

新学術領域研究「水を主役とした ATP エネルギー変換」

前期 (2008-2010) 研究成果報告会

August 9-11, Osaka, Japan

Grant-in-Aid for Scientific Research on Innovative Area:

Hydration and ATP Energy

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Place: Hotel Osaka Garden Palace,

大阪府淀川区西宮原 1-3-35

TEL 06-6396-6211

使用言語 Language : 日本語もしくは英語 Japanese or English

Program

August 9

13:00-13:10

Opening Address –領域の目標とこれまでの進展–

Purpose of this Program and the Progress

Makoto Suzuki (Project Leader, Tohoku Univ.)

13:10 – 14:25

Extended views of hydration states of ions and ATP-related molecules

Chaired by N. Matubayasi

15 Nobuyuki Morimoto (Tohoku Univ.)

Hydration properties of oligonucleic acid analyzed by microwave dielectric spectroscopy

15 Takuya Takahashi (Ritsumeikan Univ.)

Assessment of dynamic properties of water around several solute molecules with MD simulation

15 Akifumi Ikehata (NARO, Japan)

A novel interpretation of near infrared spectra for detection of volumetric change around hydrophobic groups

15 Satoru Fujiwara (Japan Atomic Energy Agency)

Coupling of water dynamics and internal dynamics of actin detected by neutron scattering

15 Nobuo Niimura (Ibaraki Univ.)

Hydration network structure in protein-ligand interface determined by neutron diffraction.

Break 5 min

14:30 – 15:30

Thermodynamic views of ATP hydrolysis (Experimental approach)

- Chaired by T. Takahashi
- 15 Yoshihiro Sambongi (Hiroshima Univ.)
Effects of salt on ATPase activity of halophilic archaeon *Haloarcula Japonica*
- 15 Ryo Kanzaki (Kagoshima Univ.)
Thermodynamic study on ionization of nucleobases in micellar solution and ionic liquid
- 15 Michio Yamanaka (Kyushu Univ.)
Partial molar volume study of ATP hydrolysis on bovine serum albumin surface
- 15 Masayoshi Nishiyama (Kyoto Univ.)
Visualization and manipulation of intermolecular interaction by high-pressure microscopy

15:30 – 16:50

Poster Session

16:50– 18:35

Nanostructure and dynamics of ATP-driven proteins

Chaired by Y. Sambongi

- 15 Nobuhiro Morone (Kyoto Univ.)
Cellular structure-function analysis of ATP-related membrane protein
- 15 Takayuki Ariga (Tokyo Univ.)
Force generation mechanism of kinesin motor
- 15 Hiroaki Yokota (Kyoto Univ.)
Single-molecule ATPase imaging of a DNA helicase

Theoretical approach for the ATP hydrolysis reaction

Chaired by M. Kinoshita

- 15 Takeshi Yamamoto (Kyoto Univ.)
Ab initio study on the energetics of phosphate hydrolysis in water and organic solvents
- 15 Hideaki Takahashi (Tohoku Univ.)
Computation of the solvation free energies by the QM/MM-ER approach: simplification of the method and its applications
- 30 Minoru Sakurai (Tokyo Inst. Tech.)
Structural and dynamics changes of ABC transporters induced by ATP binding and its hydrolysis

August 10

9:00 – 10:30

ATP-induced structural change of proteins

Chaired by R. Akiyama

- 15 Hiroaki Kato (Kyoto Univ.)
Transmission mechanism of ATP-induced conformational changes in ABC transporter
- 15 Masahiro Ishiura (Nagoya Univ.)
ATPase activity of the cyanobacterial clock protein KaiC
- 15 Taro Uyeda (AIST)
Uni-directional cooperative conformational changes of actin filaments: possible implications in force generation by myosin

- 30 Mitsunori Takano (Waseda Univ.)
Atomic-level observation of ATP-induced allosteric responses of myosin motor domain by MD

10:15 – 11:45

Poster Session

Lunch

12:45 – 13:00

ATP-induced structural change of proteins (continued)

Chaired by M. Sakurai

- 15 Daron Standley (Osaka Univ.)
Flipping the switch on an electrostatic gatekeeper controlling nucleotide specificity in succinyl-CoA synthetase

13:00 – 15:00

Solvent and cosolvent effects on the ATP systems

- 15 Shun-ichi Kidokoro (Nagaoka Univ. Tech.)
Overall- and elementary-reaction enthalpies of ATP hydrolysis evaluated by isothermal titration calorimetry
- 15 Hideyuki Komatsu (Kyushu Inst. Tech.)
Solvent mixtures mimicking a nucleotide-binding feature of ATPase
- 15 Kuniyuki Hatori (Yamagata Univ.)
Effects of urea and guanidine hydrochloride on actomyosin functions
- 15 Mitsuhiro Iwaki (Osaka Univ.)
Actomyosin motility revealed by single-molecule Measurements
- 15 Ryo Akiyama (Kyushu Univ.)
Effective Interaction between like-charged macromolecules in an electrolyte solution and cytomotive filaments

Break 10 min.

Effects of ATP-driven proteins on the medium

Chaired by M. Iwaki

- 15 Takuo Yasunaga (Kyushu Inst. Tech.)
Approach to direct observation of environmental electrostatic fields around actin-myosin filaments in water by electron microscopy
- 30 Makoto Suzuki (Tohoku University)
Opposing hydration properties of charged and hydrophobic groups and cosolvent effects on protein hydration and functions

15:10 – 16:30

Poster Session

16:30 – 18:30

Driving force and energy balance in F1-motor

Chaired by M. Kinoshita

- 30 Eiro Muneyuki (Chuo Univ.)
Energetic balance in single molecule F1-motor
- 30 Mitsunori Ikeguchi (Yokohama City Univ.)
Theoretical study on rotational mechanism of F1 molecular motor and asymmetric structures

Theoretical progress on ATP-driven protein systems

- 30 Chaired by M. Suzuki (Tohoku Univ.)
Masahiro Kinoshita (Kyoto Univ.)
Roles of water and ATP hydrolysis in functioning of ATP-driven proteins
- 30 Nobuyuki Matubayasi (Kyoto Univ.)
All-atom analysis of solvent effect on ATP and related systems
- 18:45 –20:30** Banquet

August 11

- 8:00-9:00 Summary Meeting of FY 2008 - 2010
Makoto Suzuki (Tohoku Univ.)
-

評価委員

中村春木 (大阪大学蛋白質研究所)

永山國昭 (生理学研究所)

柳田敏雄 (大阪大学)

顧問

児玉孝雄 (大阪大学)

学術調査官

門田 功 (岡山大学)

曾和義幸 (法政大学)

総括研究班

鈴木 誠 (東北大学)

木下 正弘 (京都大学)

松林 伸幸 (京都大学)

櫻井 実 (東京工業大学)

領域代表:

鈴木 誠

東北大学大学院工学研究科

材料システム工学専攻教授

〒980-8579

宮城県仙台市青葉区荒巻字青葉 6-6-02

022-795-7303 (phone/fax)