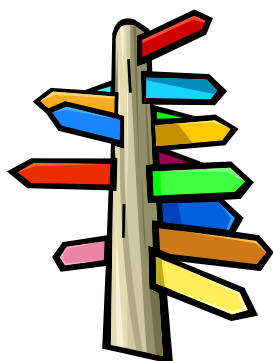




生命化学研究 レター

No. 13 (2004 年 1 月)

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巻頭言

新しいステップに...

大阪大学大学院工学研究科
和田 健彦

2004 年が始まりました。2003 年は皆様ご存じのように生命化学、そして生命化学研究会にとって記念すべき年となりました。まず生命化学にとってはヒトゲノム・シーケンシングプロジェクトが完了し、ヒト遺伝子の信頼性の高い全配列が決定されました。これから本格的に始まる遺伝子配列解析により膨大な情報・機能が明らかにされていくことが期待されますが、既に数多くの疾患・疾病遺伝子、ガン遺伝子や機能性遺伝子が明らかとされ、遺伝子工学・分子生物学の飛躍的な発展に貢献するのみならず、遺伝子診断、オーダーメイド医薬品の開発などへの展開も精力的に検討されています。当初 DNA RNA タンパク質へと一方向な生命情報の流れ、セントラルドグマに基づきヒト DNA の全遺伝子配列を決定することができれば、人間の生命情報設計図が明らかとなり、DNA エクソンと各タンパク質一次構造の一対一対応はもちろんのこと、その発現制御機構やリン酸化、糖鎖合成などの情報制御プログラムまでが明らかになるとの期待が一般の方のみならず、一部の研究者からも寄せられていました。しかし、10 万種類程度と推測されているタンパク質数に対して、明らかとされたエクソンの概数は 34000 程度と約 1/3 しかなく、エクソンシャッピング・組み替えによるアミノ酸配列のコーディングや、一つのエクソンが複数種類のタンパク質一次情報をコードしている可能性が確認され、当然ですが生命情報は遺伝子配列だけで全てが決定されるのではなく、酵素・タンパク質、糖質などとの相互作用や環境などの後天的因子によっても大きく左右されることが明らかとなりました。つまりヒトゲノム・シーケンシングプロジェクトの完了は、バイオインフォマティクス(生命情報科学・生体機能情報学・生物資源情報基盤)への新しいステップと考えられます。

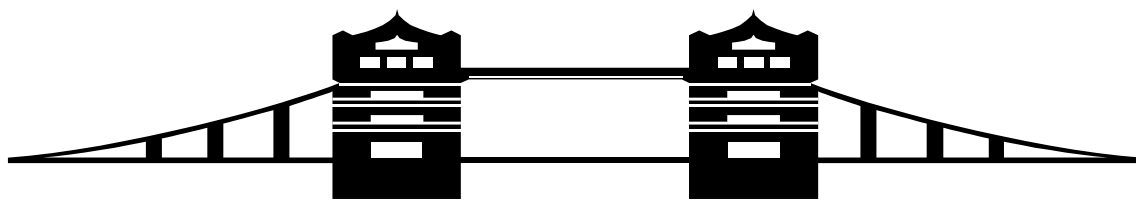
一方、生命化学研究会にとっても 2003 年は記念すべき年となりました。生命化学研究会第 2 期目の大きな目標として会員の皆様とともに企画・運営活動を進めて参りました国際シンポジウム、International Symposium on Biomolecular Chemistry 2003 (ISBC2003)を、馬場会長を運営委員長として兵庫県立夢舞台国際会議場で開催することができ、23 件の招待講演と 124 件のポスター発表が行われ、世界 15 カ国から 210 名もの方に御参加いただきました。I. Functional DNA/RNA, II. Cell Function of Macromolecules, III. Metals in Chemical Biology, IV. Protein-Protein Interaction, V. Technology Innovation in Biomolecular Chemistry の 5 セッションの招待講演では、文字通り生命化学の世界トップレベルの研究成果を拝聴することができ、自然と質疑応答にも熱がこもり、大変盛り上がりました。招待講演・質疑応答により、多くの参加者は知的好奇心を大いに満足させるとともに、化学者の視点から生命現象解明・生命機能制御に取り組むことの素晴らしさに感動し、モチベーションを奮い立たせる素晴らしい時間を過ごすことができました。ポスターも、第一回生命化学研究会国際シンポジウムに相応しい国際色にも富む内容の濃い発表が多く、組織委員・プログラム委員が 6 名のポスター賞該当者を選択するのに大いに苦労しました。また、この国際シンポジウ

ムの内容は、丸善出版から Biomolecular Chemistry – A Bridge for the Future – と題する 400 ページを超える本として出版されました。このように組織委員・プログラム委員の皆様のご尽力と会員の皆様のご協力により、生命化学研究会として期待以上の国際シンポジウム開催を実現することができ、組織委員の一人としてこの場をお借りして心から御礼申し上げます。

このように生命化学研究会は杉本直己初代会長、現馬場嘉信会長のご尽力・リーダーシップならびに役員・会員の皆様のご協力により第一期の目標である成書の発行、第二期の目標である国際シンポジウムの開催とも予想以上の成果を上げ、順調に発展していると思います。しかし、第二期目を終えようとした 2004 年、21 世紀における生命化学研究会の発展的飛躍を実現するためには・・・このままでいいのでしょうか？

1998 年 3 月「生命および生体分子の関与する化学」を基礎から応用まで広く研究・展開し、関連学問ならびに利用技術の一層の発展を図ることを目的に設立された時、生命化学研究会は 1. 平均年齢が若い 2. ヘテロな集団である この二つの特長を有していると杉本会長が指摘されています。若いと言うことは、既成概念にとらわれず、斬新な企画・アイデアに富んでいることを、ヘテロな集団であることにより画一的でなく色々な視点からの意見・アイデアが期待出来ることを意味されていると思います。実際に第一期・第二期において従来の研究会には見られない、斬新な企画・運営が実現されてきたと思います。しかし 3 年の研究会準備段階から数えると足かけ 10 年の月日が過ぎようとしています。ヘテロな集団であった研究会メンバーも顔なじみとなり、いい意味でも悪い意味でもホモジニアスな集団になってきている気がしないでもありません。また物理的に年齢も重ねてきています、もちろん精神年齢は皆さんまだまだ若く、学生より元気な方もいらっしゃいますが…。ISBC2003 国際シンポジウムを盛会に終えた今こそ、もう一度設立時の原点に戻り若干形式化しつつ感のある企画、シンポジウム、ニュースレター、研究会運営を見直し、色々な考え方を受け入れる「脇は甘く、懐の広い」研究会に立ち戻る必要が有るようにも感じます。第三期の浜地 格新会長の下、意見・方向性を一つにまとめる必要はなく、失敗してもいいから色々な企画やアイデアを試してもいいのではないのでしょうか？その中から、新しい方向性・意見が出てくる、でもその方向性などにも固執することなく、軽やかにフレキシブルに変化していく...それがヘテロな集団の持つ強みで有り、飛躍的な発展を遂げる重要なファクターでは...と思います。私は以前から一見関連はないと思われる異分野を融合した時こそ、大きな発展が期待されることを信じて研究を行ってきました。ポスト・ゲノムシーケンスの今こそ、真の意味でのヘテロな集団に立ち戻り、純粋な分子生物学・生物学を専門とする研究者にも参加頂き、化学者の得意とする分子レベルでの生命現象の理解という視点と融合することにより、Specialize された個々の生命現象の解明とその一般化・支配原理の解明いわゆる Generalize のバランスがとれた「生命および生体分子の関与する化学」研究の飛躍的な発展を実現しましょう。また、これからどんどん知的好奇心と向上心に富んだ若い研究者にも研究会に参加頂き、研究者の年齢的にもヘテロな集団でありたいですね。この研究会の本質は、研究成果を求めるだけでなく、それ以上に研究者が自分の知的好奇心を満足させ、自分の向上心を煽ることにあると思いますから・・・

2004 年、生命化学研究会も新たなステップを・・・



第1回生命化学国際シンポジウム (ISBC 2003) 報告書

First International Symposium on Biomolecular Chemistry

ISBC2003 組織委員会 委員長 馬場嘉信

2003年12月2日(火)～5日(金)、兵庫県立淡路夢舞台国際会議場において、上記国際会議を、ISBC 2003 組織委員会(委員長 馬場嘉信)の主催で開催した。この会議は、生命化学関連の基礎的学術研究、生命分子を利用した薬物設計、さらには新規かつ広義の機能材料学の基礎と応用に関する会議であり、世界で初めて、日本化学会生命化学研究会の主催で、わが国で開催したものである。

日本化学会生命化学研究会は、生命現象を化学あるいは分子の観点からとらえ、生命現象の本質を化学的に理解すること、ならびに生体機能に学びあるいはそれを応用し、生体分子由来の新しい機能分子の創製を行うことを目的としている。特にヒトゲノム解析の進展を踏まえ、単に生命を真似るのではなく、思うがままの構造・機能を有する分子・分子システムを創製・構築する“テラーメイド・バイオケミストリー”の実現を提唱している。さらに、核酸、タンパク質、糖、細胞などの各分野で活躍する様々なバックグラウンドを有する生命化学研究者が情報交換・議論を行い、分子レベルでの生体分子間での相互作用を明らかにすることにより生命化学の「ニューセントラルドグマ」を構築できるのではないかと考えている。これらの成果を応用することにより、SNPsをはじめとする遺伝子診断・検出法の創製、さらにはゲノム創薬のみならずプロテオーム、グリコーム情報に基づいた創薬をはじめとする従来法とは全く異なるような方法論を提唱できると考えている。我が国における生命化学研究者は多数におよび、特に近年我が国の研究者の活躍はめざましいものがあり、生命化学に関する基礎および応用研究に関する世界第一線の研究者が一堂に会し、更なる最新の研究成果および今後の展開について発表、意見交換を行い、当該分野における国際的交流と発展を促進することを目的として、第1回生命化学国際シンポジウム (ISBC2003) を淡路島において開催したものである。

本会議は、DNA、たんぱく質、ペプチド、糖鎖、生体関連高分子、細胞などの生命化学的研究ならびにその応用に関する研究発表と意見交換の場を提供するために、本分野研究の最先端の研究者 25 名で構成されるプログラム委員会において、(1) 機能性 DNA・RNA、(2) 生体・合成高分子の細胞機能、(3) 金属イオンの化学生物学、(4) タンパク質—タンパク質相互作用、および(5) 生命化学における技術革新の5領域を中心的課題として取り上げ、基礎から応用に至る広い範囲を研究発表および討論の対象とした。まず、それぞれの領域で、世界的に活躍している比較的若手の研究者 23 名を招待講演者として選んだ。

また、124 件のアブストラクトが投稿され、6 月末にプログラム委員会において、各アブストラクトの審査と分野の選定を行った。このように今回の学会は、世界中から選りすぐられた重要な研究発表が多数発表され、生命化学における世界の最先端の研究の状況を把握する上で欠かすことのできない学会となった。さらに、学会参加者も 200 名以上となった。

口頭発表では、非常に幅広い研究分野における世界最先端の研究結果が発表され活発な討論が展開された。また、ポスター会場も2時間のポスター発表時間中ずっと会場が満員の状態で大変熱気に満ち溢れた学会となった。発表内容は、(1) 機能性DNA・RNAが招待講演4件、ポスター発表29件、(2) 生体・合成高分子の細胞機能が、招待講演4件、ポスター発表17件、(3) 金属イオンの化学生物学が、招待講演5件、ポスター発表19件、(4) タンパク質—タンパク質相互作用が、招待講演4件、ポスター発表35件、および(5) 生命化学における技術革新が、招待講演6件、ポスター発表24件、と各分野バランスよく発表がなされた。

この会議は、まさに生命化学の基礎と応用を中心課題に据えた世界で唯一の国際会議であった。DNA、たんぱく質、糖鎖、細胞にいたる幅広い範囲において、この会議は、その学術的意義とともに、将来のゲノム情報に基づく総合的健康管理を実現するという社会的な意義を併せ持つ点に特色があった。生命化学国際会議の初めての日本開催は、最近のわが国の研究者の研究成果に対する国際的評価の反映であり、今回とくにわが国の貢献が顕著である分野の進歩を中心的な課題として取り上げることは、これらの分野の一層の発展をもたらすものと期待される。また、生命化学に関する国際会議を、バイオ分野研究進展の著しいアジアで開催できたことは、国際的にも意義深いものと考えられる。

本会議の内容は、研究発表と討論の成果を世界に公表するために丸善からプロシーディングスとして発行した[1]。各発表者が、各研究内容を 2-6 ページにまとめたもので、400 ページにもおよぶ本となっている。

本会議終了後には、世界中の研究者から、本会議が、史上最も価値のある会議であったとの賞賛を多数いただいている。

[1] Scientific Program Committee of ISBC 2003 (Ed.), *Biomolecular Chemistry*, Maruzen, 2003, pp. 1-387.



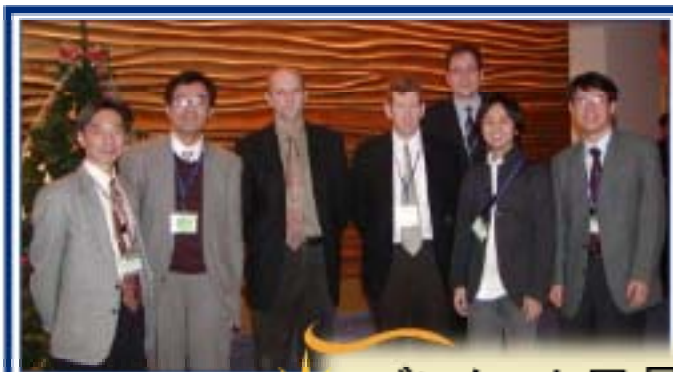
グラビアページ
写真で見る第1回生命化学国際会議



シンポジウム会場での集合写真



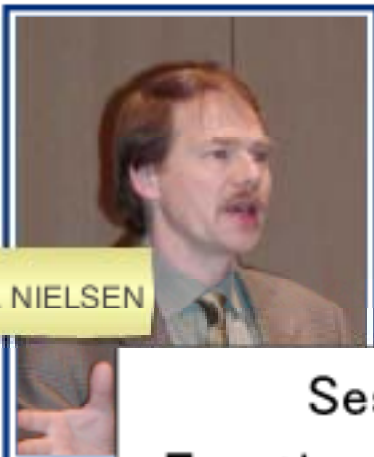
ウェルカム
レセプション
(Dec. 2nd)



★ バンケット風景(Dec. 4th) ★



左から、挨拶する
藤井郁雄氏、
杉本直己氏、
Prof. Don Hilvert、
浜地 格氏



Peter E. NIELSEN



Hiroaki SUGA

Session I
Functional DNA/RNA



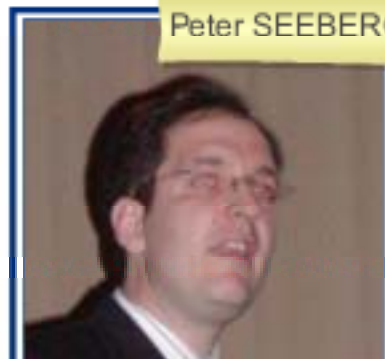
Byeang Hyeon KIM



Yoshihiro YONEDA



Reiji KANNAGI



Peter SEEBERGER

Session II
Cell Function of Macromolecules



Chung-Hung LIN



Kay-Hooi KHOO



Shigetoshi AONO



David P. FAIRLIE



Shinobu ITOH

Session III
Metals in Chemical Biology



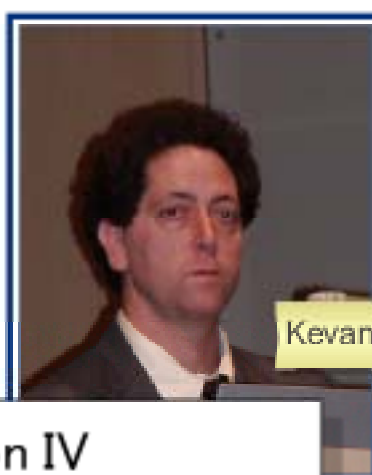
Shun HIROTA



David P. GIEDROC

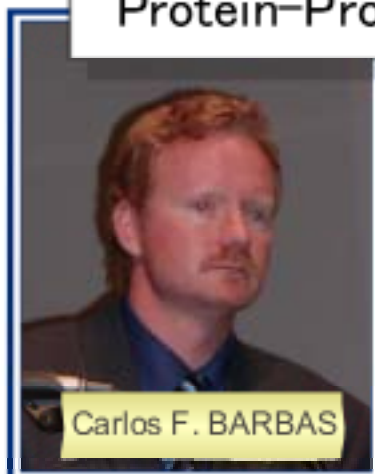


Shao Q. Yao

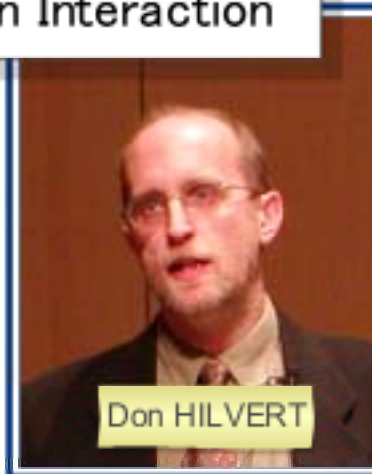


Kevan M. SHOKAT

Session IV
Protein-Protein Interaction



Carlos F. BARBAS



Don HILVERT



Young-Tae CHANG



Tom W. MUIR



Hisashi ARIKUNI

Session V
Technology Innovation
in Biomolecular Chemistry



Yoon-Sik LEE



Shigeori TAKENAKA



Yoshinobu BABA



★ シンポジウム風景 ★



BIOMOLECULAR CHEMISTRY

– A Bridge for the Future –



Awaji Yumebutai International Conference Center, Hyogo, Japan

December 2-5, 2003

*Organized by
the Forum on Biomolecular Chemistry,
the Chemical Society of Japan*

nanonet
Nanotechnology Researchers Network Center of Japan



PREFACE

The First International Symposium on Biomolecular Chemistry (ISBC2003) will be dedicated to the latest scientific and technological developments in the diverse fields of modern chemical research into DNA/RNA, proteins, carbohydrates and metals, with particular emphasis on understanding and controlling the phenomena in living systems.

ISBC 2003 is organized by the Forum on Biomolecular Chemistry, the Chemical Society of Japan. In 1996, the discussion group on Biomolecular Chemistry was formed by young, active and motivated scientists with a chemistry-based approach to biology, inspiring a number of meetings to discuss the future of Biomolecular Chemistry: Kumamoto (1996), Hakone (1997), and Tokushima (1998). Arising from these discussion meetings, in 1998 the group proposed and organized the Forum on Biomolecular Chemistry within the Chemical Society of Japan, one of the largest scientific societies in the world. The first symposium on Biomolecular Chemistry was held in Okazaki in 1999, bringing together scientists interested in biology-oriented chemical studies on DNA/RNA, proteins, carbohydrates, metals and cells; this was succeeded by the second symposium held in Osaka in 2000, and the third symposium held in Kobe in 2001. During these meetings, the members of the Forum discussed the future perspectives of this field in the post-genome sequencing era and the twenty first century. Arising from the realization of the multi-disciplinary and multi-national nature of this scientific area it was decided to organize the first International Symposium on Biomolecular Chemistry in 2003, whilst continuing to discuss what the future concepts of Biomolecular Chemistry at the fourth symposium held in Yokohama in 2001 and the fifth symposium held in Uji in 2003. Indeed, although ISBC 2003 is the first international symposium, this meeting is the sixth symposium in an already well-established series for the Forum on Biomolecular Chemistry within Japan.

We have over a hundred submissions of contributed papers, and the program committee has worked very hard to arrange an attractive program. In addition, we have excellent invited speakers from Europe, Asia and North America. We would like to express our gratitude to the organizing and program committee members for their diligent work, and the excellent arrangements could not have been made without the efforts of Proactive Convention acting as the secretariat of ISBC 2003. Finally we wish to thank the most important people of all, the invited speakers, the technical contributors and participants! We hope all participants will enjoy ISBC 2003.

Yoshinobu Baba ISBC 2003 Chairman
September 1, 2003

Overview

I. Functional DNA and RNA

The completion of the human genome sequencing project has driven our research interest and endeavor to the creation of not only pharmacogenomic/pharmacogenetic technology and gene therapeutic drugs using antisense and antigene strategies, but also functional DNA/RNA, such as DNA/RNA aptomers, Ribozyme, DNAzyme, siRNA and so on. Although we have acquired a degree of information about the primary sequence of essential exons and promoter regions of DNA, we are still just at the beginning in terms of understanding the relationship between the structure and function of DNA/RNA; for example, the driving force and rational regulations for RNA folding and tertiary-structure formation of DNA/RNA. In addition to pharmacogenomic and pharmacogenetic areas, technology is developing at a very fast pace, but is not yet feasible in large applications. The chemical synthesis and chemical modification of DNA/RNA is the fundamental technology that has led the molecular biology revolution. Hence, the chemistry of DNA, RNA and nucleic acids not only *in vitro* but also *in vivo* is expected to open a new generational stage of bioorganic chemistry and molecular biology. If we can more fully comprehend the relationship between the structure and functions of DNA and/or RNA, we should be able to design powerful tailor made functional DNA/RNA.

Therefore, the completion of human genome sequencing project is just starting-point of the Bioorganic Chemistry of nucleic acids.

(Takehiko Wada)

Overview

II. Cell Function of Macromolecules

In the research field of Biological Chemistry in post-genome project era, not only the studies to know the role of biomolecules in cells but also the techniques to utilize their function are needed. To make clear the function of macromolecules such as nucleic acids, proteins and carbohydrates in cells, it is necessary to develop the new analytical method. Recently, monitoring the dynamic phenomena of molecules in living cells was achieved by the improvement of fluorescent probes and fluorescence microscopy to investigate in their subcellular localization and their intermolecular interactions. The technology to specify the structures of bio-macromolecules has been also promptly improved in these days. Furthermore, high-throughput analyses of the sequence of nucleic acids and proteins were achieved by the development of sequencer. On the contrary, the sequence analysis of oligosaccharides as one of the metabolic products has not been established so far. However, the improvement of mass spectrometry will make it possible to analyze the structure of oligosaccharide conveniently and rapidly as well as peptides. In future, glycomics for the analysis of the expressed structures and functions will be improved as the same speed with genomics and proteomics.

Although the research of high-throughput would be available for the first screening, we should not make light of the experiments of low-throughput for the research using living cells. It is expected that investigating the function of macromolecules in cells will be an outgrowth of the extended researches. One of them would be the development of medicine. The identification of the molecules related with a disease and cell surface receptor will lead to molecular-target treatment involving protection from infection and tumor metastasis. Furthermore, for drug delivery system (DDS), although passive targeting by a physico-chemical features of DDS was the main current, active targeting by a recognition device to deliver the medicine involving nucleic acids and proteins into target cells will show the progress more and more in future. Especially for the development of gene delivery system using non-viral vector, understanding the intracellular trafficking is very important to enhance the transfection efficiency of plasmid DNA or siRNA. Peptides and oligosaccharides would be useful biomolecules to control subcellular localization of nucleic acids.

Understanding and controlling the cell function will lead to the exploration and elucidation of living system of the human body (in vivo chemistry). The research field on cell function of macromolecules is just a prologue for it.

(Toshinori Sato)

Overview

III. Metals in Chemical Biology

Over a few decades, the relationship between the role and nature of each biologically essential metal has been well defined by structural and mechanistic studies of macromolecules as well as by synthetic inorganic chemistry. However, despite recent rapid development in spectroscopic and crystallographic techniques, it is easy even for modern science neither to describe nor to recreate the metal-independent chemical behaviors accurately at the molecular level. In this session, extensive structural and mechanistic works on the natural systems themselves as well as excellent synthetic models, that best mimic and elucidate the stoichiometric and functional properties of the metalloenzyme active sites including multi-metallic centers, will be presented. As more details about biologically essential metals and more excellent synthetic bioinorganic molecules become available, more chemists, biologists, and physicists will become interested in this diverse and fascinating chemical area. We hope that many participants will be aware of new projects that have been recently launched, and that this session will be catalytic for all the participants, whetting their appetites for new directions in the widespread bioinorganic chemistry.

(Mitsuhiko Shionoya)

Overview

IV. Protein-Protein Interaction

With the human genome sequenced, attention is turning to the final product of that genome: proteins. The large number of cellular processes involve specific protein-protein or protein-nucleic acid interactions, including signal transduction, transcription, cellular trafficking, and mitosis. Understanding these interactions has mostly depended on the tools of genetics so far. In genetic approaches, a gene is deleted or altered and then the effect on the interactions is observed. However, there can be problems with traditional genetics. For example, most genetic mutations are not conditional; they can not be turned on or off at will. Now, geneticists are realizing that chemists can make an important contribution by designing specific molecules that can selectively disable particular protein-protein or interactions. Chemists are developing a rich variety of chemical approaches that enable us to understand and manipulate protein-protein interactions, chemical genetics, combinatorial chemistry, directed evolution, and so on. The analysis of such protein-protein interactions, whether qualitative or quantitative, presents a tremendous challenge for chemists. This hot topic is the subject of this session.

(Ikuo Fujii)

Overview

V. Technology Innovation in Biomolecular Chemistry

Completion of the deciphering of the human genome was declared on April 14, 2003, after 10 years of endeavor by an international collaboration of scientists. This feat relied heavily on innovations made in the biotechnology area, particularly DNA sequencing. Biomolecular chemistry, which deals with the clarification of various phenomena associated with life at the molecular level, has contributed tremendously to this innovation by providing numerous novel technologies that have helped analyze the phenomena of life. In relation to this, biomolecular chemistry has also generated new artificial systems bearing un-natural functions under certain conditions. Furthermore, it is strongly anticipated that technologies derived from biomolecular studies will provide powerful new analytical tools in biological, medical and related areas. They include DNA and RNA aptomers, combinatorial chemistry and the specific incorporation of artificial amino acids into proteins, along with new technologies connected with microfluidics, DNA- and protein-chips. These technologies developed thus far not only provided simple tools for research in this area, but have also produced materials of commercial value which contribute to human welfare.

In the 21st century, the areas connected with biomolecular chemistry will continue contributing to industry more than ever. These technologies have been developed mostly at universities and companies, however, it seems to be important that the connection between universities and companies is strong enough without compromising scientific independence for this new area of science.

Herein, papers connected with the new sciences and technologies of biomolecular chemistry are collected. They include research not only to meet the current social demands but also to create new science fields and business markets.

(Shigeori Takenaka)

PROGRAM

INVITED LECTURES

Wednesday, December 3 (Main Hall)

Session I. Functional DNA/RNA

9:00-12:00 (Chairpersons: Peter E. Nielsen and Naoki Sugimoto)		Proceedings	Abstract
OI-1	Regulation of Gene Expression by Peptide Nucleic Acid Antisense. Targeting the <i>mdm2</i> Oncogene Takehiko Shiraishi, and Peter E. Nielsen <i>Department of Medical Biochemistry and Genetics, The Panum Institute, University of Copenhagen, Blegdamsvej 3, DK2200, Denmark</i>	4	24
OI-2	Ribozymes for New Genetic Coding Systems Hiroaki Suga ^{†‡} , Hiroshi Murakami [†] , and Dimitrios Kourouklis [‡] [†] Research Center for Advanced Science and Technology, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8904, Japan, [‡] Department of Chemistry, University at Buffalo, The State University of New York, Buffalo, NY 14260-3000, USA	8	24
Coffee Break (10:20-10:40)			
OI-3	Modified Nucleic Acid Systems: Design, Synthesis and Evaluation Byeang Hyeon Kim <i>National Research Laboratory, Department of Chemistry, Division of Molecular and Life Sciences, Pohang University of Science and Technology, Pohang 790-784, Korea</i>	12	24
OI-4	How Proteins are Transported into and out of the Nucleus Yoichi Miyamoto, and Yoshihiro Yoneda <i>Department of Frontier Biosciences, Graduate School of Frontier Biosciences, Osaka University, 2-2 Yamada-oka, Suita, Osaka 565-0871, Japan</i>	16	24

Session II. Cell Function of Macromolecules

15:00-18:00 (Chairpersons: Kay-Hooi Khoo and Koichi Fukase)		Proceedings	Abstract
OII-1	Carbohydrate Recognition Systems in Cell-Cell Interactions and Signaling Reiji Kannagi <i>Department of Molecular Pathology, Aichi Cancer Center, Nagoya 464-8681, Japan</i>	88	24
OII-2	Automated Solid-Phase Oligosaccharide Synthesis Peter H. Seeberger <i>Laboratory of Organic Chemistry, ETH-Hönggerberg, Zürich, 8093, Switzerland and The Burnham Institute, La Jolla, CA 92037, USA</i>	92	24
Coffee Break (16:20-16:40)			
(Chairpersons: Peter H. Seeberger and Toshinori Sato)			
OII-3	Sialic Acid Synthase from <i>Escherichia coli</i>- Structural Characterization by Mass Spectrometry Yu-Ju Chen [†] , Tzann-Shun Hwang ^{†§} , Xing-Hung Hwang [†] , Hsin-Kai Liao [†] , and Chun-Hung Lin ^{†§} [†] Institutes of Chemistry, Academia Sinica, Taipei, Taiwan, [‡] Institute of Biochemical Sciences, National Taiwan University, Taipei, Taiwan, [§] Institutes of Biological Chemistry, Academia Sinica, No.128 Academia Road Section 2, Nan-Kang, Taipei, 11529, Taiwan	96	24
OII-4	Mass Spectrometry Profiling and Sequencing of Complex Glycans in Glycomics and Glycoproteomics Kay-Hooi Khoo <i>Institute of Biological Chemistry and Core Facilities for Proteomics Research, Academia Sinica, Nankang, Taipei 11529, Taiwan</i>	98	24

Thursday, December 4

Session III. Metals in Chemical Biology

9:00-12:00 (Chairpersons: David P. Giedroc and Mitsuhiro Shionoya) Proceedings Abstract
 OIII-1 **Structure and Function of the Heme-Based Sensor Proteins** 142 24

Shigetoshi Aono*Center for Integrative Bioscience, Okazaki National Research Institutes, 38 Nishigo-naka, Myodaiji, Okazaki, Aichi 444-8585, Japan*

OIII-2 **Helix-Inducing Metal Clips in Short Peptides** 146 24

Renee L. Beyer[†], Michael J. Kelso[†], Huy Hoang^{†‡}, Trevor Appleton[‡], and David P. Fairlie[†][†]*Centre for Drug Design and Development, Institute for Molecular Bioscience, ‡Department of Chemistry, University of Queensland, Brisbane, Qld 4072, Australia*

OIII-3 **Oxygenation Mechanism of Phenols by Dinuclear Copper Monooxygenase** 150 24

Shinobu Itoh[†], Shin-ichi Yamazaki[†], Hideyuki Kumei[‡], Masayasu Taki[†], Takao Osako[†], and Shunichi Fukuzumi[‡][†]*Department of Chemistry, Graduate School of Science, Osaka City University, 3-3-138 Sugimoto, Sumiyoshi-ku, Osaka 558-8585, Japan, ‡Department of Material and Life Science, Graduate School of Engineering, Osaka University, CREST, Japan Science and Technology Corporation, 2-1 Yamada-oka, Suita, Osaka 565-0871, Japan*

Coffee Break (10:30-10:50)

(Chairpersons: David P. Fairlie and Kazuya Kikuchi)

OIII-4 **Molecular Interaction and Protein Folding of Plastocyanin** 156 24

Shun Hirota*Department of Physical Chemistry, Kyoto Pharmaceutical University, Misasagi, Yamashina, Kyoto 607-8414, Japan*

OIII-5 **Coordination Chemistry and Allosteric Switching in Bacterial Metal Sensor Proteins** 160 24

Mario A. Pennella[†], Christoph Eicken[‡], Laura S. Busenlehner[†], Xiaohua Chen[†], Michael L. VanZile[†], James C. Sacchettini[‡], and David P. Giedroc[†][†]*Department of Biochemistry and Biophysics, Centers for Advanced Biomolecular Research, ‡Structural Biology, 2128 TAMU, Texas A&M University, College Station, TX 77843-2128 USA***Session IV. Protein-Protein Interaction**

15:00-18:00 (Chairperson: Don Hilvert) Proceedings Abstract

OIV-1 **Developing Chemical Biology Tools for the Study of Functional Proteomics** 214 24

Lai-Peng Tan[†], Resmi C. Panicker[‡], Lay-Pheng Tan[†], Souvik Chattopadhyaya[†], and Shao Q. Yao^{†‡}[†]*Department of Biological Sciences, ‡Department of Chemistry, National University of Singapore, 3 Science Drive 3, Singapore 117543*

OIV-2 **New Chemical Genetic Analysis of Cellular Signal Transduction** — 24

Kevan M. Shokat*Department of Cellular and Molecular Pharmacology, UCSF; Department of Chemistry, UC Berkeley*

Coffee Break (16:20-16:40)

(Chairpersons: Kohei Tsumoto and Takeshi Tsumuraya)

OIV-3 **Endogenous Gene Regulation with Polydactyl Zinc Finger Transcription Factors** — 24

Carlos F. Barbas, III*The Skaggs Institute for Chemical Biology and the Department of Molecular Biology, The Scripps Research Institute, La Jolla, CA, USA, 92037.*

OIV-4 **Searching Sequence Space for Protein Catalysts** — 24

Donald Hilvert*Laboratorium für Organische Chemie, Swiss Federal Institute of Technology, ETH-Hönggerberg, CH-8093 Zurich, Switzerland*

Friday, December 5

Session V. Technology Innovation in Biomolecular Chemistry

9:00-13:00 (Chairperson: Shigeori Takenaka)

Proceedings Abstract

OV-1 **The Chemical Biology of Protein Splicing** — 24

Tom W. Muir

The Rockefeller University, USA

OV-2 **Tagged Small Molecule Library Approach to Facilitated Chemical Genetics** 302 24

Sonya M. Khersonsky, Da-Woon Jung, Jae Wook Lee, Daniel P. Walsh, and Young-Tae Chang

Department of Chemistry, New York University, New York, NY 10003, USA

OV-3 **Novel Fabrication Method for Protein Chip: Electrospray Deposition of Protein onto MALDI-TOF-MS Sample Plate** — 24

Hisashi Arikuni

Kyoto Prefectural University of Medicine, Kamigyo-ku, Kyoto 602-8566, Japan, Yokohama Laboratory, Biomarker Science Co.,Ltd, Leading Venture Plaza 409, 75-1 Ono-cho, Tsurumi-ku, Yokohama, 230-0046, Japan

Coffee Break (10:40-10:50)

(Chairperson: Young-Tae Chang)

OV-4 **Surface and Micro Bead Chemistry for Successful Peptide Array Synthesis and Protein Identification** 308 24

Dong-Sik Shin[†], Woo-Jae Chung[†], Do-Hyun Kim[†], Kook-Nyung Lee[‡], Min-Su Kim[‡], Suhyung Cho[§], Yong-Kweon Kim[‡], Byung-Gee Kim^{† §}, and Yoon-Sik Lee[†]

[†]School of Chemical Engineering, Seoul National University, Seoul 151-744, Korea, [‡]School of Electrical Engineering & Computer Science, Seoul National University, Seoul 151-744, Korea, [§]Interdisciplinary Program for Biochemical Engineering and Biotechnology, Seoul National University, Seoul 151-744, Korea

OV-5 **From the DNA Sensor to the Future DNA Chip** 312 24

Shigeori Takenaka

Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka-City, Fukuoka 812-8581, Japan

OV-6 **Nano-Biodevice in the Post-Genome Sequencing Era** 316 24

Yoshinobu Baba^{†‡}

[†]Department of Medicinal Chemistry, The University of Tokushima, CREST, JST, Tokushima, Japan,

[‡]Single-Molecule Bioanalysis Laboratory, National Institute of Advanced Industrial Science and Technology(AIST), Takamatsu, Japan

POSTER PROGRAM

Wednesday, December 3 (odd-numbered), Thursday, December 4 (even-numbered)

Session I. Functional DNA/RNA

13:00-15:00 Reception Hall (B)		Proceedings
PI-01	<i>In Vitro</i> Selection of RNA Aptamers That Inhibit the Amyloid-Fibril Formation of Ab <u>Kosuke Tada</u> , Tsuyoshi Takahashi, and Hisakazu Mihara <i>Department of Bioengineering, Graduate School of Bioscience and Biotechnology, Tokyo Institute of Technology, Yokohama 226-8501, Japan</i>	20
PI-02	<i>In Vitro</i> Selection of Four Way Junction DNA on a QCM <u>Tomomitsu Ozeki</u> , Hiroyuki Furusawa, and Yoshio Okahata <i>Department of Biomolecular Engineering, Tokyo Institute of Technology, Yokohama, Kanagawa 226-8501, Japan, and CREST, Japan Science and Technology Corporation</i>	22
PI-03	<i>In Vitro</i> Selection of Saccharide-Modified DNA That Bind to Lectin Masayuki Matsui, <u>Akiko Onizawa</u> , and Yasuhito Ebara <i>Graduate School of Cultural Studies and Human Science, Kobe University, Kobe, Hyogo 657-8501, Japan</i>	24
PI-04	Induction and Inhibition of <i>P. aeruginosa</i> Quorum Sensing by Synthetic Autoinducer Analogs <u>Hiroaki Suga</u> ^{§†} , Kristina Smith [§] , and Yigong Bu [§] [§] <i>Departments of Chemistry and Biological Sciences, University at Buffalo, The State University of New York, Buffalo, NY 14260-3000, USA, †Research Center for Advanced Science and Technology, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8904, Japan</i>	26
PI-05	A Ribozyme Displaying Alcohol Dehydrogenase Activity <u>Hiroaki Suga</u> ^{†‡} , Shinya Tsukiji [§] , Swetansu B. Pattnaik [†] [†] <i>Research Center for Advanced Science and Technology, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8904, Japan, ‡Department of Chemistry, University at Buffalo, The State University of New York, Buffalo, NY 14260-3000, USA, §Department of Chemistry and Biotechnology, School of Engineering, University of Tokyo, 7-3-1 Hongo, Tokyo 113-8656, Japan</i>	28
PI-06	A Versatile Ribozyme for tRNA Aminoacylation <u>Hiroshi Murakami</u> ^{†‡} , Hirohide Saito ^{†§} , and Hiroaki Suga ^{†‡} [†] <i>Department of Chemistry, University at Buffalo, State University of New York, Buffalo, NY 14260-3000, USA, Current address: ‡Research Center for Advanced Science and Technology, University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo, 153-8904, Japan, §Cancer Institute, Japanese Foundation for Cancer Research, 1-37-1 Kami-ikebukuro, Toshima-ku, Tokyo, 170-8455, Japan</i>	30
PI-07	Engineering of tRNA for Incorporation of Nonnatural Amino Acids into Proteins <u>Hikaru Taira</u> [†] , Masaharu Fukushima [†] , Takahiro Hohsaka [§] , and Masahiko Sisido [†] [†] <i>Department of Bioscience and Biotechnology, Faculty of Engineering, Okayama University, 3-1-1 Tushima-naka, Okayama 700-8530, Japan, §School of Materials Science, Japan Advanced Institute of Science and Technology, 1-1 Asahidai, Tatunokuchi, Isikawa 923-1292, Japan</i>	32
PI-08	A Nano-Circular Single-Stranded DNA Works as a Novel Tool for Cell-Free Peptide Synthesis and Detection of SNPs <u>Tatsuo Ohmichi</u> ^{†§} , Aki Takashima [†] , and Naoki Sugimoto ^{†‡} [†] <i>High Technology Research Center, and ‡Department of Chemistry, Faculty of Science and Engineering, Konan University, 8-9-1 Okamoto, Higashinada-ku, Kobe 658-8501, Japan, §I.S.T Corporation, 13-13-5 Ichiriyama, Otsu, Shiga 520-2153, Japan</i>	34
PI-09	Nonenzymatic Organic Synthesis on a Single Strand DNA by Artificial tRNA <u>Kunihiro Kaihatsu</u> , Shin-ichi Ueji, and Yasuhito Ebara <i>Graduate School of Cultural Studies and Human Science, Kobe University, Kobe, Hyogo 657-8501, Japan</i>	36
PI-10	A Thermal RNA Functional Switch <u>Kazuo Harada</u> , Xianglan Li, and Koh Kobayashi <i>Department of Life Science, Tokyo Gakugei University, Koganei, Tokyo 184-8501, Japan</i>	38

- PI-11** **Supramolecular Complex Formation with β -Cyclodextrin and Adamantyl Naphthalene Diimide Bound to Double Stranded DNA by Threading Intercalation** **40**
Shinobu Sato[†], Takahiko Nojima[†], Hiroki Kondo[‡], and Shigeori Takenaka[†]
[†]*Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka 812-8581, Japan,* [‡]*Department of Biochemical Engineering and Science, Faculty of Computer Science and Systems Engineering, Kyushu Institute of Technology, Kawazu 680-4, Iizuka, Fukuoka 820-8502, Japan*
- PI-12** **Peptide Ribonucleic Acids (PRNAs): Novel Strategy for Active Control of DNA Recognition by External Factors** **42**
Takehiko Wada[†], Hirofumi Sato[†], Yusuke Hashimoto[†], and Yoshihisa Inoue^{†§}
[†]*Department of Molecular Chemistry, Graduate School Engineering, Osaka University, Suita, Osaka 565-0871, Japan,* [‡]*CREST, Japan Sciences and Technology Corporation (JST), Shomachi, Tokushima 770-8505, Japan,* [§]*Department of Medicinal Chemistry, Faculty of Pharmaceutical Sciences, The University of Tokushima, Shomachi, Tokushima 770-8505, Japan*
- PI-13** **Conformation and Recognition Control of alpha-Peptide Ribonucleic Acid by External Factors** **46**
Mayuko Kikkawa[†], Hirofumi Sato[†], Takehiko Wada[†], and Yoshihisa Inoue^{†‡}
[†]*Department of Molecular Chemistry, Graduate School of Engineering, Osaka University, Yamada-oka, Suita 565-0871, Japan,* [‡]*ICORP Entropy Control Project, JST, 4-6-3 Kamishinden, Toyonaka 565-0085, Japan*
- PI-14** **Conformation and Recognition Control of Peptide Ribonucleic Acid Derivatives by External and Internal Factors** **48**
Tetsuya Hirose[†], Hirofumi Sato[†], Takehiko Wada[†], and Yoshihisa Inoue^{†‡}
[†]*Department of Molecular Chemistry, Graduate School of Engineering, Osaka University, Yamada-oka, Suita 565-0871, Japan,* [‡]*ICORP Entropy Control Project, JST, 4-6-3 Kamishinden, Toyonaka 565-0085, Japan*
- PI-15** **Synthesis and Characterization of Viologen-Tethered Peptide Nucleic Acid (VPNA) or Diazapyrene-Tethered PNA (DPNA)** **50**
Atsushi Hida, Hisafumi Ikeda, and Yusin Nakamura
Department of Biological Science and Technology, Faculty of Industrial Science and Technology, Tokyo University of Science, 2641 Yamazaki, Noda, Chiba 278-8510, Japan
- PI-16** **Bis-Pyrene Modified Oligonucleotides Provide a Useful Probe for the Detection of Single Base Mismatches Based on Polycation Stimulated DNA Strand Exchange Reaction** **52**
Kazushige Yamana^{†‡}, Yudai Fukunaga[†], Yusuke Ohtani[†], Hidehiko Nakano[†], Won Jong Kim[¶], Toshihiro Akaike[¶], and Atsushi Maruyama^{¶§}
[†]*Department of Applied Chemistry, Himeji Institute of Technology, 2167 Shosha, Himeji 671-2201, Japan,* [‡]*SOST of JST,* [¶]*Department of Biomolecular Engineering, Tokyo Institute of Technology, Midori, Yokohama 226-8501, Japan,* and [§]*PRESTO of JST*
- PI-17** **Relationship between Structure of Cationic Groups of Dendritic Poly(L-lysine) and Gene Transfection Ability into Cells** **54**
Takuro Niidome[†], Tatsuya Okuda[‡], and Haruhiko Aoyagi[†]
[†]*Department of Materials Science, Graduate School of Science and Technology, Nagasaki University, Nagasaki 852-8521, Japan,* [‡]*Department of Marine Science and Technology, Graduate School of Science and Technology, Nagasaki University, Nagasaki 852-8521, Japan*
- PI-18** **Rapid and Simple DNA Mismatch Detection Using Artificial Nucleic Acid Chaperones** **56**
Atsushi Maruyama^{†‡}, Won Jong Kim[‡], Yuichi Sato[†], and Toshihiro Akaike[‡]
[†]*Presto, JST,* [‡]*Department of Biomolecular Engineering, Tokyo Institute of Technology, 4259 Nagatsuta-cho, Midori, Yokoihama 226-8501, Japan*
- PI-19** **Synthesis of Bis-Naphthalene Diimide and Its Interaction with Double Stranded DNA** **58**
Toyofumi Nagamatsu, Keiichi Ohtsuka, Takahiko Nojima, and Shigeori Takenaka
Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka-City, Fukuoka, 812-8581, Japan
- PI-20** **Electrochemical Study of Ferrocenylnaphthalene Diimide on the DNA-Immobilized Gold Electrode** **60**

Masaharu Komatsu[†], Shinobu Sato[†], Takahiko Nojima[†], Hiroki Kondo[‡], and Shigeori Takenaka[†]

[†]*Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka 812-8581, Japan,* [‡]*Department of Biochemical Engineering and Science, Faculty of Computer Science and Systems Engineering, Kyushu Institute of Technology, Kawazu 680-4, Iizuka, Fukuoka 820-8502, Japan*

- PI-21 Synthesis of Poly-Acridine Orange Peptides Aiming at a Fluorescent Reagent with High Preference for Double Stranded DNA** **62**
Yutaka Sakakibara, Hiroyuki Ueyama, Keiji Mizuki, Satoshi Fujii, Takahiko Nojima, and Shigeori Takenaka
Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka-City, Fukuoka 812-8581, Japan
- PI-22 Interaction between Conformationally-Restricted Oxy-Peptide Nucleic Acids/DNA Hybrids and a Cyanine Dye** **64**
Mizuki Kitamatsu, Naoki Ototake, Takashi Nakai, Mamoru Saito, Sayaka Nakamura, Tomoyuki Okada, and Masahiko Sisido
Department of Bioscience and Biotechnology, Faculty of Engineering, Okayama University, Tsushimanaka 3-1-1, Okayama 700-8530, Japan
- PI-23 Molecular Design, Chemical Synthesis and Evaluation of Cyclic Trimers of Thiazoles as Novel Human Telomerase Inhibitors** **66**
Ryoko Imagawa, Shuichi Matsumura, and Kazunobu Toshima
Department of Applied Chemistry, Faculty of Science and Technology, Keio University, 3-14-1 Hiyoshi, Kohoku-ku, Yokohama 223-8522, Japan
- PI-24 Self-Organized Nanostructures in Individual Giant DNA Molecules Controlled with Polyamine Surfactants and Nanogels** **68**
Naomi Miyazawa[†], Takahiro Sakaue[‡], Kenichi Yoshikawa[‡], and Kazunari Akiyoshi[†]
[†]*Institute of Biomaterials and Bioengineering Tokyo Medical and Dental University, 2-3-10 Kanda-Surugadai Chiyoda-ku Tokyo 101-0062, Japan,* [‡]*Department of Physics, Graduate School of Science, Kyoto University, Kyoto 606-8502, Japan*
- PI-25 Chiral Differentiation in DNA Compaction Induced by Tripeptides** **70**
Michiko Ito[†], Shizuaki Murata[‡], and Kenichi Yoshikawa[§]
[†]*CREST of Japan Science and Technology Corporation (JST), Chikusa, Nagoya, 464-8601, Japan,* [‡]*Graduate School of Environmental Studies, c/o School of Informatics and Sciences, Nagoya University, Chikusa, Nagoya, 464-8601, Japan,* [§]*Department of Physics, Graduate School of Science, Kyoto University, Kyoto, 606-8504, Japan*
- PI-26 Application of Novel Functionalized Peptide Nucleic Acid Probes Having Cell-Membrane Permeability** **72**
Madoka Tonosaki, Hisafumi Ikeda, Akinori Sugiyama, Fumio Tashiro, and Yushin Nakamura
Department of Biological Science and Technology, Faculty of Industrial Science and Technology, Tokyo University of Science, Noda, Chiba 278-8510, Japan
- PI-27 An Intracellular Signal-Responsive Artificial Gene Carrier for Novel Cell-Specific Gene Expression** **76**
Kenji Kawamura, Tatsuhiko Sonoda, Jun Ohishi, Masaharu Murata, and Yoshiki Katayama
Department of Applied Chemistry, Graduate School of Engineering, Kyushu University, 6-10-1 Hakozaki, Higashi-ku, Fukuoka 812-8581, Japan
- PI-28 Biodegradable Gene Carrier Based on b-(1,3)-D-Glucan: Schizophyllan** **78**
Takeshi Nagasaki[†], Masaya Hojo[†], Atsushi Uno[†], Kazuya Koumoto[‡], Masami Mizu[‡], Kazuo Sakurai[‡], and Seiji Shinkai[§]
[†]*Department of Applied & Bioapplied Chemistry, Graduate School of Engineering, Osaka City University, Sugimoto, Sumiyoshi, Osaka 558-8585, Japan,* [‡]*Department of Chemical Process & Environments, The University of Kitakyushu, Hibikino, Kitakyushu, Fukuoka 808-0135, Japan,* [§]*Department of Chemistry & Biochemistry, Graduate School of Engineering, Kyushu University, Hakozaki, Fukuoka 812-8581, Japan*
- PI-29 Effect of the Substituents of Naphthalene Diimide on Its Threading Intercalation into the DNA Duplex** **82**
Satoshi Kumamoto, Shinobu Sato, Takahiko Nojima, and Shigeori Takenaka

Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka-City, Fukuoka 812-8581, Japan

Session II. Cell Function of Macromolecules

13:00-15:00 Reception Hall (B)		Proceedings
PII-01	A Sugar Cylinder – Molecular Design and Functions <u>Keigo Aoi</u> ^{†‡} , Midori Okazaki [†] , and Masahiko Okada [§] [†] Graduate School of Bioagricultural Sciences, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8601, Japan, [‡] PRESTO, JST, [§] College of Bioscience and Biotechnology, Chubu University, 1200 Matsumoto-cho, Kasugai, Aichi 487-8501, Japan	102
PII-02	Synthesis of Peptidoglycan Partial Structures for Elucidation of the Mechanism of Its Immunostimulation <u>Yukari Fujimoto</u> , Seiichi Inamura, Akiko Kawasaki, Osamu Kubo, Koichi Fukase, and Shoichi Kusumoto Department of Chemistry, Graduate School of Science, Osaka University Toyonaka, Osaka 560-0043, Japan	104
PII-03	Lectin-Induced Agglutination of Liposomes Composed of Synthetic Glycolipid Analogues Possessing an Oligomethylene Spacer <u>Yasuo Azefu</u> [†] , Hitoshi Tamiaki [†] , Reiko Sato [‡] , and Kazunori Toma [‡] [†] Department of Bioscience and Biotechnology, Faculty of Science and Engineering, Ritsumeikan University, Kusatsu, Shiga 525-8577, Japan, [‡] The Noguchi Institute, Itabashi, Tokyo 173-0003, Japan	106
PII-04	Glycosylamidines as Potent and Selective Glycosidase Inhibitors <u>Masahiro Kato</u> [†] , Jun Hiratake [†] , Masayasu Takada [‡] , Koichi Ogawa [‡] , and Kanzo Sakata [†] [†] Institute for Chemical Research, Kyoto University, Uji, Kyoto 611-0011, Japan, [‡] Research Institute, Nihon Shokuhin Kako Co., Ltd., 30 Tajima, Fuji, Shizuoka 417-8530, Japan	108
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[†]Department of Chemistry and Biochemistry, Graduate School of Engineering, Kyushu University, Fukuoka 812-8581, Japan, [‡]PRESTO (Organization and Function), JST, [§]Institute for Materials Chemistry and Engineering (IMCE)
- PIV-32 Photo-Responsive Property of Semi-Synthetic RNase A by Peptide Backbone Engineering** **290**
Noriyuki Kasagi[†], Takashi Hiraoka[†], and Itaru Hamachi^{†‡}
[†]Department of Chemistry and Biochemistry, Graduate School of Engineering, Kyushu University, Fukuoka 812-8581, Japan, [‡]Institute for Materials Chemistry and Engineering (IMCE)
- PIV-33 Synthesis and Characterization of Mutants of Streptavidin in Which a Nonnatural Amino Acid Carrying Ferrocenyl Group Was Incorporated at a Specific Site** **292**
Akira Fujii[†], Hiroaki Shinohara[†], Takahiro Hohsaka[§], and Masahiko Sisido[†]
[†]Department of Bioscience and Biotechnology, Faculty of Engineering, Okayama University, Tsushima-naka, Okayama 700-8530, Japan, [‡]Department of System Engineering of Material and Life Science, Faculty of Engineering, Toyama University, Gofuku, Toyama 930-8555, Japan, [§]School of Materials Science and Technology, Japan Advanced Institute of Science and Technology, Tatsunokuchi, Ishikawa 923-1292, Japan
- PIV-34 In Vitro Engineering of GFP Mutants Containing Nonnatural Amino Acids at Tyr66 Position** **294**
Daisuke Kajihara^{†‡}, Takahiro Hohsaka[†], and Masahiko Sisido[†]
[†]Department of Bioscience and Biotechnology, Faculty of Engineering, Okayama University, 3-1-1 Tsushimanaka, Okayama 700-8530, Japan, [‡]School of Materials Science, Japan Advanced Institute of Science and Technology, 1-1 Asahidai, Tatsunokuchi, Ishikawa 923-1292, Japan
- PIV-35 Photoswitching of Protein Activity by Position-Specific Incorporation of a Photoisomerizable Nonnatural Amino Acid into Proteins** **296**
Norihito Muranaka^{†‡}, Takahiro Hohsaka[†], Taishi Manabe[†], Kaiyo Maeda[†], and Masahiko Sisido[†]
[†]Department of Bioscience and Biotechnology, Faculty of Engineering, Okayama University, 3-1-1 Tsushimanaka, Okayama 700-8530, Japan, [‡]School of Materials Science, Japan Advanced Institute of Science and Technology, 1-1 Asahidai, Tatsunokuchi, Ishikawa 923-1292, Japan

Session V. Technology Innovation in Biomolecular Chemistry

13:00-15:00 Hallway from the Conference center to the Hotel

Proceedings

PV-01 The SPR Sensor Detecting Mismatch DNAs

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Kazuhiko Nakatani^{†‡}, Akio Kobori[†], Shinya Hagihara[†], Hitoshi Suda[†], Yuki Goto[†], and Isao Saito[†]

[†]Department of Synthetic Chemistry, Graduate School Engineering, Kyoto University, Kyoto, Kyoto

615-8510, Japan, [‡]PRESTO, Japan Science and Technology Corporation

- PV-02 Novel Immobilization Technique of Single-Stranded DNA Molecules on a Glass Surface for Direct Analysis of DNA Polymerase Activity** **322**
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[†]Department of Biological Science & Technology, Tokyo University of Science, Yamazaki, Noda, Chiba 278-8510, Japan, [‡]Department of Ecological Engineering, Toyohashi University of Technology, Tempaku-cho, Toyohashi, Aichi 441-8580, Japan, [§]Department of Applied Biological Science, Tokyo University of Science, Yamazaki, Noda, Chiba 278-8510, Japan, [¶]Department of Nutritional Science, Kobe-Gakuin University, Ikawadani-cho, Nishi-ku, Kobe, Hyogo 651-2180, Japan
- PV-03 Simple Biosensing for a Target Oligonucleotide by Fluorescence Measurement Using Evanescent Wave** **326**
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[†]Department of System Engineering of Materials and Life Science, Faculty of Engineering, Toyama University, Gofuku, Toyama 930-8555, Japan, [‡]Department of Bioscience and Biotechnology, Faculty of Engineering, Tsushima-naka, Okayama 700-8530, Japan
- PV-04 Development of a New Class of Molecular Beacons Utilizing a Switching between Pyrene Monomer and Excimer Emissions: Highly Sensitive DNA Probes** **328**
Kazuhisa Fujimoto[‡], Hisao Shimizu[‡], and Masahiko Inouye^{†‡}
[†]PRESTO, Japan Science and Technology Corporation (JST), [‡]Faculty of Pharmaceutical Sciences, Toyama Medical and Pharmaceutical University, Sugitani Toyama 930-0194, Japan
- PV-05 Toward the Construction of Universal Small-Molecule Microarrays: Functional Group Independently-Immobilized Arrays of Small Molecules** **330**
Naoki Kanoh[†], Saori Kumashiro[†], Siro Simizu[†], Yasumitsu Kondoh[‡], Satoru Hatakeyama[‡], Hideo Tashiro[‡], and Hiroyuki Osada[†]
[†]Antibiotics Laboratory, Discovery Research Institute, RIKEN, 2-1 Hirosawa, Wako-shi, Saitama 351-0198, Japan. [‡]Advanced Engineering Center, RIKEN, 2-1 Hirosawa, Wako-shi, Saitama 351-0198, Japan.
- PV-06 Energy Transfer Behavior in Chromophore Array Constructed by DNA Assembly in the Presence of Polycationic Graft Copolymer** **332**
Yuichi Ohya[†], Naoto Ohe[†], Tatsuto Ouchi[†], Won Jon Kim[‡], Toshihiro Akaike[‡], and Atsushi Maruyama^{‡§}
[†]Department of Applied Chemistry, Faculty of Engineering & High Technology Research Center, Kansai University, Suita, Osaka 564-8680, Japan, [‡]Department of Biomolecular Engineering, Tokyo Institute of Technology, 4259 Nagatsuda, Midoriku, Yokohama 226-8501, Japan, [§]Precursory Research for Embryonic Science and Technology, Japan Science and Technology Corporation
- PV-07 Synthesis of an Anthracene Derivative Carrying Fluorescein and Evaluation of Its Specific Binding to Double Stranded DNA** **334**
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 Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka-City, Fukuoka 812-8581, Japan
- PV-08 Novel Ferrocenylation Reagent of DNA for Electrochemical Gene Detection** **336**
Kosuke Mukumoto, Takahiko Nojima, and Shigeori Takenaka
 Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka-City, Fukuoka 812-8581, Japan
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Keiji Mizuki, Takahiko Nojima, and Shigeori Takenaka
 Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka-City, Fukuoka 812-8581, Japan
- PV-10 Design of Molecular Beacon Peptide Nucleic Acid (PNA) Arrays** **340**
Fumihiko Kitagawa, Hisafumi Ikeda, and Yushin Nakamura
 Department of Biological Science and Technology, Faculty of Industrial Science and Technology, Tokyo University of Science, 2641 Yamazaki, Noda, Chiba 278-8510, Japan

- PV-11 Construction of Protein-Detection Microarrays Using Structure-Based Peptide Libraries** 344
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[†]*Department of Bioengineering, Tokyo Institute of Technology, Yokohama 226-8501, Japan,* [‡]*HiPep Laboratories, Kyoto 602-8158, Japan*
- PV-12 Efficient Immobilization of Peptides Carrying a Disulfide Bond on a Solid Substrate** 346
Ryo Kajiki, Keiichi Ohtsuka, Michinori Waki, Takahiko Nojima, and Shigeori Takenaka
Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka-City, Fukuoka, 812-8581, Japan
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Keiichi Ohtsuka, Takahiko Nojima, and Shigeori Takenaka
Department of Applied Chemistry, School of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-ku, Fukuoka-City, Fukuoka, 812-8581, Japan
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[†]*Department of Applied Chemistry and Biochemistry, Faculty of Engineering, Kumamoto University, 2-39-1 Kurokami, Kumamoto 860-8555, Japan,* [‡]*Kumamoto Health Science University, 325 Izumimachi, Kumamoto 861-5598, Japan*
- PV-15 Single Nucleotide Mutation Assay Based on Salting-Out Techniques Using DNA-Linked Colloidal Nanoparticles** 352
Zhonglan Tang^{†‡}, Yoshikuni Sato[†], Tohru Takarada[‡] and Mizuo Maeda^{†‡}
[†]*Department of Applied Chemistry, Graduate School of Engineering, Kyushu University, 6-10-1 Hakozaki, Higashi-ku, Fukuoka 812-8581, Japan,* [‡]*Bioengineering Laboratory, The Institute of Physical and Chemical Research (RIKEN), 2-1 Hirosawa, Wako, Saitama 351-0198, Japan*
- PV-16 Single DNA Molecule Processing on a Chip for Genome Analysis** 354
Ken Hirano[†], and Yoshinobu Baba^{†§}
[†]*Department of Medicinal Chemistry, Faculty of Pharmaceutical Sciences, The University of Tokushima, and CREST of Japan Science and Technology Corporation (JST), Tokushima, Tokushima 770-8505, Japan,* [§]*Single-Molecule Bioanalysis Laboratory, National Institute of Advanced Industrial Science and Technology (AIST), Takamatsu, Kagawa 761-0395, Japan*
- PV-17 Fast DNA Separation by Nanopillar Chip** 358
Noritada Kaji[†], Yojiro Tezuka[‡], Yuzuru Takamura[‡], Masanori Ueda[†], Takahiro Nishimoto[§], Hiroaki Nakanishi[§], Yasuhiro Horiike[‡], and Yoshinobu Baba^{†¶}
[†]*Department of Medicinal Chemistry, Faculty of Pharmaceutical Sciences, The University of Tokushima, CREST, Japan Science and Technology Corporation (JST), Tokushima 770-8505, Japan,* [‡]*Department of Material Engineering, The University of Tokyo, Tokyo 113-8656, Japan,* [§]*Technology Research Laboratory, Shimadzu Corporation, Kyoto 619-0237, Japan,* [¶]*Single-Molecule Bioanalysis Laboratory, National Institute of Advanced Industrial Science and Technology (AIST), Takamatsu 761-0395, Japan*
- PV-18 Microchip Separation of Specific DNA Fragments Using Mixed Polyethylene Oxide Solutions** 360
Feng Xu^{†‡}, Mohammad Jabasini[†], and Yoshinobu Baba^{†§}
[†]*Department of Medicinal Chemistry, Faculty of Pharmaceutical Sciences, The University of Tokushima, CREST, JST, Japan,* [‡]*Analytical Instruments Division, Shimadzu Corp., Kyoto, Japan,* [§]*Single-Molecule Bioanalysis Laboratory, National Institute of Advanced Industrial Science and Technology, Takamatsu, Japan*
- PV-19 Rapid Protein Detection on a Microchip without Denaturing** 364
Mari Tabuchi[†], Yasuhiro Kuramitsu[‡], Kazuyuki Nakamura^{‡§}, and Yoshinobu Baba^{†¶}

[†]Department of Medicinal Chemistry, Faculty of Pharmaceutical Sciences, The University of Tokushima, Tokushima, 770-8505, Japan and CREST, [‡]Department of Biochemistry & Biomolecular Recognition, [§]Central Laboratory for Biomedical Research and Education, Yamaguchi University School of Medicine, Ube, 755-8505, Japan, [¶]Single-molecule Bioanalysis Laboratory, National Institute of Advanced Industrial Science and Technology (AIST), Takamatsu, 761-0935, Japan

- PV-20 Thermal Lens Microscope for High-Sensitive Detection of DNA and Protein on a Chip 366**
Hideya Nagata[†], Ken Hirano[†], Mari Tabuchi[†], and Yoshinobu Baba^{†‡}
[†]Department of Medicinal Chemistry, Faculty of Pharmaceutical Sciences, The University of Tokushima, CREST, Japan Science and Technology Corporation (JST), Tokushima 770-8505, Japan, [‡]Single-Molecule Bioanalysis Laboratory, National Institute of Advanced Industrial Science and Technology (AIST), Takamatsu, Japan
- PV-21 The Novel Drug Development: Pyrazoles as Anti-Invasive drugs 60 (abstract)**
Ajay Kumar^{†‡}, Virinder S Parmar[†], Hriday N. Jha[‡], Carl E Olsen[§], and Marc M Mareel[¶]
[†]Bioorganic Laboratory, Department of Chemistry, University of Delhi, Delhi-110 007, India, [‡]Department of Chemistry, MMH College, Ghaziabad, UP, India, [§]Chemistry Department, Royal Veterinary and Agricultural University, 40 Thorvaldsensvej, Frederiksberg C, DK-1871 Copenhagen, Denmark, [¶]Laboratory of Experimental Cancerology, Department of Radiotherapy, Nuclear Medicine and Experimental Cancerology, University Hospital, De Pintelaan 185, B-9000 Gent, Belgium
- PV-22 Profiling Kinase Activity Using Peptide-Based Microarrays 368**
Mahesh Uttamchandani[†], and Shao Q. Yao^{†‡}
[†]Department of Biological Sciences, [‡]Department of Chemistry, National University of Singapore, 3 Science Drive 3, Singapore 117543
- PV-23 Profiling Hydrolytic Enzymes Using Small Molecular Microarray 61 (abstract)**
Zhu Qing[†], Uttamchandani M, Chen, G. Y. J[‡], Shao, and Q. Yao^{†‡}
[†]Department of Chemistry, [‡]Department of Biological Science, National University of Singapore, 3 Science Drive 3, Singapore 117543
- PV-24 Developing Novel Affinity Probes for the Affinity-based Profiling of Metalloproteases 63 (abstract)**
Elaine W.S. Chan[†] and Shao Q. Yao^{†‡}
[†]Department of Chemistry, [‡]Department of Biological Science, National University of Singapore, 3 Science Drive 3, Singapore 117543

プレ・ポストシンポジウム報告

The Ninth International Kyoto Conference on New Aspects of Organic Chemistry (IKCOC-9), which will be held on November 10-14, 2003, at Kyoto Park Hotel, Kyoto, Japan

"Control of Gene Expression by Peptide Nucleic Acids (PNA)"

Peter E. Nielsen (Univ. Copenhagen)



11月26日、大阪大学大学院理学研究科講演会

"Control of Gene Expression by Peptide Nucleic Acids (PNA)"

Peter E. Nielsen (Univ. Copenhagen)



近畿化学協会合成部会ロボット・マイクロ合成研究会第 23 回研究会 (第 11 回公開講演会(東京))

The First Automated Oligosaccharide Synthesizer: Chemistry and Medical Advances

Prof. Peter H. Seeberger (ETH)



12月1日、大阪大学大学院理学研究科講演会

The First Automated Oligosaccharide Synthesizer: Chemistry and Medical Advances

Prof. Peter H. Seeberger (ETH)



ISBC2003 プレシンポジウム

“4th Symposium on DNA / RNA / Protein for Nanotechnology” 報告

科学研究費補助金特定領域研究「DNA / RNA の機能化を目指した化学的新展開」主催の第4回国際ミニシンポジウム、4th Symposium on DNA / RNA / Protein for Nanotechnology に対して生命科学研究会の協賛を頂き、ISBC2003 のレセプション当日 12 月 2 日に ISBC2003 と同じ兵庫県立夢舞台国際会議場 1 F アンフィシアターで開催しました。

科学研究費補助金特定領域研究「DNA / RNA の機能化を目指した化学的新展開」は、「核酸は高機能材料であり、化学的手法を活用することにより、さらなる高機能化が可能である」という視点から研究を推進しているプロジェクトです。社会の高度情報化と多様化が進む中で、これに対応できる革新的な新材料の開発が緊急課題となっています。

ここで要請されるのは、(1)構造が単純で、しかも多くの情報を正確に処理できること、(2)分子レベルで機能し、また、その機能が容易に制御できること、(3)動的な構造を持ち、目的に応じて迅速に諸特性を変化すること、(4)環境汚染の心配がないこと、(5)安価で大量に供給できること、(6)現在のテクノロジーとのマッチングが良いこと などです。この観点で核酸を見た時、その分子構造は全ての要因を満たしています。つまり、核酸は、分子機能材料の素材としてきわめて適しており、無限の可能性を秘めています。今回の「4th Symposium on DNA / RNA / Protein for Nanotechnology」では、遺伝子核酸を化学的手法により修飾・合成・応用することに取り組んでいる世界最先端の研究者の講演を通じてポストゲノムにおける生命化学、特に核酸研究の新しい潮流について議論することを目的としました。

会告などが諸般の事情により遅れたにもかかわらず、60人程度の方々にご参加頂き、ミニシンポジウムに相応しい突っ込んだ議論も盛り上がり、期待以上の成果が上がったと世話役一同喜んでおります。御協賛頂き、有り難うございました。

ISBC2003 プレシンポジウムの案内

ISBC2003 プレシンポジウム;第4回機能性核酸の創製ミニ国際シンポジウム

開催期日:12月2日 9:00~15:40

場 所:兵庫県立淡路夢舞台国際会議場(〒656-2301 兵庫県津名郡東浦町夢舞台 1 番地・

TEL:0799-74-1020 FAX:0799-74-1021;http://www.yumebutai.org/)

参加費:無料(事前も登録不要です。)

ISBC2003 初日、レセプション開催日に同じ会場である淡路夢舞台国際会議場で DNA / RNA / Protein のナノテクノロジーへの応用を視野に入れた最前線の研究を Junghun Suh (Seoul National University), Jik Chin (University of Toronto), Naoki Sugimoto (Konan University), Peter E. Nielsen (University of Copenhagen), Makoto Komiyama (University of Tokyo), Yoshio Okahata (Tokyo Institute of Technology)の

6人の演者からご講演いただきます。ISBC2003 と重複する演者の方も、異なった題目、内容でご講演いただけますので、ISBC2003 参加者もプレシンポジウムに是非ご参加下さい。

4th Symposium on DNA / RNA / Protein for Nanotechnology

Dec. 02, 2003

Conference Hall, Awaji Yumebutai International Conference Center, Hyogo, Japan

09:00 - 09:10 Opening Remark: Makoto Komiyama (University of Tokyo)

Chairman: Makoto Komiyama

09:30 - 10:10 Junghun Suh (Seoul University)

"Artificial Proteases with Site Selectivity and Substrate Selectivity".

10:10 - 10:50 Jik. Chin (Seoul University)

"Cooperativity Between Metal Coordination and H-bonding: From Anion Recognition to Ester, Amide and Phosphate Cleavage"

10:50 - 11:00 Coffee Break

Chairman:

11:00 - 11:40 Naoki Sugimoto (Konan University)

"Thermodynamics of natural and unnatural nucleic acids"

11:40 - 13:00 Lunch

Chairman: Naoki Sugimoto

13:00 - 13:40 Peter E. Nielsen (University of Copenhagen)

"Control of Gene Expression by Peptide Nucleic Acids (PNA)"

Chairman: Naoki Sugimoto

13:40 - 14:20 Makoto Komiyama (University of Tokyo)

"Site-Selective Scission of Nucleic Acids - Leading to New Molecular Biology-"

14:20 - 15:20 Yoshio Okahata (Tokyo Institute of Technology)

"Gravimetric Kinetics of Enzyme Reactions on a QCM"

15:30 - 15:40 Closing Remark: Makoto Komiyama (University of Tokyo)

18:00~ International Symposium on Bioorganic Chemistry 2003
(ISBC2003) Reception

Post-ISBC 2003 in Kyushu University

(post-international symposium on biomolecular chemistry 2003)

日時 : 03/12/06(sat)

場所 : 九州大学国際ホール

参加人数: 50 名程度

プログラム: (講演者名[所属] / 講演タイトル)

Prof. David Fairlie [University of Queensland]

/ Towards Mimics of Protein Surfaces

Prof. Akio Ojida [Kyushu University]

/ Novel Artificial Receptors and chemosensors toward phosphorylated peptide/protein

Prof. Shinya Tsukiji [University of Tokyo]

/ An Alcohol Dehydrogenase Ribozyme

Prof. Shigeki Sasaki [Kyushu University]

/ Molecular Design for Gene-Targeting Strategy

Prof. Takahiko Nojima [Kyushu University]

/ Visualization of DNA duplex region by a new fluorescent peptide

Prof. Young Chang [New York University]

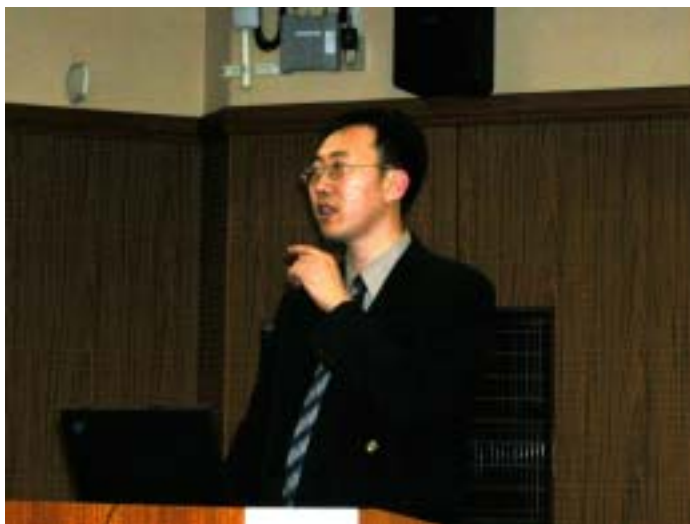
/ Tagged small molecule approach to facilitated chemical genomics and proteomics

Prof. Shigeki Kiyonaka [Kyoto University]

/ Development and application of novel saccharide-based biomaterials by combinatorial approach

Prof. Peter Seeberger [ETH Zurich]

/ Use of Synthetic Oligosaccharides in Glycobiology: Carbohydrate Arrays, Carbohydrate-RNA Interactions and Vaccines



ISBC2003 Post Symposium 報告

大阪府立大学

ニューフロンティア材料研究会

The Society of New Frontier Materials Science and Engineering
(Osaka Prefecture University)

平成 15 年 12 月 8 日 (月) 学術交流会館

第 189 回 講演会

主題

Chemical Biology: 生命現象を制御する化学的アプローチ

21 世紀を迎え、「生物」と「化学」の境界領域というように、従来の学問の枠組みを越えた領域で研究が大きな進展をみせています。特に、この 20 年間に大きく発展した分子生物学は、今や、化学的な物質観なしには研究を進めるのが難しいとまで言われており、生命現象を分子レベルで制御する化学的アプローチが、大きな威力を発揮すると期待されています。また、生物学への化学的アプローチは、プロテオーム、コンビナトリアル・ケミストリー、計算化学などを多用し、それ自身が医薬品の開発に繋がります。今回の講演会では、この新しい分野で世界のトップを走っている研究者を海外からお招きし最新の話題をお話しいただきます。多くの方々のご参加をお願い申し上げます。

講演会 (13:00 ~ 18:00)

講演 1. (13:00 ~ 14:10)

"Designed Polydactyl Zinc Finger Proteins: Building software and hardware for genomes"

Professor Carlos F. Barbas, III

(Department of Molecular Biology, The Scripps Research Institute, USA)

講演 2. (14:10 ~ 15:20)

“ファージ・ライブラリーを基軸とした受容体リガンドの分子設計 (Directed Evolution of Biofunctional Molecules in Phage-displayed Combinatorial Libraries)”

藤井 郁雄 (大阪府立大先端科学研究所・教授)

休憩

講演 3. (15:40 ~ 16:50) :

“New Chemical Genetic Analysis of Cellular Signal Transduction”

Professor Kevan Shokat

(Department of Cellular and Molecular Pharmacology, UC San Francisco, USA)

講演会終了後懇親会 (17:00 ~ 18:00)

平成15年12月8日(月)

学术交流会館

2003年12月8日(月)に ISBC2003 ポストシンポジウムとして、大阪府立大学ニューフロンティア材料研究会第189講演会が開催(開催場所:大阪府立大学学术交流会館)された。まず、大阪府立大学先端科学研究所の藤井郁雄教授により「ファージライブラリーを機軸とした受容体リガンドの分子設計」と題して、Chemical Biology に関する基礎的な解説に続いて、ファージライブラリーを用いた GCSF 受容体に親和性を有するペプチドの取得およびそれに続く低分子化合物の設計について発表された。引き続き、The Scripps Research Institute の Carlos F. Barbas, III 教授により「Designed Polydactyl Zinc Finger Proteins: Building software and hardware for genomes」と題して講演が行われた。Barbas 教授らが最近開発した人工 zinc finger protein による遺伝子発現の制御についての結果が発表された。最後に、UC San Francisco の Kevan Shokat 教授による「New Chemical Genetic Analysis of Cellular Singnal Transduction」と題して、設計された kinase inhibitor と変異 kinase を用いた chemical genetics についての最近の結果が発表された。当日は約100人の参加者による活発な討論が行われた。



藤井郁雄教授



Carlos F. Barbas, III 教授



Kevan Shokat 教授

(大阪府立大学先端科学研究所 円谷 健)

公開セミナー

Professor Tom W. Muir

The Rockefeller University

Selima and Lawrence Ruben Laboratory of Synthetic Protein Chemistry

"The Chemical Biology of Protein Splicing"

平成15年12月8日(月)午後4時00分

東京大学薬学部第一講義室

菊地 和也(内線24853)

長野 哲雄(内線24850)



公開セミナー

Professor Shao Q. Yao

National University of Singapore

Department of Chemistry & Department of Biological Sciences

"Chemical proteomics-An Organic Chemist's perspectives toward Challenges
in the Post-Genome Era-"

平成15年12月8日(月)午後2時00分

東京大学薬学部第一講義室

菊地 和也(内線24853)東京大学大学院薬学系研究科

長野 哲雄(内線24850)東京大学大学院薬学系研究科

三原 久和(045-924-5756)東京工業大学大学院生命理工学研究科



公開セミナー

Professor David P. Giedroc

Texas A&M University, Department of Biochemistry & Biophysics

"Metal Ion Selectivity and Allosteric Switching in Bacterial Metal Sensor Proteins"

平成15年12月9日(火)午後3時30分

東京大学薬学部第一講義室

菊地 和也(内線24853)薬学系研究科

長野 哲雄(内線24850)薬学系研究科

塩谷 光彦(内線28061)理学系研究科化学教室



ISBC ポストコンファレンス (北里大学理学部セミナー)

平成15年12月10日(水) 午後4時30分 ~ 5時30分

S号館3階 セミナー室2・3(310・311)

"Metal Ion Selectivity and Allosteric Switching in Bacterial Metal Sensor Proteins"

(バクテリア金属センサー蛋白質における金属イオン選択性とアロステリックスイッチング)

Prof. David P. Giedroc

Department of Biochemistry and Biophysics, Center for Advanced Biomolecular Research, Texas A&M University, College Station, TX 77843-2128 USA

The SmtB/ArsR family of homodimeric "winged" helix-turn-helix (HTH) proteins represses the expression of operons associated with metal ion sequestration or efflux in bacteria, allowing these organisms to survive when challenged with toxic concentrations of heavy metal ions. Comparative structural and spectroscopic studies of six SmtB/ArsR proteins reveal that individual members harbor one or two pairs of heavy metal binding sites, designated $\alpha 5$ and $\alpha 3N$. Recent insight from x-ray crystallographic and NMR experiments on two related zinc sensors, cyanobacterial SmtB and *S. aureus* CzrA, on the mode of metal binding and the mechanism of metal-induced allosteric switching of low-affinity and high-affinity DNA-binding conformations will be discussed.

理学部化学科反応機構学講座 大石茂郎・石田 斉 (内線:8159)



お知らせコーナー

受賞のお知らせ

叶 直樹氏(理化学研究所(RIKEN)中央研究所 抗生物質研究室)

受賞名: 第45回天然有機化合物討論会奨励賞

Young Investigator Award at the 45th Symposium on Natural Products Chemistry, 2003

「官能基非依存型低分子アレイの作成と評価」

田中健太郎氏(東京大学大学院理学系研究科化学専攻)

受賞名: 錯体化学会研究奨励賞(2003年9月25日)

”Efficient Incorporation of Copper Hydroxypyridone Base Pair in DNA”



会員異動のお知らせ

有賀克彦氏 (2004年1月より)

独立行政法人 物質・材料研究機構 物質研究所 超分子グループ ディレクター

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平野智也氏 (東京大学薬学部薬品代謝化学教室 (長野研) 博士研究員から 2003 年 7 月より)

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編集後記

あけましておめでとうございます。

昨年12月に、第1回生命化学国際会議が淡路島で開催されました。研究会にとってエポックメイキングな出来事であったことは間違いないと思います。大変活気のある会議の中で、皆様はどのような感想をお持ちになられたでしょうか。お聞かせいただければ幸いです。

今回の国際会議の記録のため、特集号として、本号ニュースレターを編集しました。ご参加いただいた方々にはプロシーディングスと重複がありますが、記録として残すという意味でご容赦いただければ幸いです。次号は、国際会議でポスター賞を受賞された方々の寄稿を中心に、来月(2004年2月)、発行予定です。ご期待ください。

国際会議も終えた12月のある日、近所を散歩していて、ミノムシがいらないことに気付きました。農薬とか環境汚染とか、いろいろ可能性を考えながら歩いていましたが、後で、中国から来た「みのがやどりばえ」というはえに寄生されて、絶滅寸前なのだと知りました。交通機関の発展によって、生態系が壊される環境問題が、人工化学物質による汚染より怖いのかもかもしれません。皆さんの周りでも、ミノムシがいらないか、探してみられてはいかがでしょう。

今年も皆様のご研究の益々のご発展を祈念いたしております。



石田 斉 (北里大学理学部)