

Turn sequencing on its head.

It's here. Now you can perform a range of genomic experiments that you only dreamed of before. The Illumina Genome Analyzer changes the way you approach every kind of genomic experiment. The discoveries are happening, the wait is over, and our customers are publishing their results.

Change the way you think about sequencing.
Join the growing Illumina Community.

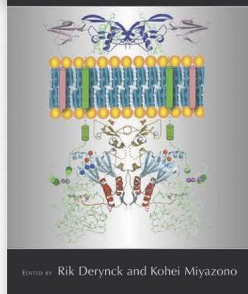
Do more with sequencing today:

www.morethansequencing.com



The TGF- β Family

The TGF- β Family



Cold Spring Harbor Monograph Series 50

Edited by Rik Derynck, *University of California, San Francisco*, and Kohei Miyazono, *University of Tokyo*

TGF- β is the prototype of a protein superfamily which, in humans, contains at least 35 members, including activins, inhibins, bone morphogenetic proteins, growth/differentiation factors, and Müllerian inhibiting substance. This monograph draws on the world's leading laboratories to comprehensively cover all aspects of the biology of TGF- β and serve as a reference work for both specialists and researchers less familiar with the field.

2008, 1,114, illus., index

Hardcover \$135

ISBN 978-087969752-5

CONTENTS

Preface

Foreword

M. Sporn

1. The Discovery of TGF- β : A Historical Perspective
H.L. Moses and A.B. Roberts
2. TGF- β and the TGF- β Family
R. Derynck and M. Miyazono

CELL BIOLOGY

3. TGF- β : The Multipotential Cytokine
S.H. Schilling, A.B. Hjelmeland, J.N. Rich, and X.-F. Wang
4. Activins and Inhibins
E. Wüster and W. Vale
5. The Bone Morphogenetic Proteins
T. Katagiri, T. Suda, and K. Miyazono

SIGNALING

6. Signaling Receptors of the TGF- β Family
J.L. Wrana, B. Ozdamar, C. Le Roy, and H. Benchabane
7. TGF- β Bioavailability: Latency, Targeting, and Activation
B. Dabovic and D.B. Rifkin
8. Agonists and Antagonists of the TGF- β Family Ligands
C. Chang
9. TGF- β Signaling from Receptors to Smads
C.-H. Heldin
10. Transcriptional Control via Smads
X. Lin, Y.-G. Chen, and X.-H. Feng
11. Growth Control by TGF- β : Mechanisms Controlling Cell Cycle Progression and Apoptosis
P.M. Siegel and J. Massagué
12. Regulation of TGF- β Family Signaling by Inhibitory Smads
K. Miyazono

13. Structural Basis for TGF- β Family Receptor Assembly and Signaling Specificity
K. Lin and S. Choe
14. Non-Smad TGF- β Signaling Pathways
Y.E. Zhang
15. Regulation of the Smad Pathway by Signaling Cross-Talk
K. Luo

DIFFERENTIATION, DEVELOPMENT, AND PHYSIOLOGY

16. TGF- β Family Signaling in Early Postimplantation Development of the Mouse
S. Miura, M. Whitman, and Y. Mishina
17. TGF- β Family Signaling in *Drosophila*
G. Pyrowolakis, B. Hartmann, and M. Affolter
18. TGF- β Signaling in the Nematode *C. elegans*
G.I. Patterson and R.W. Padgett
19. TGF- β Family Signaling in *Xenopus* and Zebrafish Embryos
M. Whitman
20. TGF- β Family Signaling in Stem Cell Renewal and Differentiation
T. Watabe and K. Miyazono
21. TGF- β Family in Mesenchymal Differentiation
R. Derynck, E. Piek, R.A. Schneider, L. Choy, and T. Alliston
22. TGF- β Family in Skeletal Development, Maintenance, and Disease
T. Alliston, E. Piek, and R. Derynck
23. The TGF- β Family in Epithelial Development
N.M. Muñoz and W.M. Grady

24. TGF- β Family in Endothelial Cell Differentiation and Cardiovascular Development and Function
M.-J. Goumans, R. Carvalho, C. Mummery, and P. ten Dijke
25. TGF- β as a Regulator of Myeloid and Lymphoid Development and Function
J.J. Letterio and F.W. Ruscetti
26. TGF- β Family in Neural and Neuronal Differentiation and Development
J. Samanta, M.A. Bonaguidi, and J.A. Kessler
27. The TGF- β Family in the Reproductive Tract
S.A. Pangas and M.M. Matzuk

CANCER AND DISEASE

28. TGF- β Signaling Pathway and Tumor Suppression
W.M. Grady and S.D. Markowitz
29. TGF- β Signaling in Epithelial-Mesenchymal Transition and Invasion and Metastasis
R.J. Akhurst
30. TGF- β and the Tumor Microenvironment
B. Bierie and H.L. Moses
31. TGF- β and Fibrosis
E.P. Böttinger
32. Development of TGF- β -based Therapeutic Agents: Capitalizing on TGF- β 's Mechanisms of Action and Signal Transduction Pathways
C.L. Arteaga and J.M. McPherson
33. BMP-based Therapeutics and the BMP Signaling Pathways
G. Bain, A.J. Celeste, and J.M. Wozney

Index

www.cshlpress.com

To order or request additional information:

Call: 1-800-843-4388 (Continental US and Canada) 516-422-4100 (All other locations)

FAX: 516-422-4097 E-mail: cshpress@cschl.edu

www.cshlpress.com



obvious.



Get the cDNA price the other guys can't clone!
Lowest Price • Highest Quality • Largest Selection • Fastest Delivery

The Mammalian Gene Collection, the world's largest collection of sequence-verified, full-length cDNAs, is available at the industry-leading price of \$75 per clone. We offer additional collections of cDNAs, ORFs, promoters, and strains from more than 17 species!

- Most online search results are returned in ~1 second
- Delivery in 48 hours

Call toll free or visit www.openbiosystems.com today and discover why we're the fastest growing clone provider in the industry.

The Gene Analysis Company



Toll Free 888.412.2225
www.openbiosystems.com



genomic research educational outreach economic development

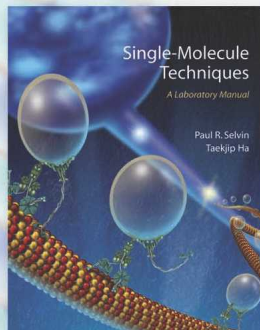
The HudsonAlpha Institute for Biotechnology salutes Open Biosystems, one of 13 companies located on the 120-acre CRP Biotech Campus. For information about the campus and site availability, bizdev@hudsonalpha.org.

Huntsville, Alabama • hudsonalpha.org

Single-Molecule Techniques

A Laboratory Manual

Edited by Paul R. Selvin and Taekjip Ha, *University of Illinois, Urbana-Champaign*



As molecular and cellular biologists move toward nano-techniques for performing experiments on single molecules rather than on populations of molecules, a comprehensive manual on how (and why) to carry out such experiments is needed. *Single-Molecule Techniques: A Laboratory Manual* fills this requirement—it is the first to take researchers who know nothing about single-molecule analyses to the point where they can successfully design and execute appropriate experiments. Geared toward research scientists in structural and molecular biology, biochemistry, and biophysics, the manual will be useful to all who are interested in observing, manipulating, and elucidating the molecular mechanisms and discrete properties of macromolecules. Techniques range from in vivo and in vitro fluorescent-based methods to the use of atomic force microscopy, optical and magnetic tweezers, and nanopores. The book is edited by

Paul R. Selvin and Taekjip Ha, two pioneers in the field of experimental biophysics who have made significant contributions to the development and application of single-molecule technologies.

2008, 507 pp., illus., appendix, index

Hardcover \$240

Paperback \$165

ISBN 978-087969776-1

ISBN 978-087969775-4

CONTENTS

Preface

1. The New Era of Biology In Singulo, *T. Ha and P.R. Selvin*

IN VITRO FLUORESCENCE

2. Single-Molecule FRET with Total Internal Reflection Microscopy, *C. Joo and T. Ha*
3. In Vitro and In Vivo FIONA and Other Acronyms for Watching Molecular Motors Walk, *P.R. Selvin, T. Loughheed, M.T. Hoffman, H. Park, H. Balci, B.H. Blehm, and E. Toprak*
4. Colocalization of Fluorescent Probes: Accurate and Precise Registration with Nanometer Resolution, *L.S. Churchman and J.A. Spudich*
5. Alternating-Laser Excitation of Single Molecules, *A.N. Kapanidis, M. Heilemann, E. Margeat, X. Kong, E. Nir, and S. Weiss*
6. Orientation and Rotational Motions of Single Molecules by Polarized Total Internal Reflection Fluorescence Microscopy, *J.F. Beausang, Y. Sun, M.E. Quinlan, J.N. Forkey, and Y.E. Goldman*

FLUORESCENCE IN LIVING CELLS

7. Imaging Gene Expression in Living Cells at the Single-Molecule Level, *J. Xiao, J. Elf, G.-W. Li, J. Yu, and X.S. Xie*
8. Single-Virus Tracking in Live Cells, *M.J. Rust, M. Lakadamyali, B. Brandenburg, and X. Zhuang*
9. Ultrasensitive Imaging in Live Cells Using Fluorescent Quantum Dots, *S. Courty and M. Dahan*
10. Imaging Real-Time Gene Expression in Living Systems, *A.L. Wells, J.S. Condeelis, R.H. Singer, and D. Zenklusen*
11. Single-Molecule Imaging of Stochastic Signaling Events in Living Cells, *S. Matsuoka, Y. Miyazawa, T. Yanagida, and M. Ueda*
12. Fluorescence Correlation Spectroscopy In Vitro and In Vivo, *E. Haustein and P. Schwill*

OPTICAL TRAPS

13. Optical Traps to Study Properties of Molecular Motors, *J.A. Spudich, S.E. Rice, R.S. Rock, T.J. Purcell, and H.M. Warrick*
14. High-Resolution Dual-Trap Optical Tweezers with Differential Detection, *C. Bustamante, Y.R. Chemla, and J.R. Moffitt*
15. Imaging and Nanomanipulation of an Actomyosin Motor, *S. Nishikawa, T. Komori, T. Ariga, T. Okada, M. Morimatsu, Y. Ishii, and T. Yanagida*

MAGNETIC TRAPS

16. Single-Molecule Studies Using Magnetic Traps, *T. Lionnet, J.-F. Allemand, A. Revyakin, T.R. Strick, O.A. Saleh, D. Bensimon, and V. Croquette*

FORCE PROBES/ATOMIC FORCE MICROSCOPY

17. Probing Polysaccharide and Protein Mechanics by Atomic Force Microscopy, *M. Rabbi and P.E. Marszalek*

CHANNELS

18. Single-Molecule Analysis of Nucleic Acids and DNA-Protein Interactions Using Nanopores, *M. Wanunu and A. Meller*

OTHER TECHNIQUES

19. Single-Molecule Gold-Nanoparticle Tracking with High Temporal and Spatial Resolution and without an Applied Load, *A.R. Dunn and J.A. Spudich*
20. Advances in Surface-based Assays for Single Molecules, *P.M. Fordyce, M.T. Valentine, and S.M. Block*
21. Hydrodynamic Flow-stretching Assay for Single-Molecule Studies of Nucleic Acid-Protein Interactions, *C.M. Schroeder, P.C. Blainey, S. Kim, and X.S. Xie*

APPENDIX: Cautions

Index

www.cshlpress.com

To order or request additional information, please visit our Web site or:

Call: 1-800-843-4388 (Continental US and Canada) 516-422-4100 (All other locations)

FAX: 516-422-4097

E-mail: cshpress@cschl.edu

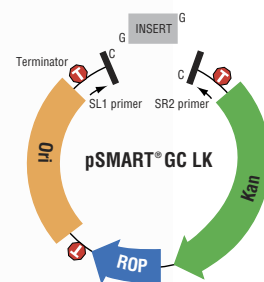
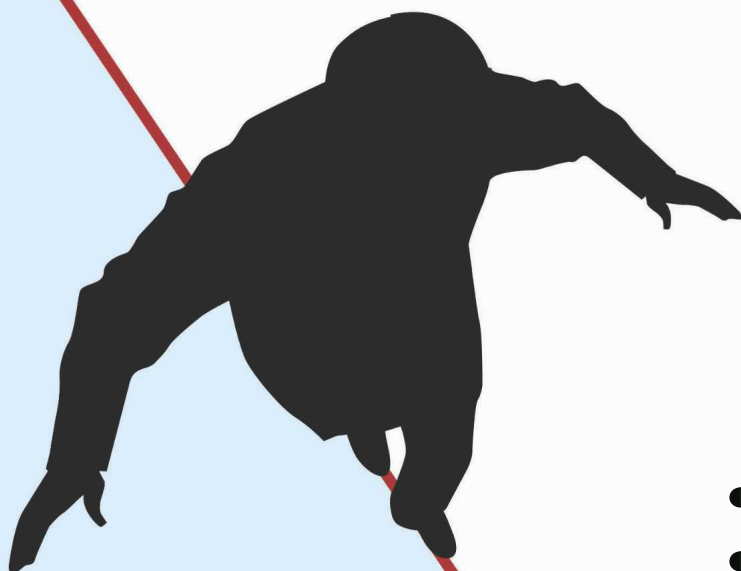
Write: Cold Spring Harbor Laboratory Press, 500 Sunnyside Blvd., Woodbury, NY 11797-2924



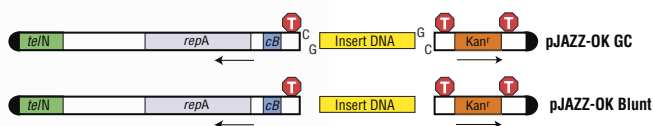
Clone with Confidence...

...with **NEW** Lucigen Vectors

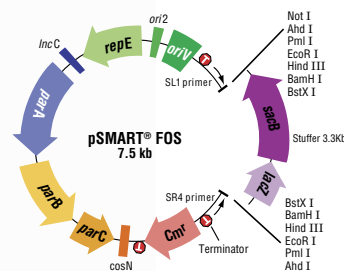
- GC Cloning, the superior TOPO TA alternative.
- ChimeraFree™ technology cuts sequencing time.
- BigEasy® v2.0 linear vectors for reliable long PCR cloning.
- CloneSmart® ultra-high stability vectors.
- CopyRight® v2.0 vectors for easy BAC and fosmid cloning.
- All kits contain vectors and competent cells.



Clone up to 15 kb



Clone up to 30 kb



Clone up to 40 kb

Lucigen®

Advanced Products for Molecular Biology

www.lucigen.com

Lucigen Corporation
2120 West Greenview Drive
Middleton, WI 53562
888 575 9695

TOPO and TA Cloning are registered trademarks of Invitrogen Corp.



some things are worth the wait.



Competent Cells from New England Biolabs

COMPLETING YOUR CLONING NEEDS

Make the switch to competent cells from New England Biolabs to help bring success to your research. Our expanded line of competent cells includes a variety of strains for cloning and expression, as well as strains with unique properties (see chart). For added convenience we offer a choice of efficiencies, formats and customized packaging. Now you can digest, ligate and transform with reagents from the name you trust.

Advantages:

- Extremely high transformation efficiencies
- Phage T1 resistance (*fhuA2*) preserves clone integrity
- Choice of protocols: high efficiency or 5 minute transformation
- Nonspecific endonuclease activity eliminated, resulting in highest quality plasmid preparations
- Express difficult or toxic proteins with T7 Express strains containing *lacI^q* and/or a novel *lysY* variant
- Obtain colonies faster than any other commercial strain with NEB Turbo
- SOC Outgrowth Media and pUC19 Control Plasmid included
- Free of animal products

Cloning strain characteristics	Strain	NEB #
Obtain colonies faster than any other commercial strain (6.5 hours)	NEB Turbo Competent <i>E. coli</i> *	C2984H/I
Versatile cloning strain	NEB 5-alpha Competent <i>E. coli</i> †*	C2987H/I
Cloning of toxic genes	NEB 5-alpha F' <i>I^q</i> Competent <i>E. coli</i>	C2992H/I
Cloning of large plasmids and BACs	NEB 10-beta Competent <i>E. coli</i> *	C3019H/I
Growth of unmethylated plasmids	<i>dam⁻/dcm⁻</i> Competent <i>E. coli</i>	C2925H/I
Expression strain characteristics	Strain	NEB #
Most popular non-T7 protein expression strain	NEB Express Competent <i>E. coli</i>	C2523H/I
Added control of IPTG induced expression with non-T7 plasmids	NEB Express <i>I^q</i> Competent <i>E. coli</i>	C3037H/I
Most popular T7 protein expression strain	T7 Express Competent <i>E. coli</i>	C2566H/I
Reduced basal expression	T7 Express <i>I^q</i> Competent <i>E. coli</i>	C3016H/I
Tight control of protein expression by inhibition of T7 RNA Polymerase	T7 Express <i>lysY</i> Competent <i>E. coli</i>	C3010H/I
Highest level of protein expression control	T7 Express <i>lysY/I^q</i> Competent <i>E. coli</i>	C3013H/I
For crystallography experiments/SeMet labeling	T7 Express Crystal Competent <i>E. coli</i>	C3022H/I

† Available as subcloning efficiency

* Available as electrocompetent cells

For more information and our international distribution network, please visit www.neb.com
For a copy of our new Competent Cell Brochure, please visit www.neb.com/literaturerequest

New England Biolabs Inc. 240 County Road, Ipswich, MA 01938 USA 1-800-NEB-LABS Tel. (978) 927-5054 Fax (978) 921-1350 info@neb.com
Canada Tel. (800) 387-1095 info@ca.neb.com • **China** Tel. 010-82378266 beijing@neb-china.com • **Germany** Tel. 0800/246 5227 info@de.neb.com
Japan Tel. +81 (0)3 5669 6191 info@neb-japan.com • **UK** Tel. (0800) 318486 info@uk.neb.com

 NEW ENGLAND
BioLabs®
the leader in enzyme technology

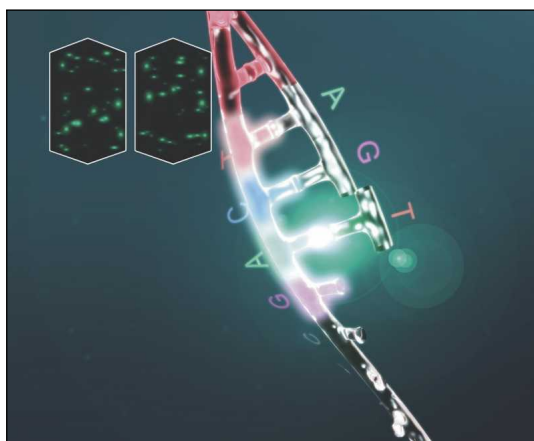


www.roche-applied-science.com



Genome Sequencer FLX System

Longer sequencing reads mean more applications.



Sequencing-by-Synthesis: Using an enzymatically coupled reaction, light is generated when individual nucleotides are incorporated. Hundreds of thousands of individual DNA fragments are sequenced in parallel.

In 2005, the Genome Sequencer 20 System was launched

- Read length: 100 bases
- 20 million bases in less than 5 hours

In 2007, the Genome Sequencer FLX System was launched

- Read length: 250 to 300 bases
- 100 million bases in less than 8 hours

Available in 2008, the Genome Sequencer FLX with improved chemistries

- Read length: >400 bases
- 1 billion bases in less than 24 hours

More applications lead to more publications.

Proven performance with an expanding list of applications and more than 130 peer-reviewed publications.

Visit www.genome-sequencing.com to learn more.

454 LIFE
SCIENCES

For life science research only. Not for use in diagnostic procedures.

454 and GENOME SEQUENCER are trademarks of 454 Life Sciences Corporation, Branford, CT, USA.

© 2008 Roche Diagnostics. All rights reserved.

Roche Diagnostics
Roche Applied Science
Indianapolis, Indiana



CAREER TRACKS

Dedicated entirely to Employment, Conferences, Meetings, Fellowships, and Grants



Greenebaum Cancer Center and the Department of Biochemistry and Molecular Biology Research Associate Position

A Research Associate position is available to study the sensitivity of cancer cells to histone deacetylase inhibitors (HDACIs). In addition of proficiency in molecular, cellular and protein biochemistry techniques, expertise in the cancer field with HDACIs and primary cells is also desired. Salary commensurate with experience. Send resume and three letters of recommendation to:

Dr. France Carrier
University of Maryland, Baltimore
655 W Baltimore St., Room 1037
Baltimore, MD 21201-1595
fcarr001@umaryland.edu

The University of Maryland, Baltimore is an Equal Opportunity, Affirmative Action employer.



The University of Hong Kong

Postdoctoral Positions in Genomics, Proteomics, and Bioinformatics (Ref: RF-2007/2008-507)

The University of Hong Kong Genome Research Centre invites highly qualified and motivated individuals to join a focused multi-disciplinary team to develop methodologies and applications to dissect relevant model systems of disease. Available positions:

(i) **Molecular Biologist/ Cell Biologist** to make use of the next generation ultra-high throughput DNA sequencers for genome, epigenome, metabolome and the transcriptome characterization to elucidate their role in disease. Productive experience in nucleic acid manipulation and isolation is essential. Areas of investigation include: cancer, metabolic disease, and host-pathogen interaction particularly of influenza and other respiratory viruses.

(ii) **Analytical Protein Chemist** interested to develop new sensitive analytical tools to characterize the proteome in disease models. Experience in mass-spectrometry and protein purification is essential. Candidate will have the opportunity to participate in the expansion of the current proteomics program and to explore new areas of investigation.

(iii) **Computational Biologist/ Bioinformaticist** to develop new analytical tools and applications for genetic data generated from the new generation Solexa and SOLiD DNA sequencers and other high-throughput genomics platforms. Experience in algorithm design and/or mathematics is desirable. Candidate will have the opportunity to explore new computational approaches and the use of modern instrumentations to address important biological and computational problems.

Hands on experience with a record of productivity, teamwork and innovation are essential. Positions are for two years duration with the possibility of renewal. The Genome Research Centre is a large well-funded state-of-the-art research and core service facility. We focus on basic and translational research for the benefit of society. Hong Kong offers a vibrant and stimulating working environment in close proximity to major Asian research centres to foster research collaboration and exchange.

Applicants should submit a cover letter describing research interest, a full CV, and references to: Professor Si Lok, Genome Research Centre, The Li Ka Shing Faculty of Medicine, The University of Hong Kong, 21 Sassoon Rd, Pokfulam, Hong Kong, China, email: silok@hkucc.hku.hk

A POSTDOCTORAL POSITION/ GROUP LEADER POSITION IN PRAGUE

Available at the Department of Mouse Molecular Genetics, Institute of Molecular Genetics AS CR, Prague, Czech Republic, to study the gene regulatory networks in somatic and male germ cells (see Homolka et al. Genome Research, 2007, 17:1431) as a part of a larger project of systems genetics. The recently established mouse intersubspecies chromosome substitution strains (see Gregorova et al. in this issue of Genome Research) will be used as the main model system. Available are the latest Affymetrix GeneChip instruments including GeneChip 640 Hybridization Oven, GeneChip 450 Fluidics Station and GeneChip 3000 7G Scanner. The facility is also provided with Agilent 2100 Bioanalyzer, NanoDrop ND-1000 Spectrophotometer and MJ Research PTC 100 Thermal Cyclers. Illumina's BeadStation gene expression system and Roche LightCycler-480 system with automated sample preparation are also on the premises.

The applicant must have a Ph.D. degree and experience in mouse functional genomics, gene expression profiling, and genomics-oriented computational biology.

Please, send your CV, list of publications, and names of three references by April 15, 2008 to:

Jiri Forejt, Chair
Department of Mouse Molecular Genetics
Institute of Molecular Genetics
Academy of Sciences of the Czech Republic
Videnska 1083, 142 20 Prague 4
Czech Republic
Email jforejt@img.cas.cz

23rd ANNUAL New England Biolabs

Molecular Biology Summer Workshops



when:

Two-week Sessions:

Session 1: June 1 – 14, 2008

Session 2: June 15 – 28, 2008

One-week Sessions:

Session 3: July 6 – 12, 2008

Session 4: July 13 – 19, 2008

where:

Clark Science Center
Smith College
Northampton, MA USA

apply online:

For additional information, visit the
Summer Workshop web site at
<http://www.science.smith.edu/neb>
email us at biolabs@email.smith.edu
or call (413) 247-3004 and leave a message.

Dr. Steven A. Williams
Clark Science Center, Smith College
Northampton, MA 01063

apply
online!

We are pleased to announce the twenty-third annual Molecular Biology Summer Workshops, sponsored by New England Biolabs in conjunction with Smith College. Workshops are held at the Clark Science Center, Smith College, Northampton, MA, USA. Well over 3,000 people have graduated from this intensive training program in the past twenty-two years.

Learn Molecular Biology in 1 or 2 Weeks!

These intensive courses emphasize hands-on molecular biology laboratory work and cover a wide variety of topics and techniques.

Topics/Techniques:

- :: gene cloning (cDNA and genomic)
- :: gene expression analysis
- :: PCR and quantitative RT-PCR
- :: genomics and bioinformatics
- :: DNA sequencing and DNA fingerprinting
- :: RNAi, siRNA and microarrays
- :: and much more – visit our web site for a complete list

Announcing our new ONE week Molecular Biology Sessions!

Session 3 is designed specifically for beginners. No prior molecular biology experience is required. Techniques and topics covered will include DNA cloning, PCR, DNA sequencing, genomics and bioinformatics.

Session 4 is designed for the more advanced student. This session will include techniques used in gene expression analysis including cDNA cloning, microarray analysis, RNAi and quantitative RT-PCR.

All of the above topics are covered in the two-week sessions.

Application Information:

No previous experience in molecular biology is required or expected. Fifty participants per session will be selected from a variety of disciplines and academic backgrounds, including principal investigators, directors of programs, medical doctors, postdoctoral fellows, graduate students, research assistants, sales associates, equipment engineers, etc.

FEE: \$3995 per participant (2 week sessions) and \$1995 per participant (1 week sessions). This fee includes lab manual, use of all equipment and supplies, and room and board (all rooms are singles).

APPLICATION DEADLINE: May 1, 2008. First come, first served (apply now!).
Late applications will be accepted on a space available basis.

PAYMENT DEADLINE: Three weeks following receipt of your email acceptance letter.

 NEW ENGLAND
BioLabs[®] Inc.
the leader in enzyme technology