

# With Stratagene's New Seamless™ Cloning Kit\*



## make large-scale changes to genes in 1 day!

### PRECISE

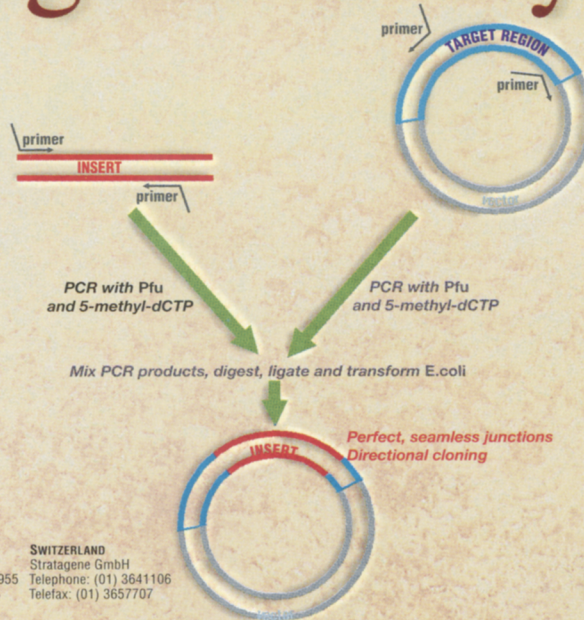
- Directional
- Low background
- >90% cloning efficiency
- No extraneous bases

### VERSATILE APPLICATIONS

- Expression cloning
- Domain substitution
- Insertions and deletions of DNA sequences
- Chimeric gene construction: receptors, antibodies, and other fusion proteins

### SIMPLE 1 DAY CLONING

1. Design your primers
2. PCR†
3. Digest/Ligate
4. Transform *E. coli*



- No restriction sites needed
- No fragment isolation
- No extraneous nucleotides
- Seamless directional cloning

*Another creative cloning solution from Stratagene!*

### SEAMLESS™ CLONING KIT CATALOG# 214400

Padgett, K.A., and Sorge, J.A. (1996) Gene 168:31-35

\*PATENT PENDING

† Purchase of these enzymes is accompanied by a license to use them in the Polymerase Chain Reaction (PCR) process in conjunction with an Authorized Thermal Cycler. Stratagene's PCR products are sold under licensing arrangements with Roche Molecular Systems, Inc., F. Hoffmann-La Roche Ltd. and The Perkin-Elmer Corporation.

INTERNET MAIL  
techservices@stratagene.com

USA  
Corporate Headquarters  
(800) 424-5444  
(619) 535-5400  
Fax: (619) 535-0045

GERMANY  
Stratagene GmbH  
Telephone: (06221) 400634  
Telefax: (06221) 400639

UNITED KINGDOM  
Stratagene Ltd.  
Telephone: (01223) 420955  
Telefax: (01223) 420234

SWITZERLAND  
Stratagene GmbH  
Telephone: (01) 3641106  
Telefax: (01) 3657707



# GENOME RESEARCH

Volume 6 Number 2  
February 1996

## Editors

**Mark Boguski**  
National Center for Biotechnology  
Information/NIH  
**Aravinda Chakravarti**  
Case Western Reserve University  
**Richard Gibbs**  
Baylor College of Medicine

**Eric Green**  
National Center for Human Genome  
Research, NIH  
**Richard Myers**  
Stanford University School of Medicine

## Managing Editor

**Judy Cuddihy**  
Cold Spring Harbor Laboratory

## News and Reviews Editor

**Alison Stewart**  
Cambridge, U.K.

## Editorial Board

**Rakesh Anand**  
Zeneca Pharmaceuticals  
**Stylianios Antonarakis**  
University of Geneva  
**Charles Auffray**  
CNRS  
**Philip Avner**  
Institut Pasteur  
**Andrea Ballabio**  
Telethon Institute of Genetics and  
Medicine  
**David Bentley**  
The Sanger Centre  
**Bruce Birren**  
Whitehead Institute/MIT Center for  
Genome Research  
**Michael Boehnke**  
University of Michigan School of  
Public Health  
**Anne Bowcock**  
University of Texas Southwestern  
Medical Center  
**David Burke**  
University of Michigan Medical School  
**Jeffrey Chamberlain**  
University of Michigan Medical School  
**Ellson Chen**  
Perkin-Elmer Corporation  
**David R. Cox**  
Stanford University School of Medicine  
**Ronald W. Davis**  
Stanford University School of Medicine  
**Richard Durbin**  
Sanger Centre, UK  
**Joseph Ecker**  
University of Pennsylvania  
**Beverly S. Emanuel**  
Children's Hospital of Philadelphia  
**Raymond Fenwick**  
Biodale Laboratories  
**Chris Fields**  
National Center for Genome Resources  
**Simon Foote**  
Walter and Eliza Hall Institute of  
Medical Research

**Phil Green**  
University of Washington  
**Kenshi Hayashi**  
Kyushu University  
**Philip Hieter**  
The Johns Hopkins University School  
of Medicine  
**Clare Huxley**  
St. Mary's Hospital Medical School  
**Howard J. Jacob**  
Massachusetts General Hospital-East  
**Alec Jeffreys**  
University of Leicester  
**Mark Johnston**  
Washington University School of  
Medicine  
**Mary-Claire King**  
University of California School of  
Public Health  
**Ben Koop**  
University of Victoria  
**Pui-Yan Kwok**  
Washington University School of  
Medicine  
**Ulf Landegren**  
Uppsala Biomedical Center  
**Mark Lathrop**  
The Wellcome Trust Centre  
**Michael Lovett**  
University of Texas Southwestern  
Medical Center  
**Jen-i Mao**  
Genome Therapeutics Corporation  
**Douglas Marchuk**  
Duke University Medical Center  
**Thomas Marr**  
Cold Spring Harbor Laboratory  
**W. Richard McCombie**  
Cold Spring Harbor Laboratory  
**Susan Naylor**  
University of Texas Health Science  
Center  
**David Nelson**  
Baylor College of Medicine

**Maynard Olson**  
University of Washington  
**Svante Pääbo**  
University of Munich  
**Leena Peltonen**  
National Public Health Institute, Helsinki  
**David Porteous**  
MRC Human Genetics Unit  
Western General Hospital, Edinburgh  
**Roger Reeves**  
Johns Hopkins University School of  
Medicine  
**Bruce Roe**  
University of Oklahoma  
**Rodney Rothstein**  
Columbia University College of P&S  
**Gerald Rubin**  
University of California, Berkeley  
**Lloyd Smith**  
University of Wisconsin-Madison  
**Randall Smith**  
Baylor College of Medicine  
**Marcelo Bento Soares**  
Columbia University and the New  
York State Psychiatric Institute  
**William Studier**  
Brookhaven National Laboratory  
**Grant Sutherland**  
Women's and Children's Hospital,  
Adelaide  
**Barbara Trask**  
University of Washington  
**Gert-Jan B. van Ommen**  
Leiden University  
**John J. Wasmuth**  
University of California, Irvine  
**Robert B. Weiss**  
University of Utah  
**Jean Weissenbach**  
Genethon, CNRS  
**Richard Wilson**  
Washington University School of  
Medicine  
**James Womack**  
Texas A&M University

## Editorial Office

Cold Spring Harbor Laboratory Press  
1 Bungtown Road  
Cold Spring Harbor, New York 11724  
Phone (516) 367-8492  
Fax (516) 367-8334  
<http://www.cshl.org>

## Editorial/Production

**N. Dumser**, Technical Editor  
**K. Kraus**, Production  
**C. Schneider**, Production  
**D. Lawrence**, Editorial Secretary



*Advertise in  
Genome Research  
and reach 25,000 of the most important people  
in the Genome Community!*

**Call or FAX Teresa Tiganis, Advertising Manager for rates and availability.  
Tel. (516) 367-8351, FAX (516) 367-8532.**

Reader Service No. 158

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 1054-9803) is published monthly for \$495 (U.S. institutional; \$545 R.O.W.), \$95 (individual making personal payment; \$145 R.O.W., includes airlift) by Cold Spring Harbor Laboratory Press, 1 Bungtown Road, Cold Spring Harbor, New York 11724. Second class 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. \$95; R.O.W. \$145 (includes airlift). Institutional: U.S. \$495; R.O.W. \$545 (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: Teresa Tiganis, 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 (1054-9803/96 + \$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 © 1996 by Cold Spring Harbor Laboratory Press

**Obituary**

John J. Wasmuth, 1946–1995 **69**

**REVIEW**

---

Around the Genomes: The *Drosophila* Genome Project Gerald M. Rubin **71**

**RESEARCH PAPERS**

- 
- |   |   |            |
|---|---|------------|
| A Graph Theoretic Approach to the Analysis of DNA Sequencing Data   | Anthony J. Berno  | <b>80</b>  |
| Sorsby's Fundus Dystrophy in the British Isles: Demonstration of a Striking Founder Effect by Microsatellite-generated Haplotypes | Sujeewa D. Wijesuriya, Kevin Evans, Marcelle R. Jay, Charles Davison, Bernhard H.F. Weber, Alan C. Bird, Shomi S. Bhattacharya, and Cheryl Y. Gregory   | <b>92</b>  |
| The <i>Xmrk</i> Oncogene Promoter is Derived from a Novel Amplified Locus of Unusual Organization                                 | Dorothee Förmzler, Joachim Altschmied, Indrajit Nanda, Renate Kolb, Monika Baudler, Michael Schmid, and Manfred Scharl  | <b>102</b> |
| Methylation Analysis of a Marsupial X-linked CpG Island by Bisulfite Genomic Sequencing   | David A.F. Loebel and Peter G. Johnston   | <b>114</b> |
| Cloning and Characterization of a Novel Human Gene Related to Vascular Endothelial Growth Factor                                  | Sean Grimmond, Jacob Lagercrantz, Cathy Drinkwater, Ginters Silins, Steven Townson, Pamela Pollock, David Gotley, Emma Carson, Steven Rakar, Magnus Nordenskjöld, Larry Ward, Nicholas Hayward, and Günther Weber | <b>124</b> |

Discovering Distinct Genes Represented in 29,570 Clones from Infant Brain cDNA Libraries by Applying Sequencing by Hybridization Methodology	Aleksandar Milosavljevic, Marija Zeremski, Zaklina Strezoska, Danica Grujic, Hristem Dyanov, Shawna Batus, David Salbego, Tatjana Paunesku, M. Bento Soares, and Radomir Crkvenjakov	132
Distribution and Evolution of CTG Repeats at the Myotonin Protein Kinase Gene in Human Populations	Ranjan Deka, Partha P. Majumder, Mark D. Shriver, David N. Stivers, Yixi Zhong, Ling M. Yu, Ramiro Barrantes, Shih-Jiun Yin, Tetsuro Miki, Joachim Hundrieser, Clareann H. Bunker, Stephen T. McGarvey, Sameer Sakallah, Robert E. Ferrell, and Ranajit Chakraborty	142

---

## GENOME METHODS

---

Cross-screening: A New Method to Assemble Clones Rapidly and Unambiguously into Contigs	John Locke, Greg Rairdan, Heather McDermid, David Nash, David Pilgrim, John Bell, Kenneth Roy, and Ross Hodgetts	155
Errata		166
Product News		167

**COVER** *Drosophila melanogaster* metaphase chromosomes (*top*), an embryo that has been subjected to in situ hybridization with a probe made from a gene homologous to the *B. subtilis ipa-6d* gene (*middle*; intense labeling of a small group of cells is seen), and a diagram of approximately 20 kb of annotated genomic sequence (*bottom*). (For details, see Rubin, p. 71.)