGENS and P. MARX

56. Dissociation of Plasma Flow from the Erythrocyte Flow in Ischemic Brain.

K. KOGURE, M. IZUMIYAMA, M. TOBITA, J. TANAKA, M. TAKANO and T. IDO

57. Rheoactive Drugs in Stroke: Rationale.

M. J. G. HARRISON

58. Modulation of Calcium Mediated Effects in the Red Blood Cell By Rheoactive Drugs.

F. J. NORDT

59. Hemorheological Modification in Stroke: Pharmacological Consequences.

J. F. STOLTZ

SYMPOSIUM #7 **RHEOLOGY OF ACTIVE AND PASSIVE CYTOSKELETAL NETWORKS**
THURSDAY, JULY 31, 9:30 a.m. - 12:30 p.m. and 2:00 - 5:00 p.m.
(Organiser: E. Evans, Vancouver, BC, Canada)

60. The Mechanical Properties of Purified Cytoskeletal Proteins.
K. S. ZANER

61. Rheology of Living Cytoplasm and Cell Proteins.
M. SATO

62. Mechanics of Plasma Membrane-Cortical Network Composite: Rheological Model for Blood Phagocytes.
E. EVANS and A. YEUNG

63. Mobility of Phagocytized Particles Within Living Cells: A Measure of Cytoplasmic Motion and Apparent Viscosity.
P. A. VALBERG

64. Continuum Mechanics Simulation of Pseudopod Formation.
R. SKALAK, C. DONG, C. ZHU, P. SUNG and S. CHIEN

65. Fluid Mechanics of Contractile Flows.
M. DEMBO

66. Regulation of Red Cell Membrane Deformability and Stability by Skeletal Protein Network.
N. MOHANDAS

67. Experimental Rheology of Red Cell Membrane and its Cytoskeleton.
R. E. WAUGH

68. Physical Chemistry of the Red Cell Cytoskeleton: The Spectrin Network.
A. MIKKELSEN, B. T. STOKKE and E. ELGSAETER

69. Rheology of <u>In Vitro</u> Preparations of Red Cell Cytoskeletal Components.
B. T. STOKKE

SYMPOSIUM #8 **CURRENT DEVELOPMENTS IN CLINICAL HEMORHEOLOGY**
FRIDAY, AUGUST 1, 9:30 a.m. - 12:30 p.m.
(Organisers: G.D.O. Lowe (Glasgow, Scotland) and H.J. Meiselman, Los Angeles, CA, U.S.A.)

70. Hemorheology and Peripheral Arterial Diseases.
S. FORCONI, M. GUERRINI and T. DI PERRI

71. Stress Polycythemia.
J. P. ISBISTER

72. Haemorheology and Retinal Disorders.
G. D. O. LOWE, C. D. FORBES and W. S. FOULDS

73. Cellular Rheology of Sickle Cell Disease.
G. B. NASH and H. J. MEISELMAN

74. Limits and Potentials of Clinical Methods Assessing Blood Rheology In Vitro and In Vivo.
H. SCHMID-SCHÖNBEIN

75. Erythrocyte Rheology in Diabetes Mellitus.
J. STUART and I. JUHAN-VAGUE

SYMPOSIUM #9 **MOLECULAR BIORHEOLOGY**
FRIDAY, AUGUST 1, 9:30 - 11:30 a.m.
(Organiser: S. Chien New York, NY, U.S.A.)

76. Diagnostic and Therapeutic Applications of Antiplatelet Monoclonal Antibodies.
B. S. COLLER

77. Molecular Biology of Gelsolin, a Calcium-Regulated Actin Filament Severing Protein.
H. L. YIN, D. J. KWIATKOWSKY, C. CHAPONNIER and P. A. JANMEY

78. Molecular Cloning and Characterization of the Gene Coding for Red Cell Membrane Skeletal Protein 4.1.
J. G. CONBOY

III. FREE COMMUNICATIONS

MONDAY, JULY 28

A. **Physiological Fluid Dynamics: I.**

9:45 a.m. - 12:15 p.m.
Abstracts 79 - 88

B. **Physiological Fluid Dynamics: II**

3:00 - 4:30 p.m.
Abstracts 89 -94

C. **Platelets and Endothelial Cells**

9:45 a.m. - 12:00 noon
Abstracts 95 - 103

D. **Rheology of Red Cell Suspensions: I**

9:45 a.m. - 12:30 p.m.
Abstracts 104 - 114

E. **Rheology of Red Cell Suspensions: II**

3:00 - 4:45 p.m.
Abstracts 115 - 121

TUESDAY, JULY 29

F. **Red Cell Filtration**

10:15 a.m. - 12:30 p.m.
Abstracts 122 - 130

G. **Red Cell Aggregation and Deformation**

1:30 - 5:00 p.m.
Abstracts 122 - 144

WEDNESDAY, JULY 30

H. **Mucus Rheology and Transport**

9:30 - 11:00 a.m.
Abstracts 145 - 150

I. **Red Cell Membrane**

9:30 a.m. - 12:30 p.m.
Abstracts 151 - 162

POISEUILLE MEDAL AWARD CEREMONY AND LECTURE

1:30 - 2:30 p.m.

THURSDAY, JULY 31

J. **Clinical Hemorheology: I**

9:30 a.m. - 12:30 p.m.
Abstracts 163 - 174

K. **Clinical Hemorheology: II**

2:00 - 3:15 p.m.
Abstracts 175 - 179

L. **Vessels and Tissues**

9:30 a.m. - 12:30 p.m.
Abstracts 180 - 191

M. **Fluids and Microcirculation**

2:00 - 4:30 p.m.
Abstracts 192 - 201

FRIDAY, AUGUST 1

N. **Cell Suspension and Emulsion Rheology: Theory and Methods**

9:30 - 11:30 a.m.
Abstracts 202 - 210

O. **Leukocytes**

11:45 a.m. - 12:30 p.m.
Abstracts 211 - 213

IV: POSTERS

EXHIBITION: MONDAY AFTERNOON, JULY 28 TO WEDNESDAY NOON, JULY 30
DISCUSSION PERIOD: MONDAY, 4:30 - 5:30 p.m.

Rheology of Red Cell Suspensions

Posters 1 - 6

Leukocytes

Posters 7 - 9

Methods

Posters 11 and 12

Red Cell Aggregation, Deformation and Red Cell Membrane

Posters 10, 13 - 16

EXHIBITION: THURSDAY MORNING, JULY 31 TO FRIDAY NOON, AUGUST 1
DISCUSSION PERIOD: THURSDAY, 4:30 - 5:30 p.m.

Clinical Hemorheology

Posters 17 - 22

Miscellaneous

Posters 23 - 27