シンポジウム　Symposium

第 1 日目（10 月 28 日（月））／Day 1（Oct. 28 Mon.）

9:45～12:15　A 会場／Room A：Kyoto Int'l Conf. Center Room B-2

1SAA　新学術領域「人工光合成による太陽光エネルギーの物質変換：実用化に向けての異分野融合」共催
光駆動水分解の分子機構：光化学系Ⅱと人工光合成
Molecular mechanism of light-driven water oxidation: photosystem II and artificial photosynthesis

オーガナイザー：石北 央（大阪大学），野口 巧（名古屋大学）
Organizer: Hiroshi Ishikita (Osaka Univ.), Takumi Noguchi (Nagoya Univ.)

A membrane-pigment complex photosystem II (PSII) uses light to drive water oxidation and oxygen evolution processes (2H2O → O2 + 4H+ + e-), which occur at the catalytic site Mn4Ca cluster. Similar functions of light-driven water oxidation are expected for catalyst design in artificial photosynthesis systems. We will discuss molecular mechanism of light-induced water oxidation in PSII and artificial photosynthesis systems on the basis of experimental researches or theoretical chemical approaches.

1SAA-01　天然光合成における水分解・酸素発生光化学系 II
Water-splitting and oxygen-evolving photosystem II in natural photosynthesis
○神谷 信夫（大阪市立大学）
Nobuo Kamiya (*Osaka City University*)

1SAA-02　ESR 法でわかる Mn クラスターの電子構造と機能
Electronic structure and function of Mn cluster correlated with crystal structure observed by Electron Spin Resonance
○三野 広幸（名大院理）
Hiroyuki Mino (*Grad. Sch. Sci., Nagoya Univ.*)

1SAA-03　QM/MM 法による光合成酸素発生中心 S 1 状態の電子状態解析
QM/MM study on the photosystem II oxygen evolving complex at the S1 state
○庄司 光男[1], 磯部 寛[2], 山中 秀介[3], 神谷 信夫[4], 沈 建仁[2], 山口 兆[3,4]（[1]筑波大・数理物質, [2]岡山大・自然科学, [3]阪大・院理, [4]大阪市大・複合先端）
Mitsuo Shoji[1], Hiroshi Isobe[2], Shusuke Yamanaka[3], Nobuo Kamiya[4], Jian-Ren Shen[2], Kizashi Yamaguchi[3,4] ([1]*Grad. Sch. of Pure and App. Sci., Univ. Tsukuba*, [2]*Grad. Sch. Nat. Sci. & Tec., Okayama Univ.*, [3]*Grad. Sch. Sci, Osaka Univ.*, [4]*OCARINA, Osaka City Univ*)

1SAA-04　多参照波動関数理論で解く光合成系 II マンガンクラスタの電子構造
Entangled quantum electronic wavefunctions of the Mn_4CaO_5 cluster in photosystem II
○倉重 佑輝, 柳井 毅（分子科学研究所）
Yuki Kurashige, Takeshi Yanai (*Institute for Molecular Science*)

1SAA-05　OEC に関する理論的研究
Theoretical Study on OEC
○中村 振一郎（独立行政法人理化学研究所）
Shin Nakamura (*RIKEN*)

1SAA-06　人工的な遷移金属錯体を触媒とする酸素発生反応
Water Oxidation Catalyzed by Artificial Transition Metal Complexes
○正岡 重行（分子研）
Shigeyuki Masaoka (*IMS*)

1SAA-07　人工光合成の構築に向けた水の酸化触媒の開発
Development of molecular catalysts for water oxidation toward artificial photosynthesis
○八木 政行（新潟大・工）
Masayuki Yagi (*Niigata Univ.*)

9:45～12:15　B 会場／Room B：Kyoto Int'l Conf. Center Room B-1

1SBA　新学術領域「感覚と知能を備えた分子ロボットの創成」共催
生物物理学による生体分子ロボットの設計原理の探求
The Exploration of the design principle of biomolecular robots based on biophysics

オーガナイザー：瀧ノ上 正浩（東京工業大学），小宮 健（東京工業大学），齊藤 博英（京都大学）
Organizer: Masahiro Takinoue (Tokyo Inst. Tech.), Ken Komiya (Tokyo Inst. Tech.), Hirohide Saito (Kyoto Univ.)

Life systems are sophisticated "molecular robots" that are hierarchically self-organized using nanometer-sized molecular parts. Due to the cooperative behaviors of the molecular parts, the life systems achieve dynamic functions such as autonomous information processing, autonomous motions, self-replication, etc. To date, biophysics has succeeded in revealing the characteristics of individual biomolecules constituting life systems. As the next step, through the constructive approaches such as synthesis of molecular robots, the working principles of life systems would be explored more deeply. Thus, in this symposium, we introduce these novel approaches and actively discuss their prospects.

1SBA-01　動的人工細胞・分子ロボットの作製のための微小非平衡場の制御
Control of micro-sized nonequilibrium system for the construction of dynamic artificial cells and molecular robots based on microfluidics
○瀧ノ上 正浩（東工大・院総理工）
Masahiro Takinoue (*Interdisciplinary Grad. Sch. Sci. & Eng., Tokyo Tech.*)

1SBA-02　分子ロボティクス指向による人工細胞構築
Molecular robotics approach for constructing an artificial cell model
○野村 M. 慎一郎[1], 藤原 慶[1, 2]（[1]東北大学　工学研究科　バイオロボティクス専攻, [2]日本学術振興会）
Shin-ichiro Nomura M.[1], Kei Fujiwara[1, 2] ([1]*Department of Bioengineering and Robotics, Division of Mechanical Engineering, TOHOKU University*, [2]*JSPS Research Fellows*)

1SBA-03　細胞サイズ液滴内での高分子混合系の相分離とゾル-ゲル転移
Aqueous phase separation and sol-gel transition of biopolymer blend in cell-sized droplets
○柳澤 実穂（九大院・理）
Miho Yanagisawa (*Grad. Sch. Sci., Kyushu Univ.*)

1SBA-04　外部環境情報をリポソーム基盤分子ロボットの内部に伝達する分子センサーの開発
A development of molecular sensor that delivers environmental information to inside of liposome-based molecular robots
○庄田 耕一郎, 陶山 明（東京大学総合文化研究科広域科学専攻生命環境科学系陶山研究室）
Koh-ichiroh Shohda, Akira Suyama (*Department of Life Sciences, Graduate School of Arts and Sciences, The University of Tokyo*)

1SBA-05　アクチン線維とミオシン、細胞サイズの膜小胞を利用した分子アメーバ構築の試み
Construction of motile artificial cell model using actomyosin and cell-sized giant liposome
○滝口 金吾, 林 真人（名古屋大学大学院理学研究科生命理学超分子機能学講座）
Kingo Takiguchi, Masahito Hayashi (*Grad. Sch. Sci., Nagoya Univ.*)

1SBA-06　人工 RNA-Protein 複合体による細胞内外で機能する分子ロボットの創出にむけて
Synthetic RNA-Protein complexes to construct molecular robot in vitro and in cells
○齊藤 博英[1,2]（[1]京都大学 iPS細胞研究所, [2]京都大学 白眉センター）
Hirohide Saito[1,2] ([1]*CiRA*, [2]*The Hakubi Center for Advanced Research*)

1SBA-07　分子ロボットを制御する試験管内知能の実装
Implementation of *in vitro* intelligence for controlling molecular robots
○小宮 健（東工大・院総理）
Ken Komiya (*Interdisci. Grad. Sch. Sci. & Engi., Tokyo Tech.*)

9:45～12:15　C 会場／Room C：Kyoto Int'l Conf. Center Room C-1

1SCA　生命システムの情報ダイナミクス
Information Dynamics in Biological Systems

オーガナイザー：小林 徹也（東京大学），黒田 真也（東京大学）
Organizer: Tetsuya J. Kobayashi (The Univ. of Tokyo), Shinya Kuroda (The Univ. of Tokyo)

Life is intrinsically dynamic and non-equilibrium phenomenon in which time and causality plays pivotal roles. This fact, on the one hand,enables us to extract parametric and non-parametric information on underlying processes from time-series and population data.
On the other hand, it suggests that biological systems are evolutionary designed so as to exploit its dynamic nature for transmitting and processing information under stochastic environment. In this symposium, we introduce cutting edge research on information dynamics and discuss its impact for understanding physical and information-theoretical principles in biological systems.

1SCA-01　遺伝子発現過程の情報ダイナミクス
Information Dynamics in Gene Expression Processes
○谷口 雄一（理化学研究所生命システム研究センター）
Yuichi Taniguchi (*Quantitative Biology Center, RIKEN*)

1SCA-02　Inferring Kinetics Objectively from Single Molecule Time Series with Full Information Content
Li Chun-Biu (*Research Institute for Electronic Science, Hokkaido University*)

1SCA-03　確率的な細胞環境感知における適応的ダイナミクスの役割
Role of Adaptive Dynamics in Stochastic Cellular Sensing Systems
○小林 徹也（東大、生産研）
Tetsuya Kobayashi (*IIS, Univ. Tokyo*)

1SCA-04　細胞内時空間データからの方程式推定
Estimating inner-cell dynamics from spatio-temporal data
○石原 秀至[1], 谷口 大相[1], 澤井 哲[1,2]（[1]東京大学大学院総合文化研究科, [2]JSTさきがけ）
Shuji Ishihara[1], Daisuke Taniguhi[1], Satoshi Sawai[1,2] ([1]*Graduate school of Arts and Sciences, The University of Tokyo*, [2]*JST PERSTO*)

1SCA-05　確率的な ERK 活性ダイナミクスと細胞増殖制御
Stochastic ERK activity pulses induced by noise and cell-to-cell propagation regulate cell density-dependent proliferation
○青木 一洋（京都大学大学院医学研究科 時空間情報イメージング拠点）
Kazuhiro Aoki (*Kyoto University, Graduate School of Medicine, Imaging Platform for Spatio-Temporal Information*)

1SCA-06　細胞内シグナル伝達経路の情報コーディング
Information coding of cellular signaling networks
○黒田 真也, 宇田 新介（東京大学理学系研究科生物化学専攻）
Shinya Kuroda, Shinsuke Uda (*Biophys. Biochem., University of Tokyo*)

9:45～12:15　D 会場／Room D：Kyoto Int'l Conf. Center Room D

1SDA　新学術領域「運動超分子マシナリーが織りなす調和と多様性」共催
バーグ教授記念講演と踊る運動超分子マシナリー
Prof Berg's featured lecture and dancing harmonized motility machineries

オーガナイザー：宮田 真人（大阪市立大学），佐藤 啓子（長崎大学）
Organizer: Makoto Miyata (Osaka City Univ.), Keiko Sato (Nagasaki Univ.)

Prof Berg at Harvard University, a pioneer of single molecule measurements has lead "biophysics", including our society for more than 40 years. He focused mainly on bacterial behaviors including motor and signal transduction, and achieved single molecule and in vivo measurements. In this symposium, he will give us special messages and also we will enjoy discussion about related several subjects.

1SDA-01 タンパク質膜透過促進因子 SecDF の構造と機能
Structure and function of SecDF, a membrane integrated protein translocation enhancing factor
○森 博幸[1], 三登 一八[1], 町田 裕紀子[1], 塚崎 智也[2,3], 伊藤 維昭[4], 秋山 芳展[1]（[1]京都大学・ウイルス研究所, [2]奈良先端科学技術大学院大学・バイオサイエンス研究科, [3]科学技術振興機構・さきがけ, [4]京都産業大学・総合生命科学部）
Hiroyuki Mori[1], Kazuya Mito[1], Yukiko Machida[1], Tomoya Tsukazaki[2,3], Koreaki Ito[4], Yoshinori Akiyama[1] ([1]*Institute for Virus Research, Kyoto University*, [2]*Grad. Sch. of Biol. Sci., NAIST*, [3]*JST, PRESTO*, [4]*Faculty of Life Sciences, Kyoto Sangyo University*)

1SDA-02 細菌べん毛ディスタルロッドの構造解析
High-resolution structure of the bacterial flagellar distal rod
○西條 由見子[1], 今田 勝巳[2], 松波 秀行[3], 藤井 高志[4], 難波 啓一[1,4]（[1]阪大・院生命機能, [2]阪大・院理・高分子, [3]沖縄科技大・細胞膜通過輸送研究ユニット, [4]理研・生命システム研究センター）
Yumiko Saijo-Hamano[1], Katsumi Imada[2], Hideyuki Matsunami[3], Takashi Fujii[4], Keiichi Namba[1,4] ([1]*FBS. Osaka Univ.*, [2]*Dept. Macromol. Sci., Grad. Sch. Sci., Osaka Univ.*, [3]*Trans-Membrane Trafficking Unit, OIST*, [4]*QBiC, RIKEN*)

1SDA-03 バチルス属細菌のべん毛モーター固定子のイオン選択性と運動性
One stator that couples to multiple different ions: flagellar stator and motility of *Bacillus* spp.
○伊藤 政博（東洋大 生命科）
Masahiro Ito (*Fac. Life Sci., Toyo Univ.*)

1SDA-04 バクテリア運動の驚異
Wonders of bacterial motility
○バーグ ハワード（ハーバード大学）
Howard C Berg (*Department of Molecular & Cellular Biology and of Physics, Harvard University*)

生体運動研究の昔と今
○大沢 文夫[1,2]（[1]大阪大学, [2]名古屋大学）
Fumio Oosawa[1,2] ([1]*Osaka Univ.*, [2]*Nagoya Univ.*)

16:00～18:30　A 会場／Room A：Kyoto Int'l Conf. Center Room B-2

1SAP　新学術領域「植物の環境感覚：刺激受容から細胞応答まで」共催
カラフルな植物光環境感覚タンパク質
Colorful plant light-perceptive proteins

オーガナイザー：徳富 哲（大阪府立大学），細川 陽一郎（奈良先端科学技術大学院大学）
Organizer: Satoru Tokutomi (Osaka Pref. Univ.), Yoichiroh Hosokawa (NAIST)

Plants sense various environmental signals for their biological responses such as seed germination, shoot growth and development, flowering and so on. Light is one of the most important environmental signals for photosynthetic plants and plants have acquired a variety of photoreceptors during the evolutional processes. The absorptions of the photoreceptors range from far-red to UV-A light. In this Symposium, the frontier research on these colorful plant photoreceptors will be introduced.

1SAP-01 UV-B photoreception by plant UVR8
John Christie (*University of Glasgow*)

1SAP-02 植物における CPD 光回復酵素と UVB 抵抗性
UVB-induced DNA damage repair enzyme “CPD photolyase” and UVB resistance in plant
○日出間 純（東北大・院・生命科学）
Jun Hidema (*Grad. Sch. Life Sci. Tohoku Univ.*)

1SAP-03 植物の青色光受容体 phototropin の全長でのシグナリング機構
Signaling mechanism in full-length phototropin, plant blue light receptor
○岡島 公司（大阪府大・理）
Koji Okajima (*Osaka Pref. Univ.*)

1SAP-04 植物における青色光に依存した気孔開口
Blue light-dependent stomatal opening in plants
○島崎 研一郎, 武宮 淳史（九大・院理・生物）
Ken-ichiro Shimazaki, Atsushi Takemiya (*Dept. of Biol., Kyushu Univ.*)

1SAP-05 フォトトロピンで誘導される葉緑体と核の運動機構
The mechanisms of chloroplast and nuclear movement mediated by blue light receptor phototropins
○和田 正三（九州大学）
Masamitsu Wada (*Kyushu University*)

1SAP-06 フィトクロム A のモジュラー構造
The modular structure of phytochrome A
○長谷 あきら[1], 岡 義人[1,2], 小野 裕也[1], 吉川 由希子[1], 小鍛治 敬生[1], 望月 伸悦[1]（[1]京大院・理, [2]理研・植物セ）
Akira Nagatani[1], Yoshito Oka[1,2], Yuya Ono[1], Yukiko Yoshikawa[1], Keio Kokaji[1], Nobuyoshi Mochizuki[1] ([1]*Grad. Sch. Sci., Kyoto Univ.*, [2]*Plant Sci. Center, RIKEN*)

1SAP-07 新規光受容体群シアノバクテリオクロムの吸収波長調節メカニズム
Color tuning mechanism of novel photoreceptors cyanobacteriochrome
○成川 礼[1,2]（[1]東大・院・総合文化, [2]JST・さきがけ）
Rei Narikawa[1,2] ([1]*Univ. of Tokyo, Dept. of Life Sci.*, [2]*JST, PRESTO*)

16:00～18:30　B 会場／Room B：Kyoto Int'l Conf. Center Room B-1

1SBP　進化する 1 分子シークエンサー
Advanced Single Molecule Sequencing System

オーガナイザー：上村 想太郎（理化学研究所），谷口 正輝（大阪大学）
Organizer: Sotaro Uemura (RIKEN), Masateru Taniguchi (Osaka Univ.)

Single molecule sequencing system is one of the powerful tool for gene analysis widely. It has been greatly advancing for many varieties of applications in fact that its function is no longer just sequence but also a multianalyzer for gene analysis. However, most of technologies behind it base on the cutting edge technologies on single molecule biophysics. In this symposium, we invited frontier scientists working on single molecule sequencing system including bioinformatics for their interesting talks and discussion.

1SBP-01 1 細胞解析のための 1 分子シーケンシングシステムの開発
Development of Single Molecule Sequencing System for Single Cell Analysis
○上村 想太郎（理化学研究所ライフサイエンス技術基盤研究センター）
Sotaro Uemura (*RIKEN Center for Life Science Technologies*)

1SBP-02 REAL-TIME MONITORING OF BIOMOLECULES IN ZERO-MODE WAVEGUIDES: DNA SEQUENCING AND BEYOND
Paul Peluso (*Pacific Biosciences*)

1SBP-03 タンパク質翻訳伸長過程の実時間ダイナミクス計測
Dynamics of translation elongation in real time
○Puglisi Joseph, Tsai Albert, Chen Jin, Kornbeg Guy, Jonansson Magnus, Petrov Alexey, O'Leary Sean, Mark Capece（スタンフォード大学医学部構造生物学科）
Joseph Puglisi, Albert Tsai, Jin Chen, Guy Kornbeg, Magnus Jonansson, Alexey Petrov, Sean O'Leary, Capece Mark (*Department of Structural Biology, Stanford University School of Medicine*)

1SBP-04 Single Molecule Electrical Sequencing of DNA and microRNA
Masateru Taniguchi (*The Institute of Scientific and Industrial Research, Osaka University*)

1SBP-05 類似配列の高速な全ペア列挙に基づく NGS データの解析手法
NGS data analyses based on ultra-fast all pairs similarity search
○清水 佳奈（産業技術総合研究所 生命情報工学研究センター）
Kana Shimizu (*Computational Biology Research Center, National Institute of Advanced Industrial Science and Technology*)

16:00～18:30　C 会場／Room C：Kyoto Int'l Conf. Center Room C-1

1SCP　*In vivo* の生物物理学への挑戦
Challenges to *in vivo* biophysics

オーガナイザー：杉 拓磨（京都大学），大澤 志津江（京都大学）
Organizer: Takuma Sugi (Kyoto Univ.), Shizue Ohsawa (Kyoto Univ.)

The famous textbook "PHYSICAL BIOLOGY OF THE CELL" usually tells us the mechanism of how signaling molecules are regulated in intracellular regions based on well-accumulated *in vitro* biophysical studies. However, do we know how such mechanisms work *in vivo*? In multicellular organisms, normal development and biological functions are coordinated by inter-cellular network through cell-cell communications, although the underlying mechanisms *in vivo* remain elusive. In this symposium, we invite speakers who challenge to this problem using animal model systems and tell how cells and molecules behave *in vivo*.

1SCP-01　細胞競合を介した上皮の恒常性維持機構の分子基盤
Cell competition that regulates epithelial maintenance in Drosophila
○大澤 志津江[1], 國政 啓[1], 井垣 達吏[1,2]（[1]京都大学大学院生命科学研究科 システム機能学分野, [2]科学技術振興機構さきがけ）
Shizue Ohsawa[1], Kei Kunimasa[1], Tatsushi Igaki[1,2] ([1]*Lab.Genetics, Grad. Sch. Biostudies, Kyoto Univ.*, [2]*PRESTO, JST, Japan*)

1SCP-02　胚サイズ依存的な背腹軸パターンのスケーリング機構
Scaling of Dorsal-Ventral Patterning by Embryo Size-Dependent Degradation of Chordin
○猪股 秀彦, 柴田 達夫, 笹井 芳樹（理研・CDB）
Hidehiko Inomata, Tatsuo Shibata, Yoshiki Sasai (*CDB., RIKEN*)

1SCP-03　低温環境下の概日リズムの普遍性
Universality of circadian rhythms under low temperature conditions
○伊藤 浩史[1], 村山 依子[2], 冨田 淳[3], 近藤 孝男[4], 郡 宏[5], 八木田 和弘[6]（[1]九州大学芸術工学研究院, [2]熊本大学大学院先導機構, [3]熊本大学発生医学研究所, [4]名古屋大学, [5]お茶の水女子大学, [6]京都府立医大）
Hiroshi Ito[1], Yoriko Murayama[2], Jun Tomita[3], Takao Kondo[4], Hiroshi Kori[5], Kazuhiro Yagita[6] ([1]*Faculty of Design, Kyushu University*, [2]*Priority Organization for Innovation and Excellence, Kumamoto University*, [3]*Institute of Molecular Embryology and Genetics, Kumamoto University*, [4]*Nagoya University*, [5]*Ochanomizu Univerisity*, [6]*Kyoto Prefectural University of Medicine*)

1SCP-04　ハエトリグモの奥行き知覚における視物質の吸収特性の寄与
Contribution of a visual pigment absorption spectrum to depth perception in the jumping spider
○永田 崇（総研大・先導研）
Takashi Nagata (*Dept Evol Stud Biol Sys, Sokendai-Hayama*)

1SCP-05　Optically detected magnetic resonance spectroscopy of nitrogen-vacancy centers for subnanoscopic measurement in vivo
Ryuji Igarashi[1], Yuta Kumiya[1], Takuma Sugi[2], Fuminori Sugihara[3], Hidehito Tochio[1], Yousuke Yoshinari[2], Yoshie Harada[2], Masahiro Shirakawa[1] ([1]*Department of Molecular Engineering, Graduate School of Engineering, Kyoto University*, [2]*Institute for Integrated Cell-Material Sciences (WPI-iCeMS), Kyoto University*, [3]*Immunology Frontier Research Center (WPI-iFReC), Osaka University*)

1SCP-06　カイメン体内で細胞及び組織が共同作業で骨片を１つ１つ組み上げて立てる建築物「骨片骨格」形成の仕組み
HOW DO SPONGE CELLS BUILD UP THE HIERARCHICAL SPICULOUS SKELETON?
○船山 典子（京都大学 大学院理学研究科 生物科学専攻 生物物理学教室 分子発生）
Noriko Funayama (*Department of Biophysics, Graduate School of Science, Kyoto Univ.*)

1SCP-07　Synergistic action of mitosis and cell shape change in epithelial invagination
Takefumi Kondo, Shigeo Hayashi (*RIKEN CDB*)

1SCP-08　生きるための細胞死～脳形態形成過程に細胞死が与える影響
Cell death for life ~ Impact of apoptosis on morphogenesis in brain development
○山口 良文（東京大学大学院薬学系研究科遺伝学教室）
Yoshifumi Yamaguchi (*Department of Genetics, Graduate School of Pharmaceutical Sciences, University of Tokyo*)

1SCP-09 線虫 *C. elegans* の振動への馴化学習とその記憶の生物物理学的解析
Biophysical analysis of *C. elegans* mechanosensory learning and memory
○杉 拓磨[1,2]（[1]京大・iCeMS, [2]JST-PRESTO）
Takuma Sugi[1,2] ([1]*iCeMS, Kyoto Univ.*, [2]*JST-PRESTO*)

16:00～18:30　D 会場／Room D：Kyoto Int'l Conf. Center Room D

1SDP　構成アプローチの進展によって見えてきた細胞合成
Developments in constructive approach towards cell synthesis

オーガナイザー：木賀 大介（東京工業大学），野地 博行（東京大学）
Organizer: Daisuke Kiga (Tokyo Inst. Tech.), Hiroyuki Noji (The Univ. of Tokyo)

With regard to basic question that "what is cell", constructive approach to combine biomolecules has been developed, in this decade, for broad field of life science. This approach is complementary to traditional approach based on screening and analysis. At this symposium relevant to cell synthesis, we will introduce the newest research including micro fabrication technology and social impact of our field. With these lines of information, we would also like to discuss the idea of "synthesizing cell".

1SDP-01 Systems and Synthetic Biology of Biological Timings
Hiroki R. Ueda (*QBiC Riken*)

1SDP-02 無細胞合成系によるタンパク質進化技術
Protein evolution by cell-free synthesis system
○今村 千絵（豊田中央研究所）
Chie Imamura (*Toyota CRDL*)

1SDP-03 バクテリア生命システムとマイクロデバイスの融合
Hybrid system from a bacterium and a micro-device
○田端 和仁, 渡邊 力也, 野地 博行（東京大学大学院工学系研究科大学院応用化学専攻）
Kazuhito Tabata, Rikiya Watanabe, Hiroyuki Noji (*Grad. sch. eng., Univ. of Tokyo*)

1SDP-04 人工細胞の進化実験
Experimental evolution of artificial cell model
○四方 哲也[1,2]（[1]大阪大学大学院情報科学研究科, [2]科学技術振興機構 ERATOプロジェクト）
Tetsuya Yomo[1,2] ([1]*Graduate School of Information technology, Osaka University*, [2]*ERATO, JST*)

1SDP-05 合成生物学と美学
Aesthetics related with synthetic biology
○岩崎 秀雄[1,2]（[1]metaPhorest [生命美学プラットフォーム], [2]早大・理工）
Hideo Iwasaki[1,2] ([1]*metaPhorest [BioAesthetics Platform]*, [2]*Waseda Univ.*)

16:00～18:30　E 会場／Room E：Kyoto Int'l Conf. Center Room E

1SEP　新学術領域「天然変性タンパク質の分子認識機構と機能発現―生理的準安定状態を捉える新技術―」共催
相関構造生物学とX線溶液散乱
Integrative structural biology and biomolecular SAXS

オーガナイザー：佐藤 衛（横浜市立大学），清水 伸隆（高エネルギー加速器研究機構）
Organizer: Mamoru Sato (Yokohama City Univ.), Nobutaka Shimizu (KEK)

For deeper understanding of biomolecular function, it is important to analyze from many structural aspects combining several techniques in which the obtained resolution and the characteristic differ. SAXS is a method to obtain the low-resolution structure of biomolecule in solution. It is important to discuss about the structure-function relationship of biomolecules in the still larger space scale by combining a high resolution crystal structure analysis with the ab-initio low-resolution structure analysis in solution. In this symposium, not only the newest results but the current advancement of instrumentation in biomolecular SAXS will be presented.

1SEP-01 Computational Analyses of Protein Structures by Small Angle X-ray Scattering
Masaki Kojima, Yasumasa Morimoto, Takashi Nakagawa (*Tokyo University of Pharmacy and Life Sciences*)

1SEP-02 X線溶液散乱と分子動力学シミュレーションで探る蛋白質の構造揺らぎ
Protein structural fluctuations investigated by small-angle X-ray solution scattering and molecular dynamics simulations
○笠口 友隆[1], 池口 満徳[2]（[1]慶應義塾大学・理工学部・物理学科, [2]横浜市立大学・生命医科学研究科・生命医科学専攻）
Tomotaka Oroguchi[1], Mitsunori Ikeguchi[2] ([1]*Department of Physics, Faculty of Science and Technology, Keio University*, [2]*Graduate School of Medical Life Science, Yokohama City University*)

1SEP-03 カルビン回路調節複合体の SAXS と XRD による相関構造解析
Combined SAXS and XRD analysis of the Calvin cycle regulatory complex
○松村 浩由[1], 清水 伸隆[2], 井上 豪[1]（[1]大阪大学, [2]高エネルギー加速器研究機構）
Hiroyoshi Matsumura[1], Nobutaka Shimizu[2], Tsuyoshi Inoue[1] ([1]*Osaka University*, [2]*KEK*)

1SEP-04 結晶構造解析と小角散乱の併用
Applications of SAXS in structural analysis with macromolecular crystallography
○姚 閔（北海道大学大学院先端生命科学研究院）
Min Yao (*Faculty of Advanced Life Science*)

1SEP-05 フォトンファクトリーにおける小角散乱ビームラインの刷新
Refurbishment of SAXS beamlines at Photon Factory
○清水 伸隆（高エネ機構、物構研）
Nobutaka Shimizu (*IMSS, KEK*)

1SEP-06 SPring-8 理研構造生物学ビームライン I（BL45XU）の現状
Current status of RIKEN Structural Biology Beamline I (BL45XU) at SPring-8
○引間 孝明[1], 佐藤 広美[1], 河野 能顕[1], 上野 剛[1], 平田 邦生[1], 村上 博則[1], 八木 直人[1,2], 山本 雅貴[1]（[1]理研SPring-8センター, [2]JASRI/SPring-8）
Takaaki Hikima[1], Hiromi Sato[1], Yoshiaki Kawano[1], Go Ueno[1], Kunio Hirata[1], Hironori Murakami[1], Naoto Yagi[1,2], Masaki Yamamoto[1] ([1]*RIKEN SPring-8 Center*, [2]*JASRI/SPring-8*)

第 2 日目（10 月 29 日（火））／Day 2（Oct. 29 Tue.）

8:45～11:15　A 会場／Room A：Kyoto Int'l Conf. Center Room B-2
2SAA　生物ダイナミズムの源泉を問う―“非生物的揺らぎ”が生み出す“生物的揺らぎ”
Searching for the origins of the dynamism of life - how do random fluctuations turn into biological motions?

オーガナイザー：赤坂 一之（近畿大学），織田 昌幸（京都府立大学）
Organizer: Kazuyuki Akasaka (Kinki Univ.), Masayuki Oda (Kyoto Pref. Univ.)

The dynamism of all life on earth depends critically on the dynamism of bio-macromolecules themselves, most notably proteins. The origins of their conformational dynamism are actually “weak” interatomic potentials that fluctuate under physiological conditions. The fascination lies in the fact that the intrinsically random “non-biological fluctuations” of atoms and molecules are turned into specific “biological motions” to keep life going (like flowering, singing, running), by the work of life itself in the 38 billion years of evolution. Strategies for the fascinating works are beginning to be revealed through atomic, macromolecular, cellular and body levels, with “pressure” as the common variable.

2SAA-01 “非生物的揺らぎ”から“生物的揺らぎ”へ：そのからくりを問う
Turning random fluctuations into biological motions: the art work by Nature
○赤坂 一之（近畿大学先端技術総合研究所高圧力蛋白質研究センター）
Kazuyuki Akasaka (*High Pressure Protein Research Center, Institute of Adanced Technology, Kinki Univversity*)

2SAA-02 非生物的揺らぎから“生物的揺らぎ”への“水”の役割
Role of water to convert “non-biological” fluctuation to the “biological” one
○平田 文男（立命館大）
Fumio Hirata (*Univ.Ritsumeikan*)

2SAA-03 キャビティに依存した c-Myb R2R3 の構造揺らぎと DNA 結合能
Cavity-dependent conformational fluctuation and DNA-binding function of c-Myb R2R3
○織田 昌幸（京府大・院生命環境科学）
Masayuki Oda (*Grad. Sch. Life and Environ. Sci., Kyoto Pref. Univ.*)

2SAA-04 圧力摂動やアミノ酸変異により生じる生物的揺らぎの変化：ユビキチン
Pressure and mutation enhances specific biological motion: Ubiquitin
○北原 亮（立命館大・薬）
Ryo Kitahara (*College of Pharm. Sci., Ritsumeikan Univ.*)

2SAA-05 イオンチャネルのゆらぎは細胞応答にどのように利用されているのか？
How do cells make use of single channel fluctuations for their responses?
○曽我部 正博（名古屋大・院医・メカノバイオロジー）
Masahiro Sokabe (*Mechanobiol. lab., Nagoya Univ. Grad. Sch. Med.*)

2SAA-06 ヒトで最進化した重力適応：揺らぎの階層性と分子シャペロン
Gravitational adaptation, evolved at the most in the human being: hierarchy of fluctuation and molecular chaperone
○跡見 順子[1], 藤田 恵理[1], 清水 美穂[1], 跡見 友章[2], 廣瀬 昇[2], 田中 和哉[2], 長谷川 克也[3]（[1]農工大院工・材料健康科学, [2]帝京科学大・理学療法, [3]宇宙航空研究開発機構）
Yoriko Atomi[1], Eri Fujita[1], Miho Shimizu[1], Tomoaki Atomi[2], Noboru Hirose[2], Kazuya Tanaka[2], Katsuya Hasegawa[3] ([1]*Tokyo Univ. of Agr. and Tech.*, [2]*Teikyo Univ. Sci.*, [3]*JAXA*)

8:45～11:15　B 会場／Room B：Kyoto Int'l Conf. Center Room B-1

2SBA　反応場デザインによる生命現象の再構成　-創って知る生物物理-
Reconstitution of life phenomena in a designed reaction field: Synthetic biology approach to Biophysics

オーガナイザー：多田隈 尚史（東京大学），古田 健也（情報通信研究機構），田川 美穂（名古屋大学）
Organizer: Hisashi Tadakuma (the Univ. of Tokyo), Ken'ya Furuta (NICT), Miho Tagawa (Nagoya Univ.)

Recent progresses in technology allow us to design the reaction field. In this symposium, we will focus on the motor protein / cytoskeletal function in designed reaction field to get to the heart of biological nanosystems.

2SBA-01 Designing the nano-reaction field: Introduction and application to motor protein research
Hisashi Tadakuma (*Graduate School of Frontier Science, The University of Tokyo*)

2SBA-02 Programming Nucleic Acids Self-Assembly
Peng Yin (*Wyss Institute for Biologically Inspired Engineering*)

2SBA-03 DNA セルフアセンブリによるナノ粒子超構造制御
DNA-mediated Nanoparticle Assembly
○田川 美穂[1], 磯貝 卓巳[1], 赤田 英里[1], 原田 俊太[1], 宇治原 徹[1], ヤンガー ケビン[2], ガング オレグ[2]（[1]名大・院工・マテリアル理工, [2]ブルックヘブン国研）
Miho Tagawa[1], Takumi Isogai[1], Eri Akada[1], Syunta Harada[1], Toru Ujihara[1], Kevin Yanger[2], Oleg Gang[2] ([1]*Dep. of Materials Sci. and Eng., Nagoya Univ.*, [2]*Brookhaven Nat. Lab.*)

2SBA-04 DNA ナノ構造上での分子運動の直接観察
Direct observation of molecular motions on the DNA nanostructure
○遠藤 政幸（京都大学 物質―細胞統合システム拠点）
Masayuki Endo (*Institute for Integrated Cell-Material Sciences, Kyoto University*)

2SBA-05 モータータンパク質集合体の自己組織化を操る
Controlling self-assembly of motor protein ensembles
○古田 健也（情報通研・バイオICT）
Ken'ya Furuta (*Bio ICT lab, NICT*)

2SBA-06 ミクロ閉鎖空間でアクトミオシン集合体がつくる秩序構造
Self-organized pattern formation by actomyosin mixtures in a cell-size confined space
○宮崎 牧人[1], 千葉 雅隆[1], 江口 宙輝[1], 石渡 信一[1,2]（[1]早大・物理, [2]早稲田バイオサイエンスシンガポール研究所）
Makito Miyazaki[1], Masataka Chiba[1], Hiroki Eguchi[1], Shin'ichi Ishiwata[1,2] ([1]*Dept. of Physics, Waseda Univ.*, [2]*WABIOS, Waseda Univ.*)

2SBA-07 Directed actin self assembly and contractility
Laurent Blanchoin (*CEA Grenoble*)

8:45～11:15　C 会場／Room C：Kyoto Int'l Conf. Center Room C-1

2SCA　最新イオンチャネル 1 分子科学: 素過程から疾患克服まで
Single Ion Channels updated: From elementary processes to disease treatments

オーガナイザー：相馬 義郎（慶應義塾大学），老木 成稔（福井大学）
Organizer: Yoshiro Sohma (Keio Univ.), Shigetoshi Oiki (Univ. of Fukui)

Ion channels play pivotal roles in a number of essential physiological processes, and their dysfunctions lead to various human diseases. Ion channels are efficient targets of the pharmaceutical therapy and, historically, the single-molecule studies including the patch-clamp technique have successfully accelerated the channel-targeting drug developments. Recently the single molecule sciences *in vivo*, *in vitro* and *in silico* have been greatly advanced. This symposium is designed to mediate a closer interaction between biophysicists and physiologists for further inspiring each other.

2SCA-01 カリウムイオンチャネル KcsA のゲート開閉とリンクした脂質膜中での集合・離散ダイナミクス
Gating-related clustering-dispersion dynamics of the KcsA potassium channel on the membrane
○角野 歩[1], 山本 大輔[2], 炭竈 享司[1], 岩本 真幸[1], 出羽 毅久[3], 老木 成稔[1]（[1]福井大医, [2]福岡大理, [3]名工大院工）
Ayumi Sumino[1], Daisuke Yamamoto[2], Takashi Sumikama[1], Masayuki Iwamoto[1], Takehisa Dewa[3], Shigetoshi Oiki[1] ([1]*Fac. Med. Sci., Univ. Fukui*, [2]*Fac. Sci., Univ. Fukuoka*, [3]*Grad. Sch. Eng., Nagoya Inst. Tech.*)

2SCA-02 薬理解析により明らかになった、原核生物由来の膜電位感受性 Na チャネルにおける内腔の構造変化
The conformational rearrangement of the inner vestibule revealed by the pharmacological analysis of prokaryotic voltage-gated Na channels
○下村 拓史, 入江 克雅, 藤吉 好則（名大・細胞生理学研究センター）
Takushi Shimomura, Katsumasa Irie, Yoshinori Fujiyoshi (*CeSPI, Univ. Nagoya*)

2SCA-03 電位依存性 K+チャネルにおけるイオン透過機構に関する分子動力学的検討
Molecular Dynamics Study on Ion Conduction Mechanisms of a Voltage-sensitive Potassium Channel
○笠原 浩太[1], 城田 松之[2,3], 齊藤 俊幸[2], 近藤 寛子[2], 木下 賢吾[2,3,4]（[1]阪大蛋白研, [2]東北大院情報, [3]東北大ToMMo, [4]東北大加齢研）
Kota Kasahara[1], Matsuyuki Shirota[2,3], Toshiyuki Saito[2], Hiroko Kondo[2], Kengo Kinoshita[2,3,4] ([1]*IPR, Osaka Univ.*, [2]*Grad. Sch. Information Sci, Tohoku Univ.*, [3]*ToMMo, Tohoku Univ.*, [4]*IDAC, Tohoku Univ.*)

2SCA-04 Ligand-induced conformational changes in the cytoplasmic domain of inward rectifier potassium channels
Atsushi Inanobe (*Dept. Pharmacol., Grad. Sch. Med., Osaka Univ.*)

2SCA-05 高速 AFM によるアクアポリン 4 チャネルの直接観察
Direct observation of aquaporin-4 channels by high speed AFM
○山下 隼人, 会津 心之亮, 加藤 純悟, 阿部 陽一郎, 安井 正人, 相馬 義郎（慶應大・医・薬理学）
Hayato Yamashita, Shinnosuke Aizu, Jungo Kato, Yoichiro Abe, Masato Yasui, Yoshiro Sohma (*Pharmacol., Keio Univ. Med. Sch.*)

8:45～11:15　D 会場／Room D：Kyoto Int'l Conf. Center Room D

2SDA　新学術領域「少数性生物学―個と多数の狭間が織りなす生命現象の探究―」共催
少数個分子の協同が生み出す生命機能のメカニズム
Biological functions derived from cooperation of a small number of molecules

オーガナイザー：政池 知子（東京理科大学），広瀬 恵子（産業技術総合研究所）
Organizer: Tomoko Masaike (Tokyo Univ. of Sci.), Keiko Hirose (AIST)

Many of the biological processes utilize systems containing relatively small numbers of molecules. By cooperation, these molecules gain new functions, which cannot be explained by mere addition of the functions of individual molecules. Also, these systems cannot be readily studied by the methods we have been using for single molecules. In this symposium, we focus on recent progress in studying the mechanisms by which ensembles of a small number of molecules work.

2SDA-01　少数個分子の協働：その機構と意味解明へのアプローチ
Approaches to understand cooperative systems of small numbers of molecules
○広瀬 恵子（産総研・バイオメディカル）
Keiko Hirose (*Biomedical Res. Inst., AIST*)

2SDA-02　神経軸索への極性輸送の構造的基盤
Structural Basis for the Polarized Axonal Transport in Neuron
○岡田 康志（理研 生命システム研究センター）
Yasushi Okada (*QBiC RIKEN*)

2SDA-03　Microtubule organisation and dynamics in the anaphase spindle: properties of Cin8
Thomas Surrey (*Cancer Research UK*)

2SDA-04　生細胞内少数分子を調べるための蛋白質ラベル化技術
Protein labeling technology for investigating small number molecules in living cells
○水上 進[1,2]（[1]大阪大学大学院工学研究科生命先端工学専攻, [2]大阪大学免疫学フロンティアセンター）
Shin Mizukami[1,2] ([1]*Osaka Univ., Graduate School of Engineering*, [2]*Osaka Univ., IFReC*)

2SDA-05　１個から数個の分子が引き起こす運動と酵素反応のイメージング
Imaging of single to a few number of molecules in motion and their enzymatic reactions
○政池 知子[1,2], 池上 浩司[3], 瀬藤 光利[3], 鈴木 裕[4], 西坂 崇之[5]（[1]東京理科大・理工・応用生物科学, [2]JST さきがけ, [3]浜松医大・解剖学講座・細胞生物学分野, [4]旭川医大・生化学講座, [5]学習院大・理・物理）
Tomoko Masaike[1,2], Koji Ikegami[3], Mitsutoshi Setou[3], Hiroshi Suzuki[4], Takayuki Nishizaka[5] ([1]*Dept. Appl. Biol. Sci., Tokyo Univ. of Science*, [2]*PRESTO, JST*, [3]*Dept. Cell Biol. and Anat., Hamamatsu Univ. Sch. Med.*, [4]*Dept. Biochemistry, Asahikawa Medical Univ.*, [5]*Dept. Physics, Gakushuin Univ.*)

2SDA-06　骨格筋ミオシン分子複合体の力発生に特化したミオシン１分子の特性とダイナミクス
Molecular properties and dynamics of single skeletal myosins designed for force generations in ensemble of myosin molecules
○茅 元司, 樋口 秀男（東京大学 大学院理学系研究科 物理学専攻）
Motoshi Kaya, Hideo Higuchi (*University of Tokyo Dept of Physics*)

2SDA-07　分子イメージングから要素間の高次相互作用の定量化に向けて
Toward quantifying higher-order interactions among elements from molecular imaging
○小松崎 民樹[1,2,3]（[1]北海道大学電子科学研究所, [2]北海道大学生命科学院, [3]北海道大学数学連携推進センター）
Tamiki Komatsuzaki[1,2,3] ([1]*Research Institute for Electronic Science, Hokkaido University*, [2]*Graduate School of Life Science, Hokkaido University*, [3]*Research Center for Integrative Mathematics*)

8:45～11:15　E 会場／Room E：Kyoto Int'l Conf. Center Room E

2SEA　新学術領域「細胞シグナリング複合体によるシグナル検知・伝達・応答の構造的基礎」共催
構造細胞生物学の生物物理学的こころ
Biophysical views in structural cell biology

オーガナイザー：箱嶋 敏雄（奈良先端科学技術大学院大学），深井 周也（東京大学）
Organizer: Toshio Hakoshima (NAIST), Shuya Fukai (The Univ. of Tokyo)

Recent advances in studies of cell-cell junctions and cell-matrix adhesions reveal that these junctions and adhesions play a role in mechano-sensing of applied forces and transduce the forces to chemical signals. Mechanotransduction by proteins comprising these contacts is now believed to control cell growth, division, motility and ultimately morphogenesis of tissues and organs. Mechanical and structural studies of these sensor proteins and mathematical description of cell mass have come on the stage center of the new era of cell biology.

はじめに
○箱嶋 敏雄（奈良先端大学院・構造生物学バイオサイエンス研究科）
Toshio Hakoshima (*Nara Institute of Science and Technology*)

2SEA-01　アドヘレンスジャンクションにおける張力感受性と上皮形態形成
Force sensitivity of the adherens junction and epithelial morphogenesis
○米村 重信（理化学研究所発生・再生科学総合研究センター電子顕微鏡解析室）
Shigenobu Yonemura (*Electron Microscope Laboratory, Riken Center for Developmental Biology*)

2SEA-02　構造細胞生物学の生物物理学的こころ
Biophysical views in structural cell biology
○箱嶋 敏雄（奈良先端大学院・構造生物学バイオサイエンス研究科）
Toshio Hakoshima (*Nara Institute of Science and Technology*)

2SEA-03　AFM を用いた接着結合分子の力学挙動解析
Mechanical Evaluation of Molecules at Adherens Junction using AFM
○韓 成雄[1], 牧 功一郎[1], 平野 良憲[2], 箱嶋 敏雄[2], 安達 泰治[1]（[1]京都大学, [2]奈良先端科学技術大学院大学）
Sung-Woong Han[1], Koichiro Maki[1], Yoshinori Hirano[2], Toshio Hakoshima[2], Taiji Adachi[1] ([1]*Kyoto University*, [2]*Nara Institute of Science and Technology*)

2SEA-04　Computational biophysics on epithelial tissue deformation: from molecular to tissue scale
Yasuhiro Inoue[1], Satoru Okuda[2], Tetsuya Fujii[3], Kohei Ohto[3], Taiji Adachi[1] ([1]*Inst. Front. Med. Sci., Kyoto Univ.*, [2]*CDB, RIKEN*, [3]*Dept. Microeng., Kyoto Univ.*)

2SEA-05　軸索伸長のためのシグナル－力変換機構
Signal-Force Transduction in Axon Outgrowth
○稲垣 直之（奈良先端大・バイオ）
Naoyuki Inagaki (*Grad. Sch. Bio., NAIST*)

2SEA-06　構造生物学からのコメント
Comments from the point of view of structural biology
○深井 周也[1,2,3]（[1]東京大学放射光連携研究機構生命科学部門, [2]東京大学分子細胞生物学研究所, [3]JST CREST）
Shuya Fukai[1,2,3] ([1]*Synchrotron Radiation Research Organization, The University of Tokyo*, [2]*Institute of Molecular and Cellular Biosciences, The University of Tokyo*, [3]*JST CREST*)

16:15～18:45　A 会場／Room A：Kyoto Int'l Conf. Center Room B-2

2SAP　ロドプシン研究の過去・現在・未来
Rhodopsin Research: Past, Present and Future

オーガナイザー：神取 秀樹（名古屋工業大学），寺北 明久（大阪市立大学）
Organizer: Hideki Kandori (Nagoya Inst.of Tech.), Akihisa Terakita (Osaka City Univ.)

Rhodopsin research is one of the main topics in biophysics (photobiology field), to which Japan has significantly contributed. Currently, activation mechanism of G protein-coupled receptors and optogenetic application have been attracting attentions for life scientists. In this symposium, we look back on the history of rhodopsin research, and discuss on the future outlook. For this aim, senior researchers give a talk and young scientists chair the presentations, by which we like to debate on what can be learned from rhodopsin research, and what is the future. Active discussion is very welcome.

2SAP-01　ロドプシン研究の新しい流れ
New trends in rhodopsin studies
○七田 芳則（京都大学大学院理学研究科生物科学専攻生物物理学教室）
Yoshinori Shichida (*Department of Biophysics, Graduate School of Science, Kyoto University*)

2SAP-02　ロドプシン群蛋白質の光誘起構造変化に関する X 線結晶解析
X-ray crystallographic studies on light-induced structural changes in rhodopsins
○神山 勉（名古屋大学理学研究科）
Tsutomu Kouyama (*Nagoya University, Graduate School of Science*)

2SAP-03　退色しないロドプシンから体色などを制御する非視覚性オプシンへ
From non-bleachable rhodopsin to non-visual opsins
○深田 吉孝（東京大学大学院理学系研究科生物化学専攻）
Yoshitaka Fukada (*Dept. Biophys. Biochem., Grad. Sch. Sci., Univ. Tokyo*)

2SAP-04　錐体 AL-OL 反応の基質特異性と活性の細胞内局在
Substrate Specificity and Localization of AL-OL Coupling Reaction in Carp Cones
佐藤 慎哉[1], 橘木 修志[1,2], 深川 貴志[2], ○河村 悟[1,2]（[1]大阪大学大学院理学研究科生物科学科, [2]大阪大学大学院生命機能研究科）
Shinya Sato[1], Shuji Tachibanaki[1,2], Takashi Fukagawa[2], **Satoru Kawamura**[1,2] ([1]*Department of Biological Sciences, Graduate School of Science, Osaka University*, [2]*Graduate School of Frontier Biosciences, Osaka University*)

16:15～18:45　B 会場／Room B：Kyoto Int'l Conf. Center Room B-1

2SBP　新学術領域「過渡的複合体が関わる生命現象の統合的理解」共催
過渡的複合体が関わる生命現象の統合的理解
Transient macromolecular complexes involved in multilevel biological phenomena

オーガナイザー：嶋田 一夫（東京大学），神田 大輔（九州大学）
Organizer: Ichio Shimada (The Univ. of Tokyo), Daisuke Kohda (Kyushu Univ.)

A view of “transient macromolecular complexes” is now widely recognized as one of the important concepts in multi level biological phenomena. Existing techniques of structural biology are not directly applicable due to the intrinsic instability and inhomogeneity of such transient complexes. We have conducted studies on new techniques for analyzing transient macromolecular complexes at atomic and molecular levels in a 5-year project for Grant-in-Aid for Scientific Research on Innovative Areas. We will discuss the potentiality of the new techniques in the filed of biophysics.

2SBP-01　メチル化 CpG 結合蛋白質 MBD4 による緩い基質 DNA 認識
Structural insight into versatile DNA recognition of methyl CpG binding protein MBD4
○有吉 眞理子[1], 大谷 淳二[2], 白川 昌宏[2]（[1]京大・iCeMS, [2]京大院・工）
Mariko Ariyoshi[1], Jyunji Otani[2], Masahiro Shirakawa[2] ([1]*iCeMS, Kyoto Univ.*, [2]*Grad. Sch. Eng., Kyoto Univ.*)

2SBP-02 タンパク質結晶中に意図的に創り出した空間を使って，タンパク質に結合した状態のリガンドの大振幅運動を解析する
Intentional creation of crystal-contact free space for monitoring large amplitude motions of ligands in protein crystals
○神田 大輔（九大・生医研）
Daisuke Kohda (*Med. Inst. Bioreg., Kyushu Univ.*)

2SBP-03 ゲル包埋型バイオリアクターを用いた生細胞内蛋白質間相互作用の NMR 観測
A gel-encapsulated bioreactor system for NMR studies of protein-protein interactions in living mammalian cells
○西田 紀貴[1], 嶋田 一夫[1,2]（[1]東大院薬系, [2]産総研・創薬分子プロファイリング研究センター）
Noritaka Nishida[1], Ichio Shimada[1,2] ([1]*Grad Sch Pharma Sci, Univ of Tokyo*, [2]*Molprof, AIST*)

2SBP-04 タンパク質解析のための生細胞でのケミカルラベリング
Chemical protein labeling in living systems for its analysis
○浜地 格（京都大学）
Itaru Hamachi (*Kyoto University*)

2SBP-05 ケモカイン受容体多量体形成による細胞動態の調節
Chemokine receptor oligomerization: a potential mechanism for regulating lymphocyte and cancer cell migration
○早坂 晴子, 小林 大地, 宮坂 昌之（大阪大学医学系研究科免疫動態学）
Haruko Hayasaka, Daichi Kobayashi, Masayuki Miyasaka (*Immunodyamics, Osaka Univ. Grad. Sch. Med.*)

2SBP-06 一回膜貫通型サイトカイン受容体 Mpl 二量体化の一分子蛍光解析
Single-molecule fluorescence analysis of the single-transmembrane cytokine receptor Mpl dimerization
坂本 明彦[1], 加藤 尚志[2], ○船津 高志[1]（[1]東大・院薬, [2]早大・教育・総合科学）
Akihiko Sakamoto[1], Takashi Kato[2], **Takashi Funatsu**[1] ([1]*Grd. Sch. Pharm. Sci., Univ. Tokyo*, [2]*Fac. Ed. and Int. Arts. Sci., Waseda Univ.*)

16:15～18:45　C 会場／Room C：Kyoto Int'l Conf. Center Room C-1

2SCP　核内混み合い環境でのヌクレオソーム、クロマチンの機能発現機構
Functional dynamics of Nucleosome and Chromathin in Nuclear Crowding Environment

オーガナイザー：杉田 有治（理化学研究所），高橋 恒一（理化学研究所）
Organizer: Yuji Sugita (RIKEN), Koichi Takahashi (RIKEN)

Cellular nucleus is also a crowded environment where long DNA chains are packed with high densities. Recently, the highly packed DNA structures with DNA binding proteins have been investigated using X-ray crystallography, cryoelectron microscopy, and small-angle X-ray scattering (SAXS). These updated experimental information encourages multi-scale computational modeling of nucleosomes or chromatin fibers. In the symposium, both experimental and computational scientists show the latest data and discuss about the structures and dynamics of genomic DNA in chromosome or nucleus.

2SCP-01 ヌクレオソーム DNA 弛緩状態の自由エネルギープロファイル
Free Energy Profile for Nucleosomal DNA unwrapping
○河野 秀俊, 米谷 佳晃, 池部 仁善, 櫻庭 俊, 石田 恒（日本原子力研究開発機構量子ビーム応用研究部門分子シミュレーション）
Hidetoshi Kono, Yoshiteru Yonetani, Jinzen Ikebe, Shun Sakuraba, Hisashi Ishida (*Molecular Modeling and Simulation, JAEA*)

2SCP-02 クロマチン高次構造形成におけるヌクレオソーム構造多様性
Structural versatility of nucleosomes in higher order chromatin
○胡桃坂 仁志（早稲田大学理工学術院 先進理工学部）
Hitoshi Kurumizaka (*Waseda University, Faculty of Science and Engineering*)

2SCP-03 モデルクロマチンの構造と転写因子ダイナミクスの粗視化シミュレーション研究
Structure of model chromatin and dynamics of transcription factors studied by coarse-grained simulations
○高田 彰二（京都大学理学研究科生物物理学教室）
Shoji Takada (*Department of Biophysics, Graduate School of Science, Kyoto University*)

2SCP-04 ヌクレオソームの線維は細胞内でどのように収納されているのか？
How is nucleosome fiber organized in the cell?
○前島 一博（国立遺伝学研究所）
Kazuhiro Maeshima (*National Institute of Genetics*)

2SCP-05 Diffusion-controlled reaction rate-laws in intracellular environment with molecular crowding: A single-particle-level simulation study
Kazunari Kaizu, Koichi Takahashi (*Laboratory for Biochemical Simulation, RIKEN Quantitative Biology Center (QBiC)*)

16:15～18:45　D 会場／Room D：Kyoto Int'l Conf. Center Room D

2SDP　ASB-BSJ Bilateral Symposium 2013

Organizer: Brett Hambly (University of Sydney), Jamie Vandenberg (President ASB, Victor Chang Cardiac Research Institute), Hiroyuki Noji (The University of Tokyo), Kuniaki Nagayama (National Institute for Physiological Sciences)

The Australian Society for Biophysics requests the opportunity to conduct a bilateral symposium of ~2.5 hours duration at the Biophysical Society of Japan annual conference in October 2013. The aims and purpose of the symposium are to promote the IUPAB 2014 Congress in Brisbane in 2014 to members of the BSJ. This will be achieved by 4 senior members and one early career member of ASB presenting their research results at the Symposium, to illustrate some aspects of biophysics research in Australia. Additionally, the President of ASB will briefly outline the breadth of biophysics in Australia, and the Congress Convenor will outline the structure and program of the Congress. We appreciate the opportunity that BSJ has provided us with to forge closer links between ASB and BSJ, and to promote the IUPAB 2014 Congress.

Opening remarks - Biophysics in Australia
Jawie Vandenberg (*President ASB*)

2SDP-01 High resolution imaging of malaria parasites with light, x-rays and electrons
Leann Tilley, Coralie Millet, Eric Hanssen, Matt Dixon (*Biochemistry Department, Bio21 Institute, University of Melbourne*)

2SDP-02 The dynamics of DNA origami nanostructures in Solution
Robert Hynson[1,2], Emeline Vernhes[1], Anthony Duff[3], Cy Jeffries[4], **Lawrence Lee**[1,2] ([1]*The Victor Chang Cardiac Research Institute*, [2]*The University of New South Wales*, [3]*Australian Nuclear Science and Technology Organisation*, [4]*The European Molecular Biology Organisation*)

2SDP-03 Ion channel gating and Japanese Puzzle Boxes
Jamie Vandenberg (*Victor Chang Cardiac Research Institute*)

2SDP-04 The nature of myocardial heart failure: Are hypertrophic cardiomyopathies all the same?
Amy Li[1], Dane King[1], Martijn Bos[2], Eleanor Kable[3], Peter Macdonald[4], Filip Braet[1,3], Brett Hambly[1], Shin'ichi Ishiwata[5], Michael Ackerman[2], Murat Kekic[1], Cristobal dos Remedios[1] ([1]*Bosch Institute, University of Sydney, Sydney 2006, Australia*, [2]*Mayo Medical School, Mayo Clinic, Rochester, Minnesota, 55902, USA*, [3]*Australian Centre for Microscopy & Microanalysis, University of Sydney 2006, Australia*, [4]*Heart & Lung Transplant Unit, St. Vincent's Hospital, Darlinghurst, Sydney 2010, Australia*, [5]*Department of Physics, Faculty of Science and Engineering, Waseda University, Tokyo 169-8050, Japan*)

2SDP-05 The role of matrix metalloproteinases in genetic thoracic aortic aneurysm
Yaxin Lu[1], Richmond Jeremy[2], Murat Kekic[1], Jianlin Yin[2], Donna Lai[1], **Brett Hambly**[1] ([1]*Pathology Discipline and Bosch Institute, University of Sydney*, [2]*Royal Prince Alfred Hospital, University of Sydney*)

Information on IUPAB 2014 Brisbane
Brett Hambly (*Congress convenor*)

16:15～18:45　E 会場／Room E：Kyoto Int'l Conf. Center Room E

2SEP　新学術領域「動く細胞と場のクロストークによる秩序の生成」共催

多細胞システムにおける秩序生成の仕組みを探る：動く細胞と場のクロストーク

Exploring mechanisms of emerging order in multicellular systems: Cross-talk between moving cells and microenvironment

オーガナイザー：宮田 卓樹（名古屋大学），上田 昌宏（大阪大学）

Organizer: Takaki Miyata (Nagoya Univ.), Masahiro Ueda (Osaka Univ.)

What is the principle by which moving cells with intrinsic fluctuations can develop into an ordered functional multicellular system? How can moving cells influence their environment and how can that environment restrict the randomness and freedom of cell movements, thereby alleviating strain and disorder in tissues and leading to a conducive, robust, and harmonious state? In this symposium, we introduce experimental and theoretical approaches to higher ordered phenomenon emerged through the cross-talk between individual cells and their environments in multicellular system, and discuss the principle.

2SEP-01　神経前駆細胞の集団的核移動の原理と意義

Collective nuclear migration of neural progenitors: mechanism and significance

宮田 卓樹, ○岡本 麻友美（名古屋大学大学院医学系研究科細胞生物学分野）

Takaki Miyata, **Mayumi Okamoto** (*Nagoya Univ Grad Sch Med, Anat & Cell Biol*)

2SEP-02　細胞の自発運動と確率的センシング機構との関連性

Spontaneous cell migration and its relevance to cellular stochastic sensing mechanism

○高木 拓明（奈良県立医大 医学部 物理学教室）

Hiroaki Takagi (*Department of physics, School of medicine, Nara medical University*)

2SEP-03　LFA-1/ICAM-1 によるリンパ球の‘stop and go’：ライブイメージングによるリンパ球の動態解析

Regulation of Lymphocyte “Stop and Go” via LFA-1 and ICAM-1: Lymphocyte Trafficking Analysis using Live Imaging Techniques

○木梨 達雄, 片貝 智哉, 植田 祥啓, 近藤 直幸（関西医科大学附属生命医学研究所分子遺伝学部門）

Tatsuo Kinashi, Tomoya Katakai, Yoshihiro Ueda, Naoyuki Kondo (*Dept. Molecular Genetics, Institute of Biomedical Science, Kansai Medical University*)

2SEP-04　肺の枝分れ構造の形成機構

Mechanism of lung branching morphogenesis

○三浦 岳（九州大学）

Takashi Miura (*Kyushu University*)

2SEP-05　Analysis of Tooth Germ Epithelium Morphogenesis by using Four-dimensional Cell Tracking System

Ritsuko Morita[1,2], Takashi Tsuji[2] ([1]*RIKEN CDB*, [2]*Research Inst. Sci. & Tech., Tokyo Univ. of Sci*)

2SEP-06　細胞外マトリクスとアピカル細胞膜のカップリングが気管上皮チューブの形状を決定する

Mechanical coupling of extracellular matrix with apical membrane specifies geometry of epithelial tubule

Dong Bo[1], Hannezo Edouard[2], ○林 茂生[1]（[1]理研CDB, [2]キュリー研究所）

Bo Dong[1], Edouard Hannezo[2], **Shigeo Hayashi**[1] ([1]*RIKEN CDB*, [2]*Institut Curie*)

9:45～12:15　A 会場／Room A：Kyoto Int'l Conf. Center Room B-2

3SAA　生物物理学の近未来-バイオ・ラマン研究の効きどころ-
The Points in Bio-Raman Research

オーガナイザー：盛田 伸一（理化学研究所），石垣 美歌（関西学院大学）
Organizer: Shin-ichi Morita (RIKEN), Mika Ishigaki (Kwansei Gakuin Univ.)

Recent Raman microscopy gives opportunity to measure concentrations of chemical species within individual live cells without chemical marking. (i) A single observation in bio-Raman research requires a few minutes, which allows continuous analysis of typical cellular responses; (ii) single molecular detection is possible using signal enhancing techniques; (iii) introducing Raman tags, one can visualize small bio-molecules. Through talks in the symposium, recent killer applications of the bio-Raman research will be clarified.

はじめに
○盛田 伸一（理化学研究所）
Shin-ichi Morita (*RIKEN*)

3SAA-01　表面増強ラマン散乱の機構解明と疾病関連分子や細胞表面タンパク質分子の超高感度検出への応用
Clarification of surface enhanced Raman scattering and its application to ultrasensitive detection of biomolecules
○伊藤 民武（産業技術総合研究所）
Tamitake Itoh (*AIST*)

3SAA-02　アルキンタグを用いた低分子化合物の生細胞ラマンイメージング
Alkyne-Tag Raman Imaging for Visualization of Small Molecules in Live Cells
○袖岡 幹子[1,2]（[1]理化学研究所, [2]ERATO, JST）
Mikiko Sodeoka[1,2] ([1]*RIKEN*, [2]*ERATO, JST*)

3SAA-03　ラマン散乱分光顕微鏡を用いた細胞状態を定義する「細胞指紋」の提案
Cellular fingerprints to distinguish and identify the various cellular states with Raman spectroscopy
○渡邉 朋信[1,2,3,4]（[1](独)理化学研究所生命システム研究センター, [2]大阪大学免疫学フロンティア研究センター, [3]大阪大学大学院生命機能研究科, [4](独)科学技術振興機構さきがけ）
Tomonobu Watanabe[1,2,3,4] ([1]*RIKEN, Quantitative Biology Center*, [2]*Immunology Frontier Research Center, Osaka University*, [3]*Graduate School of Frontier Bioscience, Osaka University*, [4]*PRESTO, Japan Science and Technology Agency*)

3SAA-04　ラマン分光イメージングが拓く新たな細胞周期ダイナミクス研究の可能性
In Vivo Raman Spectral Imaging of Cell Cycle Dynamics: Adding a New Dimension to Cell Cycle Research
黄 傳耿, 許 仁芳, ○重藤 真介（国立交通大・応化）
Chuan-Keng Huang, Jen-Fang Hsu, **Shinsuke Shigeto** (*Dept. Appl. Chem., National Chiao Tung Univ.*)

3SAA-05　スペクトル解析によるバイオ･ラマン研究
Spectral Analysis for Bio-Raman Research
○盛田 伸一（(独）理化学研究所 佐甲細胞情報研究室）
Shin-ichi Morita (*Cellular Informatics Laboratory, RIKEN*)

おわりに
○伊藤 民武（産業技術総合研究所）
Tamitake Itoh (*AIST*)

9:45～12:15　B 会場／Room B：Kyoto Int'l Conf. Center Room B-1

3SBA　光学イメージングによる脳神経研究の最前線―1 分子から in vivo まで―
Cutting-edge optical imaging approach to neuroscience -From single molecule to in vivo-

オーガナイザー：王 丹（京都大学），坂内 博子（名古屋大学）
Organizer: Dan Ohtan Wang (Kyoto Univ.), Hiroko Bannai (Nagoya Univ.)

Optical imaging provides a powerful approach to neuroscience - a rapidly evolving discipline filled with many fundamental unanswered questions. In this symposium, we aim to further the integration of cutting-edge optical imaging developed in the field of biophysics with brain science, one of the most important and challenging topics of this century. Seven leading neuroscience researchers will introduce their recent studies, taking advantage of various imaging techniques ranging from single molecule imaging to in vivo imaging and the development of novel technologies promoting future brain sciences.

3SBA-01　抑制性 GABA 作動性シナプス制御におけるカルシウムの驚くべき作用―1 分子イメージングで明らかになったこと―
Origin-dependent opposite effect of Ca^{2+} on the regulation of inhibitory $GABA_A$ receptor diffusion dynamics: a single molecule study
○坂内 博子[1,2], 丹羽 史尋[2], Triller Antoine[3], 御子柴 克彦[2] ([1]名大・院理・生命理学, [2]理研・脳センター, [3]IBENS, INSERM U1024, CNRS UMR8197）
Hiroko Bannai[1,2], Fumihiro Niwa[2], Antoine Triller[3], Katsuhiko Mikoshiba[2] ([1]*Nagoya Univ., Grad. Sch. Sci, Dept. Biol. Sci.*, [2]*RIKEN BSI*, [3]*IBENS, INSERM U1024, CNRS UMR8197*)

3SBA-02　シナプス内シグナル分子活性化のイメージングと操作
Imaging and controlling the activity of signaling molecules in dendritic spines of hippocampal neurons
○村越 秀治[1,2]（[1]自然科学研究機構生理学研究所, [2]科学技術振興機構さきがけ）
Hideji Murakoshi[1,2] ([1]*National Institute for Physiological Sciences*, [2]*PRESTO, JST*)

3SBA-03　Imaging with novel photochemical materials to study neuronal functions
Dan O Wang (*institute for integrated cell-material sciences*)

3SBA-04　STED imaging of synapses in living brain slices: from structure to function
U. Valentin Nägerl[1,2] ([1]*IINS, Univ. Bordeaux Segalen, France*, [2]*UMR 5297, CNRS, Bordeaux, France*)

3SBA-05　新規レーザー光技術による２光子顕微鏡の空間分解能、深部到達性の向上
Improvement of Reolution and Penetration Depth of Two-photon Microscopy with Novel Laser Techniques
○根本 知己（北海道大学電子科学研究所）
Tomomi Nemoto (*RIES, Hokkaido Univ.*)

3SBA-06　FRET sensing of transmembrane voltage
Hidekazu Tsutsui (*Osaka University*)

3SBA-07　グリアによる大脳皮質シナプス再編
Glial contribution to remodeling of cortical synapses
○鍋倉 淳一[1,2]（[1]生理研, [2]総研大）
Junichi Nabekura[1,2] ([1]*NIPS*, [2]*SOKENDAI*)

9:45～12:15　C 会場／Room C：Kyoto Int'l Conf. Center Room C-1

3SCA　生命現象の理解と核酸医薬を指向した機能性核酸の研究の最前線
Frontier of functional nucleic acids toward elucidation of biological events and nucleic acid medicine

オーガナイザー：片平 正人（京都大学），鳥越 秀峰（東京理科大学）
Organizer: Masato Katahira (Kyoto Univ.), Hidetaka Torigoe (Tokyo Univ. of Sci.)

Nucleic acids carry genetic information. This is, however, not all that nucleic acids can do. Other functions of nucleic acids have been emerging. DNA origami can be used as a molecular canvas to study various events of life science. A Microchip device with nucleic acids has been invented. Artificial base pairs have also been successfully developed. RNA aptamer can trap and inactivate a pathogenic protein. Pharmaceutical companies are pursuing to develop a next generation of drug with nucleic acids, nucleic acids medicine. Frontier of functional nucleic acids will be presented.

3SCA-01　DNA の構造と機能を制御するケミカルバイオロジー：DNA オリガミと人工遺伝子スイッチ
Chemical Biology that Controls DNA Structure and Function: DNA Origami and Artificial Genetic Switch
○杉山 弘[1,2]（[1]京都大学大学院理学研究科、, [2]物質―細胞統合システム拠点）
Hiroshi Sugiyama[1,2] ([1]*Department of Chemistry, Graduate School of Science, Kyoto University*, [2]*Institute for Integrated Cell-Material Sciences (iCeMS)*)

3SCA-02　抗プリオン活性を示すアプタマー及びカリウムイオンに感応して活性がスイッチングするインテリジェントリボザイム
Aptamer that exerts anti-prion activity and intelligent ribozyme whose activity switches in response to K^+
○片平 正人[1], 真嶋 司[1], 山置 佑大[1], 永田 崇[1], 西川 富美子[2], 西川 諭[2], 鎌足 雄司[3], 桑田 一夫[3]（[1]京都大学エネルギー理工学研究所, [2]産総研, [3]岐阜大）
Masato Katahira[1], Tsukasa Mashima[1], Yuudai Yamaoki[1], Takashi Nagata[1], Fumiko Nishikawa[2], Satoshi Nishikawa[2], Yuji Kamatari[3], Kazuo Kuwata[3] ([1]*Inst. of Adv. Energy, Kyoto Univ.*, [2]*AIST*, [3]*Gifu Univ.*)

3SCA-03　High-affinity DNA aptamer selection by a genetic alphabet expansion PCR system
Michiko Kimoto[1,2], Ken-ichiro Matsunaga[1], Rie Yamashige[1], Ichiro Hirao[1,2] ([1]*RIKEN CLST*, [2]*TagCyx Biotechnologies*)

3SCA-04　核酸医薬品への期待
The prospect for nucleic acid medicine
○坂田 恒昭[1,2]（[1]塩野義製薬（株）, [2]大阪大学大学院基礎工学研究科）
Tsuneaki Sakata[1,2] ([1]*Shionogi & Co., Ltd.*, [2]*Graduate School of Engineering Science, Osaka University*)

3SCA-05　熱力学的特性や速度論的特性に基づいた機能性核酸のデザイン戦略
Strategy to design functional nucleic acids based on their thermodynamic and kinetic properties
○鳥越 秀峰（東京理科大学理学部第一部応用化学科）
Hidetaka Torigoe (*Dep. Appl. Chem., Fac. Sci., Tokyo Univ. Sci.*)

3SCA-06　生命現象の理解に向けた超高速 DNA 分離と一分子 DNA メチル化検出のためのナノバイオデバイス
Nanobiodevices for ultrafast DNA separation and single molecular DNA methylation detection for the understanding of life phenomena
○湯川 博[1], 馬場 嘉信[1,2]（[1]名大 革新ナノバイオ研セ, [2]名大院工）
Hiroshi Yukawa[1], Yoshinobu Baba[1,2] ([1]*Res. Cent. Inno. Nanobio., Univ. Nagoya*, [2]*Grad. Sch. Eng., Univ. Nagoya*)

3SCA-07　RNA アプタマー医薬の開発動向
Development trends for RNA aptamer therapeutics
○宮川 伸（株式会社リボミック）
Shin Miyakawa (*RIBOMIC Inc.*)

9:45～12:15　D 会場／Room D：Kyoto Int'l Conf. Center Room D

3SDA　新学術領域「ナノメディシン分子科学」共催
個体の生物物理学ー分子・細胞・個体にブリッジー
Biophysics toward *In Vivo* work

オーガナイザー：樋口 秀男（東京大学），福田 紀男（慈恵会医科大学）
Organizer: Hideo Higuchi (The Univ. of Tokyo), Norio Fukuda (The Jikei Univ. Sch. of Med.)

One of the final goals of biophysics is to understand the in vivo functions of molecules including proteins, DNA and RNA. Physiological conditions in vivo are very different from those in experiments with purified proteins and in cultured cells. Therefore, in order to elucidate various processes in living systems at the molecular level, it is crucial to measure the functions of proteins in vivo. In this symposium, we will present excellent findings in mice and C. elengans eggs, and those of a heartbeat simulation study.

3SDA-01　動物の発生における PAR/aPKC 細胞極性システムの計測に基づいた数理モデル化
Measurement-based mathematical modeling of PAR/aPKC-dependent cell polarization in animal development
○荒田 幸信[1], 廣島 通夫[1,2], 白 燦基[1], 小林 徹也[3], 柴田 達夫[4], 佐甲 靖志[1]（[1]理研・佐甲細胞情報, [2]理研・生命システム・細胞シグナル動態, [3]東大・生産研・定量生物学, [4]理研・発生再生・フィジカルバイオロジー）
Yukinobu Arata[1], Michio Hiroshima[1,2], Chan-gi Pack[1], Tetsuya J. Kobayashi[3], Tatsuo Shibata[4], Yasushi Sako[1] ([1]*Cell. Info. Lab., Riken*, [2]*Lab. Cell Sig. Dyn., QBiC, Riken*, [3]*Inst. Indst. Sci., Univ. Tokyo*, [4]*Lab. Phy. Biol., CDB, Riken*)

3SDA-02　気管繊毛の運動と 3 次元構造解析
Ciliary motion and the three-dimensional structure in mouse respiratory cilia
○上野 裕則（愛教大 分子・生命）
Hironori Ueno (*Mol. func. and life sci., Aichi Univ. of Edu.*)

3SDA-03　非侵襲 in vivo 技術を用いたマウス内の好中球における高速小胞輸送解析
A non-invasive technique for the in vivo tracking of high-speed vesicle transport in mouse neutrophils
○菊島 健児, 喜多 清, 樋口 秀男（東大・院・理・物理）
Kenji Kikushima, Sayaka Kita, Hideo Higuchi (*Dept. Physics, Grad. Sch. Sci., Univ of Tokyo*)

3SDA-04　Real-time high-resolution cardiac imaging *in vivo*
Fuyu Kobirumaki-Shimozawa[1], Kotaro Oyama[2], Seine A. Shintani[2], Erisa Hirokawa[3], Togo Shimozawa[4], Takako Terui[5], Shin'ich Ishiwata[2], Norio Fukuda[1] ([1]*Dept. Cell physiol., Jieki Univ. Sch. Med.*, [2]*Dept. Physics, Waseda Univ.*, [3]*Jieki Univ. Sch. Med.*, [4]*Dept. Physics, Gakushuin Univ.*, [5]*Dept. Anesthes., Jieki Univ. Sch. Med.*)

3SDA-05　筋収縮の数理モデルとその心臓シミュレーションへの応用について
A numerical model of cross-bridge cycling and its application to a beating human heart
○鷲尾 巧[1], 米田 一徳[2], 高橋 彰仁[1], 杉浦 清了[1], 久田 俊明[1]（[1]東京大学 新領域, [2]富士通(株)）
Takumi Washio[1], Kazunori Yoneda[2], Akihito Takahashi[1], Seiryo Sugiura[1], Toshiaki Hisada[1] ([1]*Grad. Sch. of Fron. Sci., University of Tokyo,*, [2]*Fujitsu Ltd.*)

9:45～12:15　E 会場／Room E：Kyoto Int'l Conf. Center Room E

3SEA　アミロイド線維形成における膜界面の役割
Roles of Membrane Interface in amyloidogenesis

オーガナイザー：松崎 勝巳（京都大学），矢木-内海 真穂（ケンブリッジ大学）
Organizer: Katsumi Matsuzaki (Kyoto Univ.), Maho Yagi-Utsumi (Univ. of Cambridge)

Amyloidogenesis by proteins is involved in various diseases including neurodegenerative ones. Accumulating evidence suggests that membranes play a pivotal role in amyloidogenesis in vivo. Notably, membranes not only locally concentrate proteins but also lead to the formation of amyloid fibrils with different structures and toxicity from those formed in solution. This symposium will introduce recent advances in this research field and discuss roles of membrane interface in amyloidogenesis from various points of view.

3SEA-01 ガングリオシドクラスターを介したアルツハイマーアミロイド β タンパク質のフォールディングと凝集
Ganglioside Cluster-Mediated Folding and Aggregation of Alzheimer’s Amyloid beta-Protein
○松崎 勝巳（京大・院薬学）
Katsumi Matsuzaki (*Grad. Sch. Pharm. Sci., Kyoto Univ.*)

3SEA-02 ガングリオシドとの特異的な相互作用に伴うアミロイド関連タンパク質の構造転移の NMR 解析
NMR characterization of conformational transitions of amyloidogenic proteins upon their specific interactions with gangliosides
○矢木-内海 真穂（ケンブリッジ大）
Maho Yagi-Utsumi (*Univ. Cambridge*)

3SEA-03 アミロイドタンパク質の凝集過程のシミュレーション解析
Computational study on the aggregation and assemble process of amyoid beta proteins
○星野 忠次（千葉大学大学院薬学研究院）
Tyuji Hoshino (*Graduate School of Pharmaceutical Sciences, Chiba University*)

3SEA-04 脂質膜の物理的性質とアミロイド線維形成の関係
Relationship between physical properties of lipid membranes and amyloidogenesis
○三浦 隆史, 鈴木 麻紗子（東北大・院薬）
Takashi Miura, Masako Suzuki (*Grad. Sch. Pharm. Sci., Tohoku Univ.*)

3SEA-05 アミロイド形成型免疫グロブリン軽鎖可変ドメインの細胞毒性
Toward understanding the mechanism of cytotoxicity of amyloidogenic variable domain of immunoglobulin light chains
○浜田 大三（神戸大学大学院 医学研究科 生化学・分子生物学講座 構造生物学分野）
Daizo Hamada (*Division of Structural Biology, Department of Biochemistry and Molecular Biology, Graduate School of Medicine, Kobe University*)

3SEA-06 固体 NMR と TEM によるヒトカルシトニンとグルカゴンにおけるアミロイド線維形成と阻害機構の解明
Mechanisms of amyloid fibril formation and inhibition of human calcitonin and glucagon as revealed by solid-state NMR and TEM
○内藤 晶（横浜国立大学）
Akira Naito (*Yokohama National University*)