

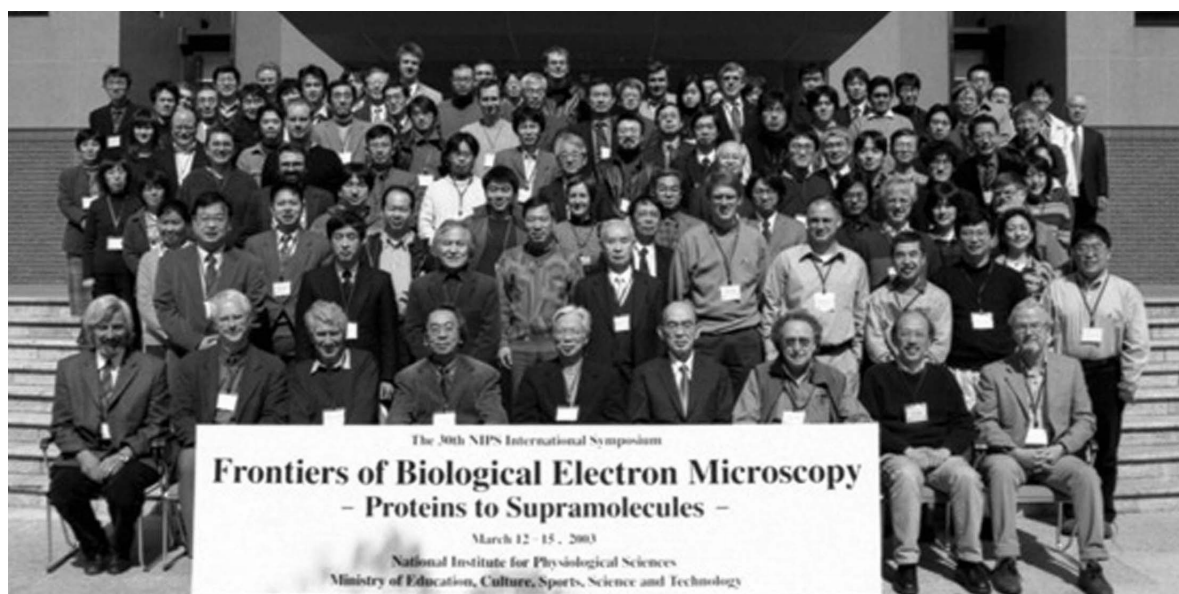
【 国際シンポジウム 】

COE 国際シンポジウム (第 30 回生理研国際シンポジウム)

本シンポジウム (“Frontiers of Biological Electron Microscopy-Proteins to Supramolecules”) は、医学部主導のミクロ解剖学、組織化学と理学部主導の高分解能電顕、電子線結晶学を融合することを目的とし、永山國昭 [超微小形態生理研究部門教授] を組織委員長として平成 15 年 3 月 12～15 日の 4 日間、岡崎コンファレンスセンターで開催された。

海外 24 名、国内から 16 名の計 40 名による招待講演と国内外からの約 40 題のポスター発表が行われ、参加者延べ 180 人による 4 日間の活発な議論が展開された。

今回のシンポジウムの成果を要約すれば以下になる。i) 形態学としての生物電子顕微鏡のフロンティアは、細胞丸ごとの超微小構造を立体的に見る低温トモグラフィーにある。ii) 光学顕微鏡と電子顕微鏡の協調利用は生物機能の研究に重要な局面を開く。iii) 電子位相顕微鏡は次代の生物用電顕として有用である。海外から数多くの一級の電顕学者を迎えることができ、学問的に大きな成果が得られるとともに多数参加した国内若手研究者に大きな刺激を与えることができた。ここから新しい共同研究、特にミクロ解剖学と高分解能電顕の新しい融合のスタートを期待したい。



Wednesday, March 12, 2003

Opening Remarks & Welcome Address

Hybrid Methods I - Prion Structures (Discussion Leader: K. Kuwata)

1. T. L. James (Univ. of California)
Prion Protein Structure and Conformational Heterogeneity: Implications for Disease.
2. H. Wille (Univ. of California)
Electron Crystallographic Analyses on Two-Dimensional Crystals of the Scrapie Prion Protein.
3. K. Akasaka (Kinki Univ.)
Expanding Protein Structure World by High Pressure NMR. Characterization of Reactive Conformers of the Prion Protein.

Hybrid Methods II - Amyloid Structures (DL: Y. Goto)

4. H. Yamaguchi (Gunma Univ.)
Ultrastructural Analysis of the Cerebral Beta Amyloid Deposition
5. H. Tachibana (Kobe Univ.)

Pressure Dissociates Amyloid-Fibrillogenic Assembly of Disulfide-Deficient Lysozyme Variant

6. H. Arai (Tohoku Univ.)

Perspectives in Alzheimer's Disease Diagnosis

Plenary Talk by N. Hirokawa (Univ. of Tokyo) (DL: K. Nagayama)

Molecular Motor, Kinesin Superfamily Proteins (KIFs) : Structure, Dynamics and Functions.

Thursday, March 13, 2003

TEM Technology I - Electron-Phase Microscopy (DL: M. Tanaka)

7. K. A. Nugent (Univ. of Melbourne)

Non-Interferometric Phase Recovery for Transmission Electron Microscopy

8. K. Nagayama (CIBS, ONRI)

Image Enhancement with Phase Plates in Electron-Phase Microscopy.

9. F. Hosokawa (JEOL)

New Phase Plate System Applied to the 120kV TEM

TEM Technology II - Cs Correction (DL: N. Tanaka)

10. M. Haider (CEOS GmbH)

Advantages of Cs-Correction for TEM and STEM for biological structure research

11. Y. Takai (Osaka Univ.)

Real-time Phase Transmission Electron Microscopy.

12. R. Danev (CIBS, ONRI)

Cs-Correction with Complex Observation in TEM.

Cell Structures I - Organelles (DL: Y. Fujiki)

13. W. Baumeister (Max Planck Inst.)

Electron Tomography: Towards Visualizing Supramolecular Architecture Inside Cells.

14. M. Marko (Wadsworth Center)

Electron Tomography of Cell Organelles: A Comparison of Cryo Techniques for 3-D Correlative Elemental Microanalysis.

15. B. J. Marsh (Univ. of Colorado)

3D Structure Studies of the Pancreatic Beta Cell by High Resolution EM Tomography.

Cell Structures II - Cytoskeletons (DL: N. Hirokawa)

16. K. H. Downing (Lawrence Berkeley Lab.)

Tubulin Structure and the Interactions that Regulate Microtubule Dynamics

17. S. Burgess (Univ. of Leeds)

Dynein Structure and Power Stroke

18. M. K. Reedy (Duke Univ.)

X-ray Diffraction of Insect Flight Muscle as a Guide to Optimizing Freeze-Substitution and Thin-Section EM Tomography

Plenary Talk by J. Heuser (Washington Univ.) (DL: K. Hama)

The Elusive Goals of Current Electron Microscopy

Friday, March 14, 2003

Cell Structures III - Muscles (DL: R. Schroeder)

19. D. Hanein (Burnham Inst.)

Deciphering the Structure of Biological Machines at the Leading Edge of Motile Cells

20. K. C. Holmes (Max Planck Inst.)

High Resolution Cryo-Electron Microscopy of "Decorated Actin" Reveals How the ATP and Actin Binding Sites of Myosin are Linked.

21. R. Craig (Univ. of Massachusetts)

Molecular Switching in Muscle

22. E. Katayama (Univ. of Tokyo)

Three-Dimensional Analyses of Free and Actin-Associated Myosin Heads in Function

Cell Structures IV - Cell Membranes (DL: T. Fujimoto)

23. M. Kuehnel (Eur. Mol. Biol. Lab.)

Manipulation of Signalling Networks Regulating Actin Nucleation Arrests Pathogen Growth.

24. J. E. Rash (Colorado State Univ.)

Freeze-Fracture Replica Immunogold-Labeling (Fril) of Membrane Proteins in Identified Neurons and Glia in Developing and Adult Vertebrate Central Nervous Systems: Connexins, Glutamate Receptors and Aquaporins

25. K. Fujimoto (Fukui Prefectural Univ.)

Dynamics of Cell Membrane Proteins and Lipids as Revealed by Freeze-Fracture Replica Labeling Electron Microscopy.

Supramolecular Structures I - Virus et al. (DL: K. Mitsuoka)

26. W. Chiu (Baylor College of Med.)

Electron Cryomicroscopy of Virus Particles at Sub-Nanometer Resolution.

27. T. Ishikawa (NIAM (NIH))

Clp Protein-degradation Machines: Mechanisms of ATP-dependent Proteolysis Revealed by Cryo-electron Microscopy and Single Particle Analysis.

Supramolecular Structures II - Flagella et al. (DL: K. Hirose)

28. A. Ishijima (Nagoya Univ.)

Torque-Speed Relationship of the Na⁺-Driven Flagellar Motor.

29. K. Yonekura (Osaka Univ.)

Electron Cryomicroscopy of Bacterial Flagellar Structures.

Plenary Talk by K. Namba (Osaka Univ., ERATO) (DL: K. Nagayama)

Switching and self-assembly of the bacterial flagellum.

Saturday, March 15, 2003

Hybrid Methods IV - Light and Electron Microscopy (DL: N. Usuda)

30. M. H. Ellisman (Natl. Cent. Microsc. Imag. Res.)

Correlated Multi-scale Microscopy of the Nervous System.

31. K. Shinoda (Yamaguchi Univ.)

Correlated Light and Electron Microscopy for Immunohistochemistry and *in situ* Hybridization ; with Special Reference to Structure and Function of the Stigmoid Body.

32. R. Shigemoto (Natl. Inst. Physiol. Sci.)

Number and Density of AMPA-Type Glutamate Receptors in Synaptic Sites: Corresponding Studies of Electrophysiology and Freeze-Fracture Replica Labelling.

Hybrid Methods III - Supramolecular Dynamics (DL: N. Baba)

33. C. L. Brooks III (Scripps Res. Inst.)

Exploring Ribosome Motion During Translocation Using Elastic Network Models and Normal Modes"

34. W. Wriggers (Scripps Res. Inst.)

Reconciling Shape With Structure: Strategies for Multi-Resolution Flexing of Biophysical Data.

Plenary Talk by S. Tsukita (Kyoto Univ.) (DL: K. Nagayama)

35. The Claudin Family: A Key Player in the Barrier Function of Epithelium/Endothelium in Multicellular Organisms.

Closing Remarks

Poster Sssion 12-13 March, 2003

P-1. Haruyasu Yamaguchi (Gunma University)

Ultrastructural analysis of the cerebral beta amyloid deposition

P-2. Chyongere Hsieh (Wadsworth Center)

- Electron tomography of frozen-hydrated tissue sections
- P-3. Kazuo Kuwata (Gifu University)
Structure based drug design for prion diseases.
- P-4. Norio Baba (Kogakuin University)
A new approach to complement the data in the missing range for more complete 3-D electron tomography: pre-reconstruction of a constraint boundary region based on topography measurements.
- P-5. Aiko Kishimoto (Tokyo Institute of Technology)
Structural analysis of yeast prion Sup35-fibers.
- P-6. Brad J. Marsh (University of Colorado at Boulder)
3D structure studies of the pancreatic beta cell by high resolution EM tomography.
- P-7. Yasuhiro Matsunaga (Kobe University)
Protein folding dynamics - abnormal diffusion and hierarchical regularity.
- P-8. Michael Marko (Wadsworth Center)
Electron tomography of cell organelles: a comparison of cryo techniques correlative microanalysis.
- P-9. Akio Kitao (Japan Atomic Energy Research Institute)
Molecular dynamics simulation of biological supramolecules.
- P-10. Hirofumi Suzuki (ERATO)
Structure analyses of basal components of bacterial flagellum by electron microscopy.
- P-11. Kyoko Hoshino (Kobe University)
Non-stationarity and non-Markovianity of foldings in small proteins.
- P-12. Hideyuki Matsunami (Osaka university, ERATO)
Self-assembly of flagellar hook capping protein FlgD.
- P-13. Ryo Akiyama (Cornell University)
Structure and dynamics of the A substates of MbCO: molecular compared with infrared vibrational echo experiments.
- P-14. Koji Yonekura (Osaka University, ERATO)
Atomic model of the bacterial flagellar filament by electron cryomicroscopy.
- P-15. Yuji O. Kamatari (RIKEN Harima Institute)
Conformational fluctuations of hen lysozyme investigated by high pressure NMR spectroscopy.
- P-16. Keiko Hirose (AIST)
Nucleotide-dependent structural changes of Kar3 complexed to microtubules.
- P-17. Koichi Murayama (Gifu University)
Heat-induced denaturation process of bovine serum albumin by infrared spectroscopy
- P-18. Michael K. Reedy (Duke University)
X-ray diffraction of insect flight muscle as a guide to optimizing freeze-substitution and thin-section EM tomography.
- P-19. Naomi Kamasawa (Japan Women's University)
Ultrastructure of peroxisome biogenesis in yeast.
- P-20. Roger Craig (University of Massachusetts)
Molecular switching in muscle.
- P-21. Takehiko Hida (Fujita Health University)
Immunohistochemical localization of peroxisomal fatty acid beta-oxidation enzymes in rat choroid plexus.
- P-22. Masazumi Sameshima (The Tokyo Metropolitan Institute of Medical Science)
Structure and role of novel actin rods in dormant spores of *Dictyostelium discoideum*.
- P-23. Masaki Ito (Saga Medical School)
Peroxisomal translocations and retarded maturations of 3-ketoacyl-CoA thiolase and Acyl-CoA oxidase in mammalian cells rapidly degrading Pex5p isoforms.
- P-24. Nobuhiro Morone (Nagoya University, ERATO)
Actin-based membrane skeleton structure as revealed by electron microscopic computed tomography of rapidly-frozen, deep-etched plasma membrane.

- P-25. Satoko Arakawa-Kobayashi (NIBB)
On the mode of lipid secretion in the symbiotic fungi of lichen. A quick-freezing electron microscope study.
- P-26. Yoshinobu Mineyuki (Hiroshima University)
Quantitative analysis of cytoskeletal arrays and endocytic vesicles in the cortex of dividing plant cells by dual-axis EM tomography.
- P-27. Kiyoko Uehara (Fukuoka University)
Localization of ryanodine receptor in the sinus endothelial cells of the rat spleen.
- P-28. Atsuo Miyazawa (RIKEN Harima Institute)
Structure and activation mechanism of nicotinic acetylcholine receptor.
- P-29. Toshihiko Ogura (AIST)
A novel automatic particle pickup method applicable to low-contrast electron micrographs.
- P-30. Kaoru Mitsuoka (Kyoto University)
Structural changes in bacteriorhodopsin visualized by electron crystallography.
- P-31. Tomoharu Matsumoto (CIBS, ONRI)
Purification and electron microscopic observation of membrane protein hTRPM2 (hLTPC2), derived from human cDNA and expressed in silkworm"
- P-32. Yasuko Kaneko (Saitama University)
Membrane systems of *Aldrovanda vesiculosa*, an aquatic carnivorous plant.
- P-33. Rasmus R. Schroeder (Max Plank Institute)
Enhancing contrast of weak phase objects using a zernike-type phase plate in phase contrast TEM.
- P-34. Toshitaka Akisaka (Asahi University)
Three-dimensional (3D) architecture of the inner surface of ventral membranes in cultured osteoclasts
- P-35. Nobuteru Usuda (Fujita Health University)
High contrast imaging of ice-embedded cell organelles with electron-phase microscopy.
- P-36. Gen Niimi (Fujita Health University)
Study of blood islands and erythrocyte-like globules and endodermal cells in the mouse visceral yolk sacs.
- P-37. Kuniaki Nagayama (CIBS, ONRI)
Image enhancement with phase plates in electron-phase microscopy.
- P-38. Miwako Masugi-Tokita (NIPS)
Quantitative analysis of glutamate receptors at parallel fiber-Purkinje cell synapses using SDS-FRL.
- P-39. Fumio Hosokawa (JEOL)
New phase plate system applied to the 120kV TEM.
- P-40. Tetsuji Nagata (Shinshu University)
Aging changes of macromolecular synthesis in various organs as revealed by electron microscopic radioautography.
- P-41. Radostin Danev (CIBS, ONRI)
Cs-correction with complex observation in TEM.
- P-42. Kouta Mayanagi (BERI)
Three dimensional electron microscopy of cyclic GMP phosphodiesterase 6.
- P-43. Takashi Ishikawa (NIAM (NIH))
Clp protein-degradation machines: mechanisms of ATP-dependent proteolysis revealed by cryo-electron microscopy and image analysis.