

An Official Journal of the American Heart Association

Circulation Research provides a medium for bringing together basic research on the cardiovascular system from various disciplines including biology, biochemistry, biophysics, morphology, pathology, physiology, and pharmacology. The Journal also will accept for publication manuscripts on clinical research that contribute to an understanding of fundamental problems.

Editor

FRANCOIS M. ABBOUD

Associate Editors

MICHAEL J. BRODY, DONALD D. HEISTAD, ALLYN L. MARK

Editorial Office: The Cardiovascular Center, University of Iowa College of Medicine, Iowa City, Iowa 52242

EDITORIAL BOARD

NORMAN R. ALPERT
MORTON F. ARNSDORF
ROBERT J. BACHE
JOHN C. BAILEY
VERNON S. BISHOP
F. NORMAN BRIGGS
KENNETH L. BRIGHAM
ARTHUR M. BROWN
MARY JO BURGESS
NEIL S. CHERNIACK
HAZEL M. COLERIDGE
JOHN C. G. COLERIDGE
PETER B. CORR
PAUL F. CRANEFIELD
PETER DANILO, JR.
JOHN N. DIANA
GERALD F. DiBONA
JAMES M. DOWNEY
S. EVANS DOWNING
ERIC O. FEIGL
VICTOR J. FERRANS
CARLOS M. FERRARIO
GREGORY R. FERRIER
LINCOLN E. FORD
HARRY A. FOZZARD
GERARD L. GEBBER
COLIN GIBBS

WAYNE R. GILES
JOSEPH P. GILMORE
STANTON A. GLANTZ
ROBERT W. GORE
K. LANCE GOULD
HARRIS J. GRAND
JARED J. GRANTHAM
JOSEPH C. GREENFIELD, JR.
DOUGLAS M. GRIGGS, JR.
EDGAR HABER
WILLIAM HALPERN
BURT B. HAMRELL
JOEL G. HARDMAN
PHILIP D. HENRY
R. KENT HERMSMEYER
JULIEN I.E. HOFFMAN
NORMAN K. HOLLENBERG
WILLIAM B. HOOD, JR.
REX L. JAMISON
BÖRJE JOHANSSON
PAUL C. JOHNSON
BERTRAM G. KATZUNG
EDWARD S. KIRK
FRANCIS J. KLOCKE
FRANKLYN G. KNOX
JUHA P. KOKKO
HERMES A. KONTOS
MELVIN L. MARCUS

ISRAEL MIRSKY
M. J. MULVANY
RICHARD A. MURPHY
ACHILLES PAPPANO
MICHAEL J. PEACH
GERALD H. POLLACK
KEITH A. REIMER
DONALD J. REIS
MICHAEL J. ROVETTO
LORING B. ROWELL
HAROLD SANDLER
PHILLIP G. SCHMID
SIDNEY S. SCHREIBER
RICHARD SKALAK
R. JOHN SOLARO
ANDREW P. SOMLYO
HARVEY V. SPARKS, JR.
NORMAN C. STAUB
HAROLD C. STRAUSS
MARC D. THAMES
PAUL M. VANHOUTTE
STEPHEN F. VATNER
AUGUST M. WATANABE
HARVEY WOLINSKY
RADOVAN ZAK
BEN G. ZIMMERMAN
BENJAMIN W. ZWEIFACH

ROBERT M. BERNE, BRIAN F. HOFFMAN, MATTHEW N. LEVY, HOWARD E. MORGAN, JOHN T. SHEPHERD,
Consulting Editors
LYNNE CANNON, *Managing Editor*

PUBLICATIONS COMMITTEE, AMERICAN HEART ASSOCIATION

ROBERT M. BERNE, *Chairman*
Charlottesville, VA

FRANCOIS M. ABBOUD
Iowa City, IA
JOHN T. BAKER
Chicago, IL
H. J. M. BARNETT
Ontario, Canada
EDWIN L. BIERMAN
Seattle, WA
JOHN R. BLINKS
Rochester, MN

FREDERICK BOWES, III
Boston, MA
GRACE E. BROWN
Madison, WI
MARY JO BURGESS
Salt Lake City, UT
MELVIN D. CHEITLIN
San Francisco, CA
HARRIET P. DUSTAN
Birmingham, AL

ANTONIO M. GOTTO, JR.
Houston, TX
THOMAS P. GRAHAM, JR.
Nashville, TN
DONALD HARRISON
Stanford, CA
FRANK I. MARCUS
Tucson, AZ
ALLYN L. MARK
Iowa City, IA

ALBERT J. MILLER
Chicago, IL
BURTON E. SOBEL
St. Louis, MO
THOMAS W. SMITH
Boston, MA
FRANK M. YATSU
Portland, OR