

**ANNUAL REPORTS
OF
INTERNATIONAL CENTER FOR BIOTECHNOLOGY
OSAKA UNIVERSITY**

VOL. 36, 2014

DIRECTOR/EDITOR	TAKUYA NIHIRA
ASSISTANT EDITOR	KAZUHITO FUJIYAMA
	SHIGERU KITANI
	RYO MISAKI
	HIROSHI KINOSHITA
	TAKAO OHASHI
SECRETARY	NOZOMI YOKOI
	FUMIKO TOMOMATSU
	CHIYOKO KATAYAMA
	HITOMI YUMIOKA
	SHIZUKA KAWAKAMI

The Annual Report is published to record the activity of the International Center for Biotechnology (ICBiotech) and issued once in each fiscal year. It contains scientific articles, progress reports, letters, and announcement from the Center. This volume includes publications by the former participants in UNESCO courses. The editor welcomes the submission of appropriate articles from all persons who are concerned with the activity of the Center. All the contributions, however, will be reviewed by editors before their acceptance. The scientific paper herein should be treated as personal communications and not treated as original publications. The Annual Report is distributed upon request to the International Center for Biotechnology, Osaka University, 2-1 Yamadaoka, Suita, Osaka 565-0871, Japan (e-mail: info_icbio@icb.osaka-u.ac.jp).

CONTENTS

Differential Contributions of Two SARP Family Regulatory Genes to Indigoidine Biosynthesis in <i>Streptomyces lavendulae</i> FRI-5 <i>Y. N. Kurniawan, S. Kitani, A. Maeda, and T. Nihira</i>	1
Identification of a Gene Cluster Responsible for the Biosynthesis of Cyclic Lipopeptide Verlamelin <i>K. Ishidoh, H. Kinoshita, and T. Nihira</i>	10
List of Publication: Takuya Nihira	11
Production of Initial-stage Eukaryotic <i>N</i> -glycan and Its Protein Glycosylation in <i>Escherichia coli</i> <i>A. Srichaisupakit, T. Ohashi, R. Misaki, and K. Fujiyama</i>	12
<i>N</i> -glycosylation of Cholera Toxin B Subunit in <i>Nicotiana benthamiana</i> : Impacts on Host Stress Response, Production Yield and Vaccine Potential <i>K. T. Hamorsky, J. C. Kouokam, J. M. Jurkiewicz, B. Nelson, L. J. Moore, A. S. Husk, H. Kajiura, K. Fujiyama, and N. Matoba</i>	19
List of Publication: Kazuhito Fujiyama	20
Simultaneous Anammox and Denitrification (SAD) Process in Sequencing Batch Reactors <i>M. Takekawa, G. Park, S. Soda, and M. Ike</i>	21
Polyhydroxyalkanoate (PHA) Accumulation Potential and PHA-accumulating Microbial Communities in Various Activated Sludge Processes of Municipal Wastewater Treatment Plants <i>K. Sakai, S. Miyake, K. Iwama, D. Inoue, S. Soda, and M. Ike</i>	29
List of Publication: Michihiko Ike	30
Genome-wide Mapping of Unexplored Essential Regions in the <i>Saccharomyces cerevisiae</i> Genome: Evidence for Hidden Synthetic Lethal Combinations in a Genetic Interaction Network <i>S. Kaboli, T. Yamakawa, K. Sunada, T. Takagaki, Y. Sasano, M. Sugiyama, Y. Kaneko, and S. Harashima</i>	31
Nuclear Localization of Haa1, Which Is Linked to Its Phosphorylation Status, Mediates Lactic Acid Tolerance in <i>Saccharomyces cerevisiae</i> <i>M. Sugiyama, S. Akase, R. Nakanishi, H. Horie, Y. Kaneko, and S. Harashima</i>	47
List of Publication: Satoshi Harashima	48
<i>In vitro</i> Conversion of Glycerol to Lactate with Thermophilic Enzymes <i>C. Jaturapaktrarak, S. C. Napathorn, M. Cheng, K. Okano, H. Ohtake, and K. Honda</i>	49
Assembly and Multiple Gene Expression of Thermophilic Enzymes in <i>Escherichia Coli</i> for In Vitro Metabolic Engineering <i>P. H. Ninh, K. Honda, T. Sakai, K. Okano, and H. Ohtake</i>	57
List of Publication: Hisao Ohtake	58
Kinetic Analysis of Deviation from the Undifferentiated State in Colonies of Human Induced Pluripotent Stem Cells on Feeder Layers <i>M.-H. Kim, E. Masuda, and M. Kino-oka</i>	59
Switching between Self-renewal and Lineage Commitment of Human Induced Pluripotent Stem Cells via Cell–substrate and Cell–cell Interactions on a Dendrimer-immobilized Surface <i>M.-H. Kim and M. Kino-oka</i>	70
List of Publication: Masahiro Kino-oka	71

Diversity of Culturable Yeasts in Phylloplane of Sugarcane in Thailand and Their Capability to Produce Indole-3-acetic Acid <i>S. Limtong, R. Kaewwichian, W. Yongmanitchai, and H. Kawasaki</i>	72
<i>Barnettozyma siamensis</i> f.a., sp. nov., a Lipid-accumulating Ascomycete Yeast Species <i>P. Polburee, W. Yongmanitchai, T. Ohashi, K. Fujiyama, and S. Limtong</i>	84
Gene Polymorphisms of Interleukin 28B and the Risk to Chronic Hepatitis B Virus Infection in Thai <i>I. Kimkong, J. Chankaew, A. Kunanopparat, N. Hirankarn, and P. Tangkijvanich</i>	85
<i>IFNARI</i> Gene Polymorphism Associated with Chronic Hepatitis B Virus Infection in a Thai Population <i>S. Phuengwas, V. Hongtrakul, N. Hirankarn, P. Tangkijvanich, C. Pothiratana, and I. Kimkong</i>	90
Emulsification Efficiency of Adsorbed Chitosan for Bacterial Cells Accumulation at the Oil–water Interface <i>S. Archakunakorn, N. Charoenrat, S. Khamsakhon, T. Pongtharangkul, P. Wongkongkatep, M. Suphantharika, and J. Wongkongkatep</i>	91
Rapid and Quantitative Fluorescence Detection of Pathogenic spore-forming Bacteria Using a Xanthene-Zn(II) Complex Chemosensor <i>P. Tiposoth, S. Khamsakhon, N. Ketsub, T. Pongtharangkul, I. Takashima, A. Ojida, I. Hamachi, and J. Wongkongkatep</i>	100
List of Publication: Thunyarat Pongtharangkul	100
PUBLICATIONS by Former Participants in UNESCO International Post-Graduate University Course in Microbiology (UM), UNESCO Postgraduate Inter-University Course in Biotechnology (UB), and UNESCO Training Project supported by ODA Grants for UNESCO Activities, MEXT (UO)	
Non-target Effects of Bioinoculants on Rhizospheric Microbial Communities of <i>Cajanus cajan</i> <i>R. Gupta, N. Mathimaran, A. Wiemken, T. Boller, V. S. Bisaria, and S. Sharma</i>	101
Which Milk Is Fresh? <i>V. L. Barraquio</i>	109
Accreditation of Microbiologists in the Food and Pharmaceutical Industries <i>V. L. Barraquio</i>	115
Spirotetronate Antibiotics with Anti- <i>Clostridium</i> Activity from <i>Actinomadura</i> sp. 2EPS <i>J. Euanorasetr, B. Intra, P. Mongkol, S. Chankhamhaengdech, P. Tuchinda, M. Mori, K. Shiomi, T. Nihira, and W. Panbangred</i>	119
Viscoelastic, Spectroscopic, and Microscopic Characterization of Novel Bio-Based Plasticized Poly(vinyl chloride) Compound <i>M. C. Sin, I. K. P. Tan, M. S. M. Annuar, and S. N. Gan</i>	127
Characterization of Affinity-Purified Isoforms of <i>Acinetobacter calcoaceticus</i> Y1 Glutathione Transferases <i>C.-S. Chee, I. K.-P. Tan, and Z. Alias</i>	137
List of Publication: Irene Kit Ping Tan	138
<i>Pueraria mirifica</i> Leaves, an Alternative Potential Isoflavonoid Source <i>J. Jung sukcharoen, B. A. Dhiani, W. Cherdshewasart, N. Vinayavekhin, P. Sangvanich, and C. Boonchird</i>	139
Two New Anti-apoptotic Proteins of White Spot Syndrome Virus That Bind to an Effector Caspase (<i>PmCasp</i>) of the Giant Tiger Shrimp <i>Penaeus (Penaeus) monodon</i>	

<i>T. Lertwimol, P. Sangsuriya, K. Phiwsaiya, S. Senapin, A. Phongdara, C. Boonchird, and T. W. Flegel</i>	149
9- <i>O</i> -butyl-13-(4-isopropylbenzyl)berberine, KR-72, Is a Potent Antifungal Agent That Inhibits the Growth of <i>Cryptococcus neoformans</i> by Regulating Gene Expression <i>S. Bang, H. Kwon, H. S. Hwang, K. D. Park, S. U. Kim, and Y.-S. Bahn</i>	150
Isolation of Thermophilic L-lactic Acid Producing Bacteria Showing Homo-fermentative Manner under High Aeration Condition <i>S. Tongpim, R. Meidong, P. Poude, S. Yoshino, Y. Okugawa, Y. Tashiro, M. Taniguchi, and K. Sakai</i>	161
Isolation and Study of Thermotolerant <i>Bacillus</i> Strains Including L-lactic Acid Production from Kitchen Refuse <i>S. Tongpim and K. Sakai</i>	168
<i>In silico</i> Identification of Potential Inhibitors of Dengue Mosquito, <i>Aedes aegypti</i> Chorion Peroxidase <i>E. P. Alcantara</i>	169
Draft Genome Sequence of Insecticidal <i>Streptomyces</i> sp. Strain PCS3-D2, Isolated from Mangrove Soil in Philippines <i>A. N. Bayot-Custodio, E. P. Alcantara, and T. O. Zulaybar</i>	174
Legume Nodulating Bacterium, <i>Achromobacter xylosoxidans</i> Found in Tropical Shrub Agroecosystem, Sumatera, Indonesia <i>S. Wedhastri, D. M. Fardhani, S. Kabirun, J. Widada, D. Widiyanto, R. Evizal, and I. D. Prijambada</i>	175
Genome Analysis of a Novel <i>Bradyrhizobium</i> sp. DOA9 Carrying a Symbiotic Plasmid <i>S. Okazaki, R. Noisangiam, T. Okubo, T. Kaneko, K. Oshima, M. Hattori, K. Teamtisong, P. Songwattana, P. Tittabutr, N. Boonkerd, K. Saeki, S. Sato, T. Uchiumi, K. Minamisawa, and N. Teaumroong</i>	182
Proposed Some Interactions at Molecular Level of PGPR Coinoculated with <i>Bradyrhizobium diazoefficiens</i> USDA110 and <i>B. japonicum</i> THA6 on Soybean Symbiosis and Its Potential of Field Application <i>J. Prakamhang, P. Tittabutr, N. Boonkerd, K. Teamtisong, T. Uchiumi, M. Abe, and N. Teaumroong</i>	200
List of Publication: Neung Teaumroong	201
High-level Pullulan Production by <i>Aureobasidium pullulans</i> var. <i>melanogenium</i> P16 Isolated from Mangrove System <i>Z.-C. Ma, W.-J. Fu, G.-L. Liu, Z.-P. Wang, and Z.-M. Chi</i>	202
Heavy Oils, Principally Long-chain <i>n</i> -alkanes Secreted by <i>Aureobasidium pullulans</i> var. <i>melanogenium</i> Strain P5 Isolated from Mangrove System <i>Y.-Y. Liu, Z. Chi, Z.-P. Wang, G.-L. Liu, and Z.-M. Chi</i>	211
List of Publication: Zhen-Ming Chi	212
The C-terminal Region of Xylanase Domain in Xyn11A from <i>Paenibacillus curdolanolyticus</i> B-6 Plays an Important Role in Structural Stability <i>J. Sermsathanaswadi, S. Pianwanit, P. Pason, R. Waeonukul, C. Tachaapaikoon, K. Ratanakhanokchai, K. Septiningrum, and A. Kosugi</i>	213
Zinc Cluster Protein Znf1, a Novel Transcription Factor of Non-fermentative Metabolism in <i>Saccharomyces cerevisiae</i> <i>P. Tangsombatvichit, M. V. Semkiv, A. A. Sibirny, L. T. Jensen, K. Ratanakhanokchai, and N. Soontorngun</i>	224
List of Publication: Khanok Ratanakhanokchai	225

Stepwise Metabolic Engineering of <i>Gluconobacter oxydans</i> WSH-003 for the Direct Production of 2-keto-L-gulonic Acid from D-sorbitol <i>L. Gao, Y. Hu, J. Liu, G. Du, J. Zhou, and J. Chen</i>	226
Efficient Synthesis of Eriodictyol from L-Tyrosine in <i>Escherichia coli</i> <i>S. J. Zhu, J. J. Wu, G. C. Du, J. W. Zhou, and J. Chen</i>	234
List of Publication: Jian Chen	235
Cloning, Characterization, and Heterologous Expression of a Dextranase Gene from <i>Penicillium pinophilum</i> SMCU3-14 <i>P. Rerngsamran, P. Temjitpukdee, N. Assavasirijinda, S. Chareonpornwattana, and S. Thaniyavarn</i>	236
Biocompatibilities and Biodegradation of Poly(3-hydroxybutyrate-co-3-hydroxyvalerate)s Produced by a Model Metabolic Reaction-based System <i>S. C. Napathorn</i>	245
Optimal Production of a Fusion Protein Consisting of a Single-chain Variable Fragment Antibody Against a Tumor-associated Antigen and Interleukin-2 in Fed-batch Culture of <i>Pichia pastoris</i> <i>S. Anuleejun, T. Palaga, Y. Katakura, M. Kuroki, M. Kuroki, and S. C. Napathorn</i>	260
List of Publication: Suchada Chanprateep Napathorn	261
Characterization of Intergeneric Conjugation and <i>attB</i> Site for Molecular Genetic Studies of <i>Streptomyces scabies</i> ATCC 23962 <i>S.-U. Choi and T. Nihira</i>	262
Optimization of Transconjugation and Characterization of <i>attB</i> Integration Site for <i>Streptomyces cinnamoneus</i> Producing Transglutaminase <i>J.-Y. Park and S.-U. Choi</i>	269
List of Publication: Sun-Uk Choi	269
Role of Hepatitis B Virus DNA Integration in Human Hepatocarcinogenesis <i>H. Hai, A. Tamori, and N. Kawada</i>	270
Effects on Anemia of Drug Adjustment in Patients with Chronic Hepatitis C during Telaprevir-combined Therapy <i>A. Tamori, K. Kioka, H. Sakaguchi, M. Enomoto, H. Hai, E. Kawamura, A. Hagihara, H. Fujii, S. Uchida-Kobayashi, S. Iwai, H. Morikawa, Y. Murakami, Y. Kawasaki, D. Tsuruta, and N. Kawada</i>	278
Identification of Type II and III DDR2 Inhibitors <i>A. Richters, H. D. Nguyen, T. Phan, J. R. Simard, C. Grütter, J. Engel, and D. Rauh</i>	279
Discovery of Inter-domain Stabilizers—A Novel Assay System for Allosteric Akt Inhibitors <i>Z. Fang, J. R. Simard, D. Plenker, H. D. Nguyen, T. Phan, P. Wolle, S. Baumeister, and D. Rauh</i>	290
Divergent <i>Nod</i> -Containing <i>Bradyrhizobium</i> sp. DOA9 with a Megaplasmid and Its Host Range <i>K. Teamtisong, P. Songwattana, R. Noisangiam, P. Piromyou, N. Boonkerd, P. Tittabutr, K. Minamisawa, A. Nantagij, S. OKazaki, M. Abe, T. Uchiumi, and N. Teaumroong</i>	291
Preferential Association of Endophytic Bradyrhizobia with Different Rice Cultivars and Its Implications for Rice Endophyte Evolution <i>P. Piromyou, T. Greetatorn, K. Teamtisong, T. Okubo, R. Shinoda, A. Nuntakij, P. Tittabutr, N. Boonkerd, K. Minamisawa, and N. Teaumroong</i>	298
List of Publication: Kamonluck Teamtisong	299

Generation Mean Effects, Heterosis and Heritabilities for Seedling, Adult and Physiological Salinity Tolerance in Spring Wheat (<i>Triticum aestivum</i>) <i>Z. Ali, A. S. Khan, I. Karim, M. Uzair, T. Mahmood, T. Saeed, S. Sarwar, N. Ghori, Z. Nisar, S. S. Sarwat, A. Qayyum, and A. A. Khan</i>	300
Discrimination between Active and Latent Tuberculosis Based on Ratio of Antigen-Specific to Mitogen-Induced IP-10 Production <i>Y. H. Jeong, Y.-G. Hur, H. Lee, S. Kim, J.-E. Cho, J. Chang, S. J. Shin, H. Lee, Y. A. Kang, S.-N. Cho, and S.-J. Ha</i>	308
Physical and Storage Properties of Spray-dried Blueberry Pomace Extract with Whey Protein Isolate as Wall Material <i>F. P. Flores, R. K. Singh, and F. Kong</i>	315
Characterization of Alkaline-cooked Quality Protein Maize as Raw Material for Noodle Processing <i>M. A. D. R. Bibat, O. M. Del Rosario, L. E. Mopera, L. S. Collado, and F. P. Flores</i>	321
Activities of International Center for Biotechnology for 2014	323
Author Index	339