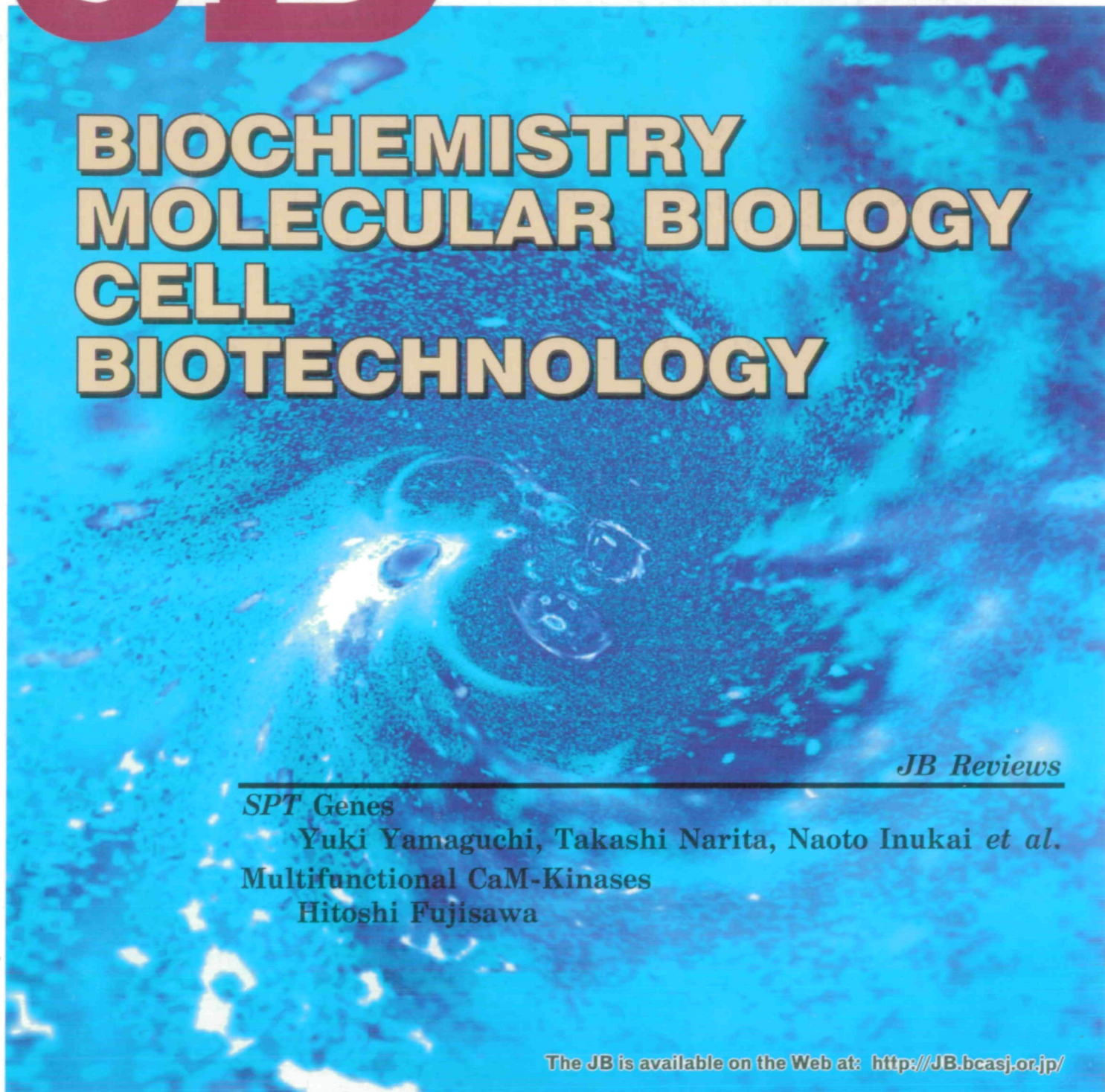


JB

VOLUME 129 NO.2 FEB 2001

THE JOURNAL OF BIOCHEMISTRY



**BIOCHEMISTRY
MOLECULAR BIOLOGY
CELL
BIOTECHNOLOGY**

JB Reviews

SPT Genes

Yuki Yamaguchi, Takashi Narita, Naoto Inukai *et al.*

Multifunctional CaM-Kinases

Hitoshi Fujisawa

The JB is available on the Web at: <http://JB.bcasj.or.jp/>

EDITORIAL BOARD

Editor-in-Chief
Koichi SUZUKI (Tokyo)

Editors

<i>JB Reviews</i>	Tadaomi TAKENAWA (Tokyo)
<i>Biochemistry</i>	Toshisuke KAWASAKI (Kyoto)
	Eiki KOMINAMI (Tokyo)
<i>Molecular Biology</i>	Yoshiaki FUJII-KURIYAMA (Sendai)
<i>Cell</i>	Toshiaki KATADA (Tokyo)
<i>Biotechnology</i>	Izumi KUMAGAI (Sendai)

Managing Editors

Toshiaki KATADA (Tokyo) Naoyuki TANIGUCHI (Suita)

Associate Editors

<i>Biochemistry</i>	Kuniyo INOUE (Kyoto)	Katsura IZUI (Kyoto)
	Hideo KANO (Sapporo)	Hisao KATO (Suita)
	Shinichi KOHSAKA (Kodaira)	Masataka MORI (Kumamoto)
	Masaru TANOKURA (Tokyo)	Tomofusa TSUCHIYA (Okayama)
	Shuichi TSUJI (Hadano)	Akihito YAMAGUCHI (Ibaraki)
<i>Molecular Biology</i>	Kenji YAMAMOTO (Fukuoka)	
	Fumio HANAOKA (Suita)	Kenshi HAYASHI (Fukuoka)
	Motoya KATSUKI (Tokyo)	Kunihiro MATSUMOTO (Nagoya)
	Hiroyuki SASAKI (Mishima)	Masayuki YAMAMOTO (Tsukuba)
	Tatsuya HAGA (Tokyo)	Atsushi MIYAJIMA (Tokyo)
<i>Cell</i>	Akihiko NAKANO (Wako)	Shigeo OHNO (Yokohama)
	Kenji SOBUE (Suita)	
	Shinji IJIMA (Nagoya)	Masahiro IWAKURA (Tsukuba)
<i>Biotechnology</i>	Yasufumi KANEDA (Suita)	Eiichi TAMIYA (Ishikawa)

Advisory Board

Biochemistry

Elinor T. ADMAN (Seattle)
Shoei FURUKAWA (Gifu)
Masaaki HIROSE (Uji)
Tokuji IKEDA (Kyoto)
Makoto ITO (Fukuoka)
Ushio KIKKAWA (Kobe)
Hisatake KONDO (Sendai)
Ta-Hsiu LIAO (Taipei)
Alfred H. MERRILL, Jr. (Atlanta)
Norio MUTO (Shobara)
Fumihiko SATO (Kyoto)
Yukio SUGIURA (Uji)
Dennis E. VANCE (Edmonton)
Satoshi YAMASHITA (Maebashi)
Tadashi YOSHIMOTO (Nagasaki)

Kurt DRICKAMER (Oxford)
Saburo HARA (Kyoto)
Michio HOMMA (Nagoya)
Tatsuro IRIMURA (Tokyo)
Keiichi KAWANO (Toyama)
Kiyoshi KITA (Tokyo)
Konosuke KUMAKURA (Tokyo)
Masatomo MAEDA (Suita)
Taeko MIYAGI (Natori)
Hideaki NAGASE (London)
Toru SHIMIZU (Sendai)
Koji SUZUKI (Tsu)
Tetsuro YAMAMOTO (Kumamoto)
Koji YODA (Tokyo)

Kiyoshi FURUKAWA (Tokyo)
Seisuke HATTORI (Kodaira)
Yoshimi HOMMA (Fukushima)
Akio ITO (Fukuoka)
Seiichi KAWASHIMA (Tokyo)
Takehiko KOIDE (Hyogo)
Kunihiro KUWAJIMA (Tokyo)
Peter MALONEY (Baltimore)
Tomonari MURAMATSU (Tokyo)
Takaaki NISHIOKA (Kyoto)
Kazuyuki SUGAHARA (Kobe)
Noriaki TAKEGUCHI (Toyama)
Hirohei YAMAMURA (Kobe)
Shinji YOKOYAMA (Nagoya)

Molecular Biology

Hiroyuki ARAKI (Mishima)
Akira HORII (Sendai)
Hidetoshi INOKO (Isehara)
Daisuke KITAMURA (Noda)
Ken-ichirou MOROHASHI (Okazaki)
Lorenz POELLINGER (Stockholm)
Takashi TODA (London)
Hideyo YASUDA (Hachioji)

James D. ENGEL (Evanston)
Nobumichi HOZUMI (Noda)
Tetsuro ISHII (Tsukuba)
Hisao MASAI (Tokyo)
Tsunehiro MUKAI (Saga)
Tomokazu SUZUKI (Itami)
Morimasa WADA (Fukuoka)
Yoshihiro YONEDA (Suita)

Akiyoshi FUKAMIZU (Tsukuba)
Toshinori IDE (Hiroshima)
Takeo KISHIMOTO (Yokohama)
Takeshi MIZUNO (Nagoya)
Yusaku NAKABEPPU (Fukuoka)
Shoji TAJIMA (Suita)
Masao YAMADA (Tokyo)

Cell

Toshiya ENDO (Nagoya)	Yukio FUJIKI (Fukuoka)	Yasuhisa FUKUI (Tokyo)
Haruhiro HIGASHIDA (Kanazawa)	Masaki INAGAKI (Nagoya)	Makoto INUI (Ube)
Kozo KAIBUCHI (Nagoya)	Akira KIKUCHI (Hiroshima)	Toshio KITAMURA (Tokyo)
Eisuke MEKADA (Suita)	Takashi MURAMATSU (Nagoya)	Shigekazu NAGATA (Suita)
Toru NAKANO (Suita)	Kazuhisa NAKAYAMA (Tsukuba)	Masuo OBINATA (Sendai)
Hiroshi OHNO (Kanazawa)	Harumasa OKAMOTO (Tsukuba)	David SAFFEN (Tokyo)
Mamoru SANO (Kyoto)	Hiroyuki SUGIYAMA (Fukuoka)	Tetsuya TAGA (Tokyo)
Mitsuo TAGAYA (Hachioji)	Takashi YOKOTA (Tokyo)	Akihiko YOSHIMURA (Kurume)

Biotechnology

Yoshiharu DOI (Wako)	Nobuyoshi ESAKI (Uji)	Shigehisa HIROSE (Yokohama)
Patricia A. JENNINGS (San Diego)	Makoto KIMURA (Fukuoka)	Kazukiyo KOBAYASHI (Nagoya)
Izumi KUBO (Hachioji)	Isamu MATSUMOTO (Tokyo)	Kohnosuke MITANI (Los Angeles)
Fumio MIZUTANI (Tsukuba)	Teruyuki NAGAMUNE (Tokyo)	Satoshi NISHIKAWA (Tsukuba)
Shigemi NORIOKA (Suita)	Takahiro OCHIYA (Tokyo)	Teruo OKANO (Tokyo)
Kiyotaka SHIBA (Tokyo)	Masayasu SUZUKI (Iizuka)	Yoshinobu TAKAKURA (Kyoto)
Toshifumi TAKEUCHI (Hiroshima)	Norihiro TSUKAGOSHI (Nagoya)	

This JOURNAL, devoted to publication of original papers in the fields of biochemistry, molecular biology, cell, and biotechnology, was founded in 1922.

The JOURNAL is published monthly, with two volumes per annum.

All correspondences concerning this JOURNAL should be addressed to: The Japanese Biochemical Society, Ishikawa Building-3f, 25-16, Hongo 5-chome, Bunkyo-ku, Tokyo 113-0033, Japan. Tel. +81-3-3815-1913, Fax. +81-3-3815-1934

Subscription

The price for a subscription per year (two volumes) is US \$250.00 (postal surcharge airmail only, US \$60). Remittance should be made preferably by check or draft payable to the Japanese Biochemical Society. Subscriptions from abroad should be paid to the agencies listed below.

Agencies

Japan Publications Trading Co., Ltd. P.O. Box 5030, Tokyo International, 2-1, Sarugaku-cho 1-chome, Chiyoda-ku, Tokyo 101-0064, Japan	Maruzen Co., Ltd. P.O. Box 5050, Tokyo International, 100-3199, Japan
--	---

All back issues of the *Journal of Biochemistry* from Volume 1, 1922, are available from our agency: TOA BOOK EXPORTS, INC., Ikebukuro 4-13-4, Toshima-ku, Tokyo 171-0014, Japan. Tel. +81-3-3985-4701, Fax. +81-3-3985-4703

Copyright © 2001, by the Japanese Biochemical Society

Printed by Daishowa Printing Co., Ltd., Tokyo, Japan
under the supervision of
Center for Academic Publications Japan

Notice on photocopying With the exception of cases permitted by the Copyrights Law, such as the photocopying services provided by the libraries duly designated by government ordinance and photocopying for lectures by teachers at educational institutions, the photocopying of any part of this publication without explicit consent of the relevant author is a violation of the law. To legally photocopy any part of this publication, the person wishing to photocopy, or the corporation or organization employing such person, is recommended to enter into a comprehensive copyright approval agreement with the following trustee of copyrights from the authors:

(Except in the U.S.A.) The Copyright Council of the Academic Societies, 41-6, Akasaka 9-chome, Minato-ku, Tokyo 107-0052, Japan. Phone: 3-3475-4621, Fax: 3-3403-1738

(In the U.S.A.) Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, U.S.A. Phone: 508-750-8400, Fax: 508-750-4744

NOTES TO CONTRIBUTORS

The JOURNAL OF BIOCHEMISTRY publishes contributions, written in English, in the forms of (1) Regular paper and (2) Rapid communication, covering materials requiring prompt publication.

Submission of a paper implies that the work described has not been published previously, that it is not under consideration for publication elsewhere, and that if the paper is accepted for publication, the author(s) will transfer the copyright to the Japanese Biochemical Society.

Manuscripts should be written in succinct forms. No length-limit is set for a Regular paper, whereas a Rapid communication is not allowed to exceed 3.5 printed pages. Charges of ¥700 and ¥7,200 are made for every printed page of a Regular paper and a Rapid communication, respectively.

The manuscript should be typewritten in double-spacing and appropriately numbered. Submission of four copies of manuscript is requested. The manuscript should be sent to: The Japanese Biochemical Society, Ishikawa Building-3f, 25-16, Hongo 5-chome, Bunkyo-ku, Tokyo 113-0033, Japan.

Reprints can be purchased, in lots of 50 copies, at cost prices. The order for reprints should be made on returning the proof.

On submission of papers, authors are requested to select one of the following four fields and its topic, under which the submitted papers should be reviewed, and to indicate their selection on the title page of the manuscript. Authors may suggest a few names and addresses of potential reviewers, who are suitable for reviewing the submitted papers.

Fields and topics to be selected:

Fields	Topics
<i>Biochemistry:</i>	Biochemistry General
	Protein Structure
	Biomolecular Structures
	Nucleic Acid and Peptide Biochemistry
	Glycobiology and Carbohydrate Biochemistry
	Lipid Biochemistry
	Enzymology
	Biochemistry of Proteolysis
	Metabolism and Bioenergetics
	Reactive Oxygen and Nitrogen Species
	Biochemistry in Cell Membranes
	Biochemistry in Diseases and Aging
	Neurochemistry
	Immunochemistry
	Physiological Chemistry
	Biochemical Pharmacology
	Analytical Biochemistry
<i>Molecular Biology:</i>	Molecular Biology General
	Genes and Other Genetic Materials
	Replication and Recombination
	Gene Expression
	Protein Synthesis
	DNA-Protein Interaction
	RNA Processing
	Genetic Engineering
	Genetic Diseases
	Molecular Genetics
	Molecular Evolution

Fields

Topics

Cell: Cell General
Biomembranes, Organelles, and Protein Sorting
Muscles, Cell Motility and Shape
Extracellular Matrices and Cell Adhesion Molecules
Cell Cycle
Receptors and Signal Transduction
Stress Proteins and Molecular Chaperones
Cell Death
Differentiation, Development, and Aging
Neurobiology
Tumor and Immunology

Biotechnology: Biotechnology General
Biomimetic Chemistry
Biomaterials
Bioactive Substances
Gene and Protein Engineering
RNA Technology
Glycotechnology
Immunological Engineering
Cell and Tissue Engineering
Transgenic Technology
Drug Delivery Systems
Biosensor and Bioelectronics
New Devices in Biotechnology
Environmental Technology

"Instructions to Authors" are printed in the January and July issues of this JOURNAL every year. Please conform to these instructions when submitting manuscripts. Reprint of "Instructions to Authors" is available.

New Announcement (Limited Publication)

JOURNAL OF BIOCHEMISTRY, GENERAL CONTENTS

Volume 37-66 (1950-1969) Cloth Bound
700 page, including Author and Subject
Index US \$90.00

Volume 67-98 (1970-1985) Cloth Bound
1000 page, including Author and Subject
Index US \$120.00

Now available through: TOA BOOK EXPORTS, INC.,
Ikebukuro 4-13-4, Toshima-ku, Tokyo 171-0014, Japan.

CONTENTS Vol. 129, No. 2

JB Reviews

- SPT* Genes: Key Players in the Regulation of Transcription, Chromatin Structure and Other Cellular Processes Y. Yamaguchi, T. Narita, N. Inukai, T. Wada, and H. Handa 185
- Regulation of the Activities of Multifunctional Ca²⁺/Calmodulin-Dependent Protein Kinases H. Fujisawa 193

Rapid Communications

- Relocation of Cys374 of Actin Induced by Labeling with Fluorescent Dyes T. Yasunaga and T. Wakabayashi 201
- Crystal Structure of *meso*-2,3-Butanediol Dehydrogenase in a Complex with NAD⁺ and Inhibitor Mercaptoethanol at 1.7 Å Resolution for Understanding of Chiral Substrate Recognition Mechanisms M. Otagiri, G. Kurisu, S. Ui, Y. Takusagawa, M. Ohkuma, T. Kudo, and M. Kusunoki 205
- Planning of a Phage VH Library Using Nitrocellulose Membranes: Application to Selection of a Human VH Library M. Nakamura, H. Watanabe, Y. Nishimiya, K. Tsumoto, K. Ishimura, and I. Kumagai 209

Regular Papers

- Identification of a Rat 30-kDa Protein Recognized by the Antibodies to a Recombinant Rat Cutaneous Fatty Acid-Binding Protein as a 14-3-3 Protein S. Odani, J. Nakamura, T. Sato, and H. Fujii 213
- Carbohydrate Moiety of Time-Interval Measuring Enzyme Regulates Time Measurement through Its Interaction with Time-Holding Peptide PIN N. Tani, G. Kamada, K. Ochiai, M. Isobe, S. Suwan, and H. Kai 221
- A Serpin with *M_r* 43,000 Is a Binding Protein of *M_r* 25,000 Protein, a Substrate for Protein Ser/Thr Kinase Detected in *Xenopus laevis* Oocytes N. Goto, S. Muto, I. Sugimoto, K. Ikawa-Kitayama, K. Igarashi, S. Ito, and E. Hashimoto 229
- A Single-Chain Fv Fragment 2A3 Specific for Native Lysozyme: Isolation from a Human Synthetic Phage Display Antibody Library and Characterization M. Kikuchi, C. Takeda, Y. Tsujimoto, S. Asada, and K. Nagata 237
- Enzyme-Linked Immunosorbent Assay for the Determination of p21-Activated Kinase Activity J.-S. Yu, S.-H. Chang, W.-H. Chan, and H.-C. Chen 243
- Decreases of Metallothionein and Aminopeptidase N in Renal Cancer Tissues K. Ishii, S. Usui, H. Yamamoto, Y. Sugimura, M. Tatematsu, and K. Hirano 253
- Microsomal P450s Use Specific Proline-Rich Sequences for Efficient Folding, but Not for Maintenance of the Folded Structure K. Kusano, M. Sakaguchi, N. Kagawa, M.R. Waterman, and T. Omura 259
- Importance of a Proline-Rich Sequence in the Amino-Terminal Region for Correct Folding of Mitochondrial and Soluble Microbial P450s K. Kusano, N. Kagawa, M. Sakaguchi, T. Omura, and M.R. Waterman 271
- Purification, Molecular Cloning, and Immunohistochemical Localization of Dipeptidyl Peptidase II from the Rat Kidney and Its Identity with Quiescent Cell Proline Dipeptidase H. Araki, Y.-H. Li, Y. Yamamoto, M. Haneda, K. Nishi, R. Kikkawa, and I. Ohkubo 279
- Biosynthesis and Characterization of the Brain-Specific Membrane Protein DPPX, a Dipeptidyl Peptidase IV-Related Protein Y. Kin, Y. Misumi, and Y. Ikehara 289
- Study on the Biosynthesis of Dolichol in Yeast: Recognition of the Prenyl Chain Length in Polyprenol Reduction S. Tateyama and H. Sagami 297

Crystal Structure of Glucose Dehydrogenase from <i>Bacillus megaterium</i> IWG3 at 1.7 Å Resolution	K. Yamamoto, G. Kurisu, M. Kusunoki, S. Tabata, I. Urabe, and S. Osaki	303
Leupeptin-Induced Appearance of Partial Fragment of Betaine Homocysteine Methyltransferase during Autophagic Maturation in Rat Hepatocytes	N. Furuya, T. Kanazawa, S. Fujimura, T. Ueno, E. Kominami, and M. Kadowaki	313
Interaction between Emerin and Nuclear Lamins	M. Sakaki, H. Koike, N. Takahashi, N. Sasagawa, S. Tomioka, K. Arahata, and S. Ishiura	321
Regulatory Mechanism for the Stability of the Meta II Intermediate of Pinopsin	A. Nakamura, D. Kojima, T. Okano, H. Imai, A. Terakita, Y. Shichida, and Y. Fukada	329

Author Index

- Arahata, K., 321
Araki, H., 279
Asada, S., 237
- Chan, W.-H., 243
Chang, S.-H., 243
Chen, H.-C., 243
- Fujii, H., 213
Fujimura, S., 313
Fujisawa, H., 193
Fukada, Y., 329
Furuya, N., 313
- Goto, N., 229
- Handa, H., 185
Haneda, M., 279
Hashimoto, E., 229
Hirano, K., 253
- Igarashi, K., 229
Ikawa-Kitayama, K., 229
Ikehara, Y., 289
Imai, H., 329
Inukai, N., 185
Ishii, K., 253
- Ishimura, K., 209
Ishiura, S., 321
Isobe, M., 221
Ito, S., 229
- Kadowaki, M., 313
Kagawa, N., 259, 271
Kai, H., 221
Kamada, G., 221
Kanazawa, T., 313
Kikkawa, R., 279
Kikuchi, M., 237
Kin, Y., 289
Koike, H., 321
Kojima, D., 329
Kominami, E., 313
Kudo, T., 205
Kumagai, I., 209
Kurusu, G., 205, 303
Kusano, K., 259, 271
Kusunoki, M., 205, 303
- Li, Y.-H., 279
- Misumi, Y., 289
Muto, S., 229
Nagata, K., 237
- Nakamura, A., 329
Nakamura, J., 213
Nakamura, M., 209
Narita, T., 185
Nishi, K., 279
Nishimiya, Y., 209
- Ochiai, K., 221
Odani, S., 213
Ohkubo, I., 279
Ohkuma, M., 205
Okano, T., 329
Omura, T., 25, 271
Osaki, S., 303
Otagiri, M., 205
- Sagami, H., 297
Sakaguchi, M., 259, 271
Sakaki, M., 321
Sasagawa, N., 321
Sato, T., 213
Shichida, Y., 329
Sugimoto, I., 229
Sugimura, Y., 253
Suwan, S., 221
- Tabata, S., 303
- Takahashi, N., 321
Takeda, C., 237
Takusagawa, Y., 205
Tani, N., 221
Tatematsu, M., 253
Tateyama, S., 297
Terakita, A., 329
Tomioka, S., 321
Tsumimoto, Y., 237
Tsumoto, K., 209
- Ueno, T., 313
Ui, S., 205
Urabe, I., 303
Usui, S., 253
- Wada, T., 185
Wakabayashi, T., 201
Watanabe, H., 209
Waterman, M.R., 259, 271
- Yamaguchi, Y., 185
Yamamoto, H., 253
Yamamoto, K., 303
Yamamoto, Y., 279
Yasunaga, T., 201
Yu, J.-S., 243