

19-24 June 1994, Leiden, The Netherlands

Sixth International Conference on

RETINAL PROTEINS

Scientific programme

Abstracts



Stichting Chemische Congressen XI

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SCIENTIFIC PROGRAMME

Location:

Lecture Halls Centraal faciliteitengebouw

Witte-Singel/Doelen (WSD) complex

Cleveringplaats 1, Leiden

Monday, June 20

Location: Lecture Hall 011

09.00 - 10.30 Welcome and opening address

10.30 - 11.00 Coffee break

SESSION I. Identification and structure of retinal proteins

Chair: J. Findlay (Leeds)

11.00 - 11.35 Projection structures of frog rhodopsin in two crystal forms to 6Å resolution

G.F.X. Schertler (Cambridge)

11.35 - 12.10 The disulfide bond and conformational stability in bovine rhodopsin

F.F. Davidson (MIT)

12.10 - 12.45 Circadian photoreceptor proteins: a comparative analysis

R.G. Foster (UVA, Charlottesville)

12.45 - 14.00 Lunch

Location: Lecture Hall 003

Chair: R. Henderson (Cambridge)

14.30 - 15.05 Bacteriorhodopsin: the mechanism of 2D-array formation and the structure of the retinal in the protein

A. Watts (Oxford)

15.05 - 15.40 Photoaffinitylabeling of rhodopsin and bacteriorhodopsin

K. Nakanishi (Columbia, New York)

15.40 - 16.15 Phylogenetic relationship of visual pigments

F. Tokunaga (Osaka)

16.15 - 16.45 Tea break/Poster session

17.00 - 18.00 Conference reception
Burgerzaal, Town Hall

20.30 - 22.00 Poster session and drinks

Tuesday, June 21

Location: Lecture Hall 003

SESSION II: Photoreactions

Chair: P. Hargrave (U. Florida) and M. Engelhard (MPI Dortmund)

- 09.00 - 09.35 Solid state NMR studies of bacteriorhodopsin
J. Herzfeld (Brandeis)
- 09.35 - 10.10 NMR constraints on the structure of the retinal binding site in rhodopsin
S.O. Smith (Yale)
- 10.10 - 10.45 Effects of modification of the chromophore in retinochrome
K. Yoshihara (Sunbor)
- 10.45 - 11.15 Coffee break
- 11.15 - 11.50 Mechanism of the primary photoisomerization in rhodopsins
R.A. Mathies (U.C. Berkeley)
- 11.50 - 12.25 Studies of artificial bovine rhodopsin pigments derived from chromophores that bind to non-binding site lysines
M. Sheves (Weizmann)
- 12.25 - 13.00 Structure and photobleaching process of iodopsin
T. Yoshizawa (Osaka Sangyo)
- 13.00 - 14.30 Lunch
- Chair: K.P. Hofmann (Freiburg) and J. Spudich (U. Texas)*
- 14.30 - 15.05 Site-directed isotope labeling and FTIR-difference spectroscopy of bacteriorhodopsin
K.J. Rothschild (Boston)
- 15.05 - 15.40 Structural changes in the L and M intermediates of bacteriorhodopsin, analyzed by FTIR spectroscopy
E. Maeda (Kyoto)
- 15.40 - 16.15 The role of internal carboxyl groups in the activation mechanism of rhodopsin: an FTIR study on site directed rhodopsin mutants expressed in COS-cells
F. Siebert (Freiburg)
- 16.15 - 16.45 Tea break
- 16.45 - 17.20 Effect of carboxyl mutations on functional properties of bovine rhodopsin
G.L.J. DeCaluwé (Nijmegen)
- 17.20 - 17.55 Site-directed spin labeling analysis of structure and dynamics in bacteriorhodopsin
H.-J. Steinhoff (Bochum/UCLA)
- 18.00 - 20.00 Dinner
- 20.00 - 22.00 Round table discussion (Location: Lecture room 027)
Topic: The jungle of bacteriorhodopsin photointermediates
Chair: R. Mathies (U.C. Berkeley)
- 20.45 - 22.00 Round table discussion (Location: Lecture room 152)
Topic: Modeling of retinal-proteins: sense or nonsense?
Chair: J. Findlay (Leeds)

Wednesday, June 22

Location: Lecture Hall 003

SESSION III: Thermodynamics and ion transport

Chair: W. Stoeckenius (UCLA) and L. Keszthelyi (HAS, Szeged)

- 09.00 - 09.35 Structural changes and proton release in bacteriorhodopsin
M.P. Heyn (Berlin)
- 09.35 - 10.10 Anion selectivity and pumping mechanism of halorhodopsin
J. Otomo (Hitachi)
- 10.10 - 10.45 Nature of the Schiff base reprotonation switch in the bacteriorhodopsin photocycle
J.K. Lanyi (U.C. Irvine)
- 10.45 - 11.15 Coffee break
- 11.15 - 11.50 The role of H-bonded networks in bacteriorhodopsins protontransfer
K. Gerwert (Bochum)
- 11.50 - 12.25 Vectorial transport in halorhodopsin and bacteriorhodopsin
E. Bamberg (M.P.I. Frankfurt)
- 12.25 - 13.00 Three-dimensional mapping of the charge motion in bacteriorhodopsin
A. Dér (H.A.S., Szeged)
- 13.00 - 14.30 Lunch
- 14.30 - 18.00 **Excursion**
- 18.00 - 20.00 Dinner
- 20.00 - 22.00 Poster session and drinks

Thursday morning, June 23

SESSION IVa: Mechanism of signal transduction

Chair: A. Watts (Oxford) and N. Abdulaev (Shemyakin, Moscow)

Location: Lecture Hall 005

- 09.00 - 09.35 Transducer interactions and proton movements in sensory rhodopsin I
J.L. Spudich (U. Texas)
- 09.35 - 10.10 Retinal proteins from *Natronobacterium pharaonis* and *Haloarcula vallismortis*
M. Engelhard (M.P.I., Dortmund)
- 10.10 - 10.45 Signaling states of rhodopsin
K.P. Hofmann (Freiburg)
- 10.45 - 11.15 Coffee break

Location: Lecture Hall 011

- 11.15 - 11.50 Site-directed inactivation of constitutively active opsin mutants ~~X~~
D.D. Oprian (Brandeis)
- 11.50 - 12.25 Studies of the molecular mechanism of rhodopsin photoactivation
T.P. Sakmar (Rockefeller) *6TPyS in mouse R* - fluorescence*
- 12.25 - 13.00 Mechanism of rhodopsin phosphorylation
K. Palczewski (U. Washington)
Phosph. R bildet an Hepominsäure
- 13.00 - 14.30 Lunch

Oprian Lys-glu hält R_h aktiv,
Austausch von Lys oder glu hält R* immer
aktiv.

Thursday afternoon, June 23

Location: Lecture Hall 011

SESSION V: Short communications

Chair: G. Schertler (Cambridge) and A. Maeda (Kyoto)

- 14.30 - 14.45 The bR photocycle: towards a 3-D model for the M-intermediate
R. Glaeser (U.C. Berkeley), *glucose in binding*
- 14.45 - 15.00 Functional interactions in bacteriorhodopsin: a theoretical analysis of
retinal hydrogen bonding with water
M. Nina (Saclay)
- 15.00 - 15.15 Evidences for parallel photocycles in bacteriorhodopsin
M. Stockburger (M.P.I. Göttingen)
- 15.15 - 15.30 The proton released during the photocycle of bacteriorhodopsin
migrates along the surface of the purple membrane
U. Alexiev (Berlin)
- 15.30 - 15.45 M-decay in the bacteriorhodopsin photocycle: effect of cooperativity,
pH and lipophilic ions
A.D. Kaulen (Moscow)
- ~~15.45 - 16.00~~ Differences between the halide transport mechanisms of halorho-
dopsin and the acid purple form of bacteriorhodopsin analyzed with
millisecond time-resolved FTIR spectroscopy
M.S. Braiman (UVA, Charlottesville)
- 16.00 - 16.30 Tea break
- 16.30 - 16.45 Photoactive mitochondria: genetic transfer of the light-driven proton
pump bacteriorhodopsin into the inner mitochondrial membrane of
yeast.
G. Büldt (Jülich)
- 16.45 - 17.00 Bacteriorhodopsin as scaffold for membrane design
M. Pompejus (Göttingen)
- 17.00 - 17.15 Batho-rhodopsin: picosecond time-resolved coherent anti-stokes
Raman spectrum at room temperature
G.H. Atkinson (U. Arizona)
- 17.15 - 17.30 Spectroscopic studies of the activation and regeneration pathway of
squid rhodopsin
J.K. Delaney (Johns Hopkins)
- 17.30 - 17.45 *In vivo* assembly of rhodopsin-like complexes from independently
expressed protein fragments
K.D. Ridge (U. Maryland)
- 20.00 - 23.00 Conference dinner

MAS NMR Structural Characterization of Biological Assemblies

Satellite symposium Vith International Conference on Retinal Proteins
June 19-24, Leiden, The Netherlands
(Satellite chair: H.J.M. de Groot, Leiden)

Friday, June 24, 1994

PROGRAMME

Session I. Techniques. Chair: R.G. Griffin (MIT)

- 13.30 - 14.10 Recent Developments in Rotational Resonance Methodology
M.H. Levitt (Stockholm)
- 14.10 - 14.50 Deuterium Cross-Polarization Magic Angle Spinning
S. Vega (Weizmann)
- 14.50 - 15.30 Structure determination from MAS and ZAS spectra: Recent results
B. Meier (ETH Zurich)
- 15.30 - 15.45 Tea Break

Session II. Applications. Chair: H.J.M. de Groot (Leiden)

- 15.50 - 16.30 Structural Studies of Peptides and Proteins with Homonuclear
Recoupling Techniques: bR, Amylin and Amyloid.
R.G. Griffin (MIT)
- 16.30 - 17.10 Internuclear distance measurements in membranes using rotational
resonance NMR
S.O. Smith (Yale)
- 17.10 - 17.50 ^{13}C MAS NMR structure determination of uniformly labeled
Chlorophyll-a/water aggregates
G.J. Boender (Leiden)
- 18.00 - 20.00 farewell party (drinks & buffet)

