

**Smith-Waterman
at your fingertips.
Supercomputer
speed on your
desktop.
And it's
affordable.
Very.**

Introducing the only genetics supercomputing PC. Given the exponential growth of database size, scalable computing at the best price-performance is critical to your lab's continued success. DeCypher II TCP/IP network servers expand over 100x and are orders of magnitude faster than your UNIX workstation. Considering what you're now spending on sequencing, your data deserve the most sensitive search algorithm available, made affordable for the first time. Enhance your opportunity for discovery today... and tomorrow.

**Sequencing is Nothing...
Without Discovery**

DeCypher II

**CHECK OUR WEB SITE FOR
OUR TRADE SHOW SCHEDULE**



TIME LOGIC, INC.

Phone: 702.833.0200

Fax: 702.833.1222

E-mail: jiml@timelogic.com

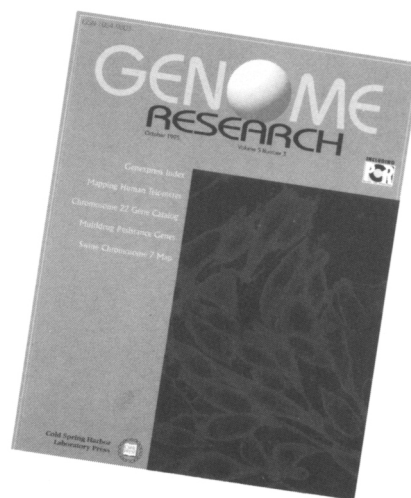
Web Site: <http://www.timelogic.com>

567 Knotty Pine Dr., Incline Village, NV 89451

Xilinx® reconfigurable logic arrays run new algorithms without hardware obsolescence. Time Logic has openings in bioinformatics/engineering at our Lake Tahoe facility, and is seeking domestic and international representation.

WHERE IS *GENOME RESEARCH* ABSTRACTED AND/OR INDEXED?

Cambridge Scientific Abstracts
Chemical Abstracts
Current Awareness in Biological Sciences
Current Contents/Life Sciences
Excerpta Medica/EMBASE
Index Medicus/MEDLINE
ISI/Biotechnology Citation Index
Reference Update
Science Citation Index



Reader Service No. 288

Editorial office: Cold Spring Harbor Laboratory Press, 1 Bungtown Road, Cold Spring Harbor, New York 11724-2203. Phone 516-367-8492; FAX 516-367-8334.

GENOME RESEARCH (ISSN 1088-9051) is published monthly for \$545 (U.S. institutional; \$597 R.O.W.), \$98 (individual making personal payment; \$150 R.O.W., includes airlift) by Cold Spring Harbor Laboratory Press, 1 Bungtown Road, Cold Spring Harbor, New York 11724. Periodicals postage pending is paid at Cold Spring Harbor and additional mailing offices. POSTMASTER: Send address changes to Cold Spring Harbor Laboratory, 10 Skyline Drive, Plainview, New York 11803-2500.

Subscriptions: Barbara Terry, Subscription

Manager. Personal: U.S. \$98; R.O.W. \$150 (includes airlift). Institutional: U.S. \$545; R.O.W. \$597 (includes airlift). Orders may be sent to Cold Spring Harbor Laboratory Press, Fulfillment Department, 10 Skyline Drive, Plainview, New York 11803-2500. Telephone: Continental U.S. and Canada 1-800-843-4388; all other locations 516-349-1930. FAX 516-349-1946. Personal subscriptions must be prepaid by personal check, credit card, or money order. Claims for missing issues must be received within 4 months of issue date.

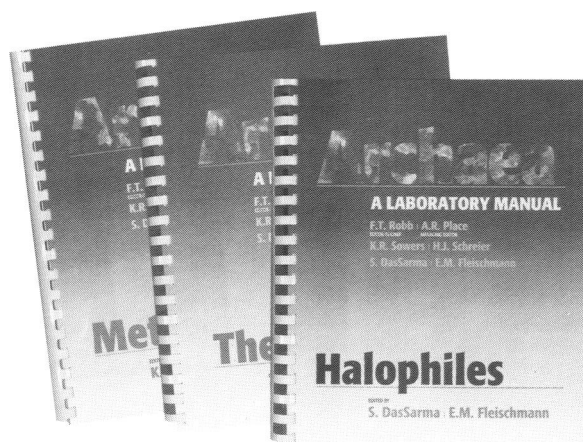
Advertising: Marcie Ebenstein, Advertising Manager, Cold Spring Harbor Laboratory Press, 1 Bungtown Road, Cold Spring Harbor, New York 11724-2203. Phone: 516-367-8351; FAX 516-367-8334.

Copyright information: Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Cold Spring Harbor Laboratory Press for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$5.00 per copy is paid directly to CCC, 21 Congress Street, Salem, Massachusetts 01970 (1054-9803/97 + \$5.00). This consent does not extend to other kinds of copying, such as copying for general distribution for advertising or promotional purposes, for creating new collective works, or for resale.

Copyright © 1997 by Cold Spring Harbor Laboratory Press



Cold Spring Harbor Laboratory Press



Archaea: A Laboratory Manual

Edited by Frank T. Robb (Editor in Chief), *University of Maryland Biotechnology Institute*, and Allen R. Place (Managing Editor), *University of Maryland Biotechnology Institute*; Kevin R. Sowers, *University of Maryland Biotechnology Institute*, and Harold J. Schreier, *University of Maryland Biotechnology Institute and University of Maryland, Baltimore County*; Shiladitya DasSarma, *University of Massachusetts at Amherst*, and Esther M. Fleischmann, *University of Maryland, Baltimore County*
Foreword by Carl R. Woese, *University of Illinois*

Although the Archaea are prokaryotes, like eukaryotes they have transcription signals, transcription factors, chaperones, and histones. They have evolved strategies for survival in extreme environments such as high temperature, high salt, and strictly anaerobic conditions. These unique adaptations have stimulated interest in the fields such as genetic variability, genome evolution, and PCR technology, and aspects of biotechnology such as methanogenesis and anaerobic bioremediation.

Investigators, especially newcomers, who wish to study the Archaea have lacked a comprehensive source for the specialized techniques required. The protocols in these three books are selected to provide a detailed guide to experiments with the methanogenic, extremely halophilic, and thermophilic sulfur-utilizing Archaea, with overviews to high-light areas of future development. These volumes are concise, complete resources for scientists already engaged or interested in research on the Archaea.

Halophiles

Edited by Shiladitya DasSarma, *University of Massachusetts at Amherst*; Esther M. Fleischmann, *University of Maryland, Baltimore County*
Foreword by Carl R. Woese, *University of Illinois*

--Here's what the reviewers have to say:

"This is one of a set of three manuals that attempts to encompass all aspects of the techniques current in archaeal research. The aim is to encourage research, both to gain fundamental knowledge and exploit the biotechnological possibilities.

The protocols range from two-page affairs that outline how to purify a specific enzyme, to long, extremely detailed general accounts of topics such as RNA transcript analysis and total lipid screening procedures. These are all well-written, logically laid out and easy to follow.

For any archaeal halophilologist, this manual is a must."

—*Society for General Microbiology Quarterly*

1995, 280 pp., illus., color plates, appendices, index
Plastic comb binding \$65
ISBN 0-87969-438-6

Methanogens

Edited by Kevin R. Sowers, *University of Maryland Biotechnology Institute*; Harold J. Schreier, *University of Maryland Biotechnology Institute and University of Maryland, Baltimore County*
Foreword by Carl R. Woese, *University of Illinois*

1995, 540 pp., illus., color plates, appendices, index
Plastic comb binding \$95
ISBN 0-87969-439-4

Thermophiles

Edited by Frank T. Robb, *University of Maryland Biotechnology Institute*; Allen R. Place, *University of Maryland Biotechnology Institute*
Foreword by Carl R. Woese, *University of Illinois*

1995, 217 pp., illus., color plates, appendices, index
Plastic comb binding \$65
ISBN 0-87969-440-8

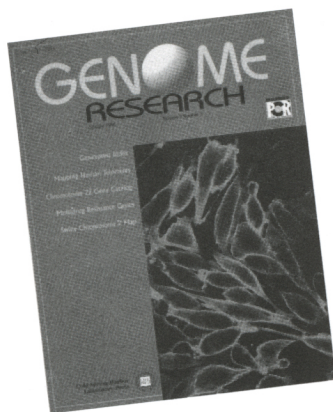
Also available in a cloth-bound edition containing all three books:

1995, 1037 pp., illus., color plates ISBN 0-87969-397-5
appendices, indexes
Cloth \$375

To order, or request additional information

Call: 1-800-843-4388 (Continental U.S. and Canada) 516-349-1930 (All other locations)
FAX: 516-349-1946
E-MAIL: cshpress@cshl.org or World Wide Web Site <http://www.cshl.org/>
Write: CSHL Press, 10 Skyline Drive, Plainview, NY 11803-2500





ORDER FORM

GENOME RESEARCH

ISSN 1088-9051

VOLUME 7, 1997, MONTHLY (containing 12 issues)

- ☐ Individual price (U.S.) - \$98
- ☐ Individual price (R.O.W.* Airlift Delivery) - \$150
- ☐ Student price (U.S.) - \$74.00
- ☐ Student price (R.O.W.* Airlift Delivery) - \$126.00
- ☐ Institutional price (U.S.) - \$545
- ☐ Institutional price (R.O.W.* Airlift Delivery) - \$597
- ☐ Please send me a sample issue

*R.O.W. = Rest of world

Personal orders must be prepaid by personal check, credit card or money order.

☐ Check or money order enclosed (U.S. Bank Checks Only)

Charge to: ☐ MASTERCARD ☐ VISA ☐ AMERICAN EXPRESS ☐ DISCOVER

ACCOUNT NO. _____ EXP. _____

SIGNATURE _____ TEL. _____

NAME _____ FAX _____

ADDRESS _____

CITY/STATE/ZIP/COUNTRY _____

Please check title(s) that most closely describe(s) your position:
(Please check one)

- ☐ (1) Professor
- ☐ (2) Graduate student
- ☐ (3) Postdoctoral scientist
- ☐ (4) Lab director
- ☐ (5) Lab technician
- ☐ (6) Medical student
- ☐ (7) Undergraduate student
- ☐ (8) Librarian
- ☐ (9) Publisher
- ☐ (10) Research associate
- ☐ (17) Principal investigator
- ☐ (19) M.D.
- ☐ (29) Purchasing agent/buyer
- ☐ (99) Other

Please check your employment category:
(Please check one)

- ☐ (1) University/college
- ☐ (2) Research institute/foundation
- ☐ (3) Hospital

- ☐ (4) Medical school
- ☐ (5) Industry
- ☐ (6) Government
- ☐ (7) Library/information center

Please check your primary field of interest:
(Please check one)

- ☐ (1) Biochemistry
- ☐ (2) Cell biology
- ☐ (3) Developmental biology
- ☐ (4) Epidemiology
- ☐ (5) Genetics
- ☐ (6) Immunology
- ☐ (7) Microbiology
- ☐ (8) Molecular biology
- ☐ (9) Neurobiology
- ☐ (10) Plant biology
- ☐ (11) Pharmacology
- ☐ (12) Virology
- ☐ (13) Oncology
- ☐ (33) Protein chemistry
- ☐ (34) Veterinary medicine
- ☐ (99) Other

Please indicate your areas of interest and techniques you use in your research
(Check all that apply)

- MOLECULAR BIOLOGY**
- ☐ (1) Autoradiography
- ☐ (2) cDNA synthesis
- ☐ (3) Cloning
- ☐ (4) DNA footprinting
- ☐ (5) DNA purification
- ☐ (6) Electroporation
- ☐ (7) Eukaryotic expression
- ☐ (8) Genomic mapping and screening
- ☐ (9) In situ hybridization
- ☐ (10) In vitro transcription
- ☐ (11) In vitro translation
- ☐ (12) Library screening
- ☐ (13) Mutagenesis
- ☐ (14) Nonisotopic labeling and detection
- ☐ (15) Nucleic acid electrophoresis
- ☐ (16) Nucleic acid radiolabeling
- ☐ (17) Nucleic acid sequencing
- ☐ (18) Nucleic acid synthesis

- ☐ (19) PCR
- ☐ (20) Prokaryotic expression
- ☐ (22) Pulsed field electrophoresis
- ☐ (23) RNA analysis
- ☐ (24) RNA purification
- ☐ (25) Software-aided sequence analysis

PROTEIN CHEMISTRY

- ☐ (30) Amino acid analysis
- ☐ (31) Chromatography
- ☐ (32) Affinity
- ☐ (33) Gas
- ☐ (34) HPLC
- ☐ (35) Thin layer
- ☐ (36) Electrophoresis of proteins
- ☐ (37) Glycoprotein analysis
- ☐ (38) Peptide mapping
- ☐ (39) Peptide synthesis
- ☐ (40) Protein kinase assays
- ☐ (42) Protein purification
- ☐ (43) Protein sequencing

IMMUNOLOGY

- ☐ (50) Antibody labeling
- ☐ (51) Antibody purification
- ☐ (52) Ascites production
- ☐ (53) ELISA
- ☐ (54) Flow cytometry
- ☐ (55) Hybridoma production
- ☐ (56) Immunohistochemistry
- ☐ (57) Immunoprecipitation
- ☐ (58) RIA
- ☐ (59) Western blotting

CELL BIOLOGY

- ☐ (70) Apoptosis
- ☐ (71) Cell proliferation
- ☐ (72) ES cell culture
- ☐ (73) Growth factors/cytokines
- ☐ (74) Insect cell culture
- ☐ (75) Mammalian cell culture
- ☐ (76) Microscopy
- ☐ (77) Plant cell culture
- ☐ (78) Receptor studies
- ☐ (79) Serum-free cell culture

TEL: Continental U.S. and Canada: 1-800-843-4388 All other locations: 516-349-1930 FAX: 516-349-1946

All prices subject to change without notice.

Orders for Japan: Maruzen Company Ltd., 3 - 10, Nihonbashi 2-Chome, Chuo-ku, Tokyo 103, Japan. **Orders for India, Pakistan, Bangladesh, Sri Lanka, and Nepal:** Narosa Book Distributors Private Limited, 6 Community Centre, Panchsheel Park, New Delhi 110 017, India.

GENOME RESEARCH

GENOME RESEARCH

ISSN 1088-9051

VOLUME 7, 1997, MONTHLY (containing 12 issues)

- ☐ Individual price (U.S.) - \$98
- ☐ Individual price (R.O.W.* Airlift Delivery) - \$150
- ☐ Student price (U.S.) - \$74.00
- ☐ Student price (R.O.W.* Airlift Delivery) - \$126.00
- ☐ Institutional price (U.S.) - \$545
- ☐ Institutional price (R.O.W.* Airlift Delivery) - \$597
- ☐ Please send me a sample issue

*R.O.W. = Rest of world

Personal orders must be prepaid by personal check, credit card or money order.

☐ Check or money order enclosed (U.S. Bank Checks Only)

Charge to: ☐ MASTERCARD ☐ VISA ☐ AMERICAN EXPRESS ☐ DISCOVER

ACCOUNT NO. _____ EXP. _____

SIGNATURE _____ TEL. _____

NAME _____ FAX _____

ADDRESS _____

CITY/STATE/ZIP/COUNTRY _____

Please check title(s) that most closely describe(s) your position:
(Please check one)

- ☐ (1) Professor
- ☐ (2) Graduate student
- ☐ (3) Postdoctoral scientist
- ☐ (4) Lab director
- ☐ (5) Lab technician
- ☐ (6) Medical student
- ☐ (7) Undergraduate student
- ☐ (8) Librarian
- ☐ (9) Publisher
- ☐ (10) Research associate
- ☐ (17) Principal investigator
- ☐ (19) M.D.
- ☐ (29) Purchasing agent/buyer
- ☐ (99) Other

Please check your employment category:
(Please check one)

- ☐ (1) University/college
- ☐ (2) Research institute/foundation
- ☐ (3) Hospital

- ☐ (4) Medical school
- ☐ (5) Industry
- ☐ (6) Government
- ☐ (7) Library/information center

Please check your primary field of interest:
(Please check one)

- ☐ (1) Biochemistry
- ☐ (2) Cell biology
- ☐ (3) Developmental biology
- ☐ (4) Epidemiology
- ☐ (5) Genetics
- ☐ (6) Immunology
- ☐ (7) Microbiology
- ☐ (8) Molecular biology
- ☐ (9) Neurobiology
- ☐ (10) Plant biology
- ☐ (11) Pharmacology
- ☐ (12) Virology
- ☐ (13) Oncology
- ☐ (33) Protein chemistry
- ☐ (34) Veterinary medicine
- ☐ (99) Other

Please indicate your areas of interest and techniques you use in your research
(Check all that apply)

- MOLECULAR BIOLOGY**
- ☐ (1) Autoradiography
- ☐ (2) cDNA synthesis
- ☐ (3) Cloning
- ☐ (4) DNA footprinting
- ☐ (5) DNA purification
- ☐ (6) Electroporation
- ☐ (7) Eukaryotic expression
- ☐ (8) Genomic mapping and screening
- ☐ (9) In situ hybridization
- ☐ (10) In vitro transcription
- ☐ (11) In vitro translation
- ☐ (12) Library screening
- ☐ (13) Mutagenesis
- ☐ (14) Nonisotopic labeling and detection
- ☐ (15) Nucleic acid electrophoresis
- ☐ (16) Nucleic acid radiolabeling
- ☐ (17) Nucleic acid sequencing
- ☐ (18) Nucleic acid synthesis

- ☐ (19) PCR
- ☐ (20) Prokaryotic expression
- ☐ (22) Pulsed field electrophoresis
- ☐ (23) RNA analysis
- ☐ (24) RNA purification
- ☐ (25) Software-aided sequence analysis

PROTEIN CHEMISTRY

- ☐ (30) Amino acid analysis
- ☐ (31) Chromatography
- ☐ (32) Affinity
- ☐ (33) Gas
- ☐ (34) HPLC
- ☐ (35) Thin layer
- ☐ (36) Electrophoresis of proteins
- ☐ (37) Glycoprotein analysis
- ☐ (38) Peptide mapping
- ☐ (39) Peptide synthesis
- ☐ (40) Protein kinase assays
- ☐ (42) Protein purification
- ☐ (43) Protein sequencing

IMMUNOLOGY

- ☐ (50) Antibody labeling
- ☐ (51) Antibody purification
- ☐ (52) Ascites production
- ☐ (53) ELISA
- ☐ (54) Flow cytometry
- ☐ (55) Hybridoma production
- ☐ (56) Immunohistochemistry
- ☐ (57) Immunoprecipitation
- ☐ (58) RIA
- ☐ (59) Western blotting

CELL BIOLOGY

- ☐ (70) Apoptosis
- ☐ (71) Cell proliferation
- ☐ (72) ES cell culture
- ☐ (73) Growth factors/cytokines
- ☐ (74) Insect cell culture
- ☐ (75) Mammalian cell culture
- ☐ (76) Microscopy
- ☐ (77) Plant cell culture
- ☐ (78) Receptor studies
- ☐ (79) Serum-free cell culture

TEL: Continental U.S. and Canada: 1-800-843-4388 All other locations: 516-349-1930 FAX: 516-349-1946

All prices subject to change without notice.

Orders for Japan: Maruzen Company Ltd., 3 - 10, Nihonbashi 2-Chome, Chuo-ku, Tokyo 103, Japan. **Orders for India, Pakistan, Bangladesh, Sri Lanka, and Nepal:** Narosa Book Distributors Private Limited, 6 Community Centre, Panchsheel Park, New Delhi 110 017, India.

GENOME RESEARCH

For fastest service, call:

1-800-843-4388

Continental U.S.
and Canada

516-349-1930

All other locations

FAX: 516-349-1946

E-MAIL:

cshpress@cshl.org

world wide web site

http://www.cshl.org/



**Cold Spring Harbor
Laboratory Press**

Plainview, NY 11803-2500



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 150 HICKSVILLE, NY

POSTAGE WILL BE PAID BY ADDRESSEE

Cold Spring Harbor Laboratory Press
10 Skyline Drive
Plainview, NY 11803-2500



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

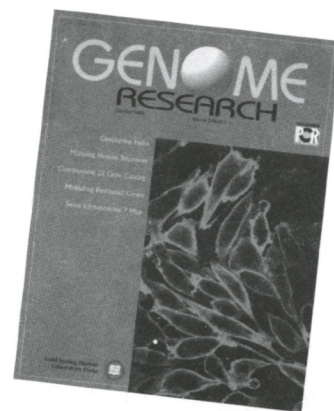


BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 150 HICKSVILLE, NY

POSTAGE WILL BE PAID BY ADDRESSEE

Cold Spring Harbor Laboratory Press
10 Skyline Drive
Plainview, NY 11803-2500



For fastest service, call:

1-800-843-4388

Continental U.S.
and Canada

516-349-1930

All other locations

FAX: 516-349-1946

E-MAIL:

cshpress@cschl.org

world wide web site

<http://www.cshl.org/>



**Cold Spring Harbor
Laboratory Press**

Plainview, NY 11803-2500



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT #5 COLD SPRING HARBOR, N.Y.

POSTAGE WILL BE PAID BY ADDRESSEE

Advertising Manager
Library Building
COLD SPRING HARBOR LABORATORY PRESS
PO Box 100
Cold Spring Harbor, NY 11724-2300



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT #5 COLD SPRING HARBOR, N.Y.

POSTAGE WILL BE PAID BY ADDRESSEE

Advertising Manager
Library Building
COLD SPRING HARBOR LABORATORY PRESS
PO Box 100
Cold Spring Harbor, NY 11724-2300



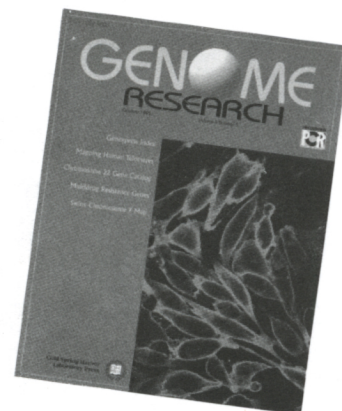
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT #5 COLD SPRING HARBOR, N.Y.

POSTAGE WILL BE PAID BY ADDRESSEE

Advertising Manager
Library Building
COLD SPRING HARBOR LABORATORY PRESS
PO Box 100
Cold Spring Harbor, NY 11724-2300



COLD SPRING HARBOR



LABORATORY PRESS