

Curriculum Vitae

Juha Matti Linnanto

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PERSONAL INFORMATION

Date and Place of Birth: 30th June 1970, Jyväskylä, Finland

Nationality: Finnish

Marital Status: married

PROFESSIONAL CAREER

Senior Research Fellow, post doc 15.05.2012 – 14.05.2014 Univ. of Tartu, Tartu, Estonia (Prof. Arvi Freiberg)

Research Assistant/Scientist 2003 – 2011 Univ. of Jyväskylä, Jyväskylä, Finland (Prof. Jouko Korppi-Tommola and Prof. Juha Knuutinen)

Free-Paid Teacher 2006 (2 months), 2008 (3 months) Univ. of Jyväskylä, Jyväskylä, Finland

Visiting Science Fellow 28.01.2003 – 19.05.2003 Univ. of Tartu, Tartu, Estonia (Prof. Arvi Freiberg)

Visiting Science Fellow 18.08.2002 – 18.12.2002 Univ. of Tartu, Tartu, Estonia (Prof. Arvi Freiberg)

Visiting Science Fellow 25.09.2001 – 20.04.2002 Univ. of Tartu, Tartu, Estonia (Prof. Arvi Freiberg)

Research Assistant 01.08.2001 – 31.08.2001 Univ. of Jyväskylä, Jyväskylä, Finland (Prof. Jouko Korppi-Tommola)

Visiting Science Fellow 15.05.2000 – 16.04.2001 Univ. of Rochester, New York, U.S.A. (Prof. Shaul Mukamel)

Research Scientist 01.01.1995 – 31.12.2000 Univ. of Jyväskylä, Jyväskylä, Finland (Prof. Jouko Korppi-Tommola)

ACADEMIC CAREER

Ph. D. 25th April 2012 Univ. of Jyväskylä, Dept. of Chemistry

M. Sc. 16th April 2008 Univ. of Jyväskylä, Dept. of Chemistry

RESEARCH INTERESTS

Surface chemistry – Adsorption of molecule on crystal and polymer surfaces; Effect of a solvent in the adsorption properties; Study of adsorption energy and interaction mechanisms.

Photosynthesis – Structures and functions of natural photosynthetic units; Structures and functions of photosynthetic light-harvesting complexes; Study of the spectroscopic and energy transfer properties of photosynthetic pigment-protein complexes.

Supramolecular Chemistry – Spatial organization of weakly coupling molecules in liquid and in solid phases; Donor-acceptor interaction mediated aggregate formation; Study of molecular self-assembly and complexation processes; Study of spectroscopic properties of molecular self-aggregates.

Quantum Chemistry and Molecular Modelling – Atomistic structure and conformation of molecule; Electronic structure of molecule; Charge-transfer states; Optically dark electronic states; Couplings between electronic and vibration states of molecule; Exciton-phonon and exciton-vibration couplings in monomers and oligomers; Temperature dependent spectroscopic processes; Time-dependent spectroscopy of molecules; Study of inter-molecular interactions; Design of molecular complexes and self-aggregates. Study of dendritic structures.

AWARDS AND HONOURS

The young researchers prize by the Finnish Chemical Society in 1998.

PUBLICATIONS

1. Jari Martiskainen, Juha Linnanto, Viivi Aumanen, Pasi Myllyperkiö, and Jouko Korppi-Tommola, 'Excitation energy transfer in isolated chlorosomes from *Chlorobaculum tepidum* and *Prosthecochloris aestuarii*', *Photochem. Photobiol.* **88** (2012) 675–683.
2. J. Linnanto, A. Freiberg, J. Korppi-Tommola, 'Quantum chemical simulations of excited state absorption spectra of photosynthetic bacterial reaction center and antenna complexes', *J. Phys. Chem. B* **115** (2011) 5536–5544.
3. Jari Martiskainen, Robertas Kananavičius, Juha Linnanto, Heli Lehtivuori, Mika Keränen, Viivi Aumanen, Nikolai Tkachenko, and Jouko Korppi-Tommola, 'Excitation energy transfer in the LHC-II trimer: from carotenoids to chlorophylls in space and time', *Photosynth. Res.* **107** (2011) 195–207.

4. Rajat K. Das, Ramesh Kandanelli, Juha Linnanto, Kunal Bose, and Uday Maitra, 'Supramolecular Chirality in Organogels: A detailed spectroscopic, morphological and rheological investigation of gels (and xerogels) derived from alkyl pyrenyl urethanes', *Langmuir*, **26** (2010) 16141–16149.
5. A. Ylikantola, J. Linnanto, J. Knuutinen, and M. Toivakka, 'Molecular modelling studies of interactions between styrene-butadiene latex and sodium polyacrylate polymer surface', *J. Mol. Struct. THEOCHEM* **953** (2010) 123–133.
6. Marie Ø. Pedersen, Juha Linnanto, Niels-Ulrik Frigaard, Niels Chr. Nielsen, and Mette Miller, 'A model of the protein-pigment baseplate complex in chlorosomes of photosynthetic green bacteria', *Photosynth. Res.* **104** (2010) 233–243.
7. Jari Martiskainen, Juha Linnanto, Robertas Kananavičius, Viivi Lehtovuori, and Jouko Korppi-Tommola, 'Excitation energy transfer in isolated chlorosomes from *Chloroflexus aurantiacus*', *Chem. Phys. Lett.* **477** (2009) 216–220.
8. Margus Rätsep, Juha Linnanto, and Arvi Freiberg, 'Mirror symmetry and vibrational structure in optical spectra of chlorophyll *a*', *J. Chem. Phys.* **130** (2009) 194501 (11 pages).
9. Laura Kela, Juha Knuutinen, Juha Linnanto, and Reijo Suontamo, 'Interactions between starch based surface treatment chemicals and a pulp fiber model surface studied by molecular modelling' The Proceedings of the Fundamental and Applied Pulp & Paper Modelling Symposium 2008, ISBN: 13978-2-9808323-5-2, Cascades Inc. (2009) 95–105.
10. J. M. Linnanto and J. E. I. Korppi-Tommola, 'Modelling excitonic energy transfer in the photosynthetic unit of purple bacteria' *Chem. Phys.* **357** (2009) 171–180.
11. Juha M. Linnanto and Jouko E. I. Korppi-Tommola, 'Investigation on chlorosomal antenna geometries: tube, lamella and spiral-type self-aggregates' *Photosynth. Res.* **96** (2008) 227–245.
12. Arno Hahma, Shreedhar Bhat, Kimmo Leivo, Juha Linnanto, Manu Lahtinen, and Kari Rissanen, 'Pyrene derived functionalized low molecular weight organic gelators and gels', *New J. Chem.* **32** (2008) 1438–1448.
13. Juha Linnanto and Jouko Korppi-Tommola, 'A theoretical model for excitation energy transfer in chlorosomes: lamellar and rod-shaped antenna structures' *Photosynthesis. Energy from the Sun – 14th International Congress on Photosynthesis*, **2007**, Springer, ISBN: 978-1-4020-6707-5, 287–290.
14. Laura Kela, Juha Knuutinen, Juha Linnanto, Reijo Suontamo, Soili Peltonen, and Kirsi Kataja, 'Interactions between cationic amylose derivatives and a pulp fiber model surface studied by molecular modelling' *J. Mol. Struct. THEOCHEM* **819** (2007) 1–12.
15. Tarmo Tamm, Juha Linnanto, Aleksandr Ellervee, and Arvi Freiberg, 'Modeling of pressure effects on absorption spectra of solvated chlorophyll and bacteriochlorophyll molecules' *Lecture Series on Computer and Computational Sciences*, **4 A** (Advances in Computational Methods in Sciences and Engineering) (2005), ISSN: 1573-4196, 550–553.
16. Laura Kela, Juha Knuutinen, Juha Linnanto, Reijo Suontamo, Soili Peltonen, and Terhi Saari, 'Interactions between cationic starch derivatives and cellulose studied by molecular modelling' *The Proceedings of the First Applied Pulp and Paper Molecular Modelling Symposium*, **2006**, Cascaded Inc., ISBN: 2-9808323-3-2, 247–253.
17. Juha Linnanto and Jouko Korppi-Tommola, 'Quantum Chemical Simulation of Excited States of Chlorophylls, Bacteriochlorophylls and Their Complexes', *Phys. Chem. Chem. Phys.* **8** (2006) 663–687 (invited article).

18. Juha Linnanto, Jari Martiskainen, Viivi Lehtovuori, Janne Ihalainen, Robertas Kananavicius, Roberto Barbato, and Jouko Korppi-Tommola, 'Excitation Energy Transfer in the LHC-II Trimer: A Model Based on the New 2.72 Å Structure', *Photosynth. Res.* **87** (2006), 267–279.
19. K. Laihia, A. Puszko, J. Linnanto, and E. Kolehmainen, '¹H, ¹³C and ¹⁵N NMR spectral and theoretical studies of some methyl and alkylamino derivatives of 4-halopyridine N-oxides', *J. Mol. Struct.* **783** (2006), 73–78.
20. Viivi Lehtovuori, Pasi Myllyperkiö, Juha Linnanto, Cristian Manzoni, Dario Polli, Giulio Cerullo, Matti Haukka, and Jouko Korppi-Tommola, 'Study of Mechanisms of Light- Induced Dissociation of Ru(dcbpy)(CO)₂I₂ in Solution down to 20 fs Time Resolution', *J. Phys. Chem. B.* **109** (2005), 17538–17544.
21. Pál Perjési, Erkki Kolehmainen, Erzsébet Ösz, Juha Linnanto, and Elina Virtanen, '*E*-2-Benzylidenebenzocycloalkanones IV. Studies on transmission of substituent effects on ¹³C NMR chemical shifts of *E*-2-(*X*-benzylidene)-1-tetralones, and -benzosuberones. Comparison with the ¹³C NMR data of chalcones and *E*-2-(*X*-benzylidene)-1-indanones', *J. Mol. Struct.* **740** (2005) 81–89.
22. Jarmo Ropponen, Jari Tamminen, Manu Lahtinen, Juha Linnanto, Kari Rissanen, and Erkki Kolehmainen, 'Synthesis, Characterization and Thermal Behavior of Steroidal Dendrons', *Eur. J. Org. Chem.* **2005** (2005) 73–84.
23. Aleksandr Ellervee, Juha Linnanto, and Arvi Freiberg, 'Spectroscopic and Quantum Chemical Study of Pressure-Effects on Solvated Chlorophyll', *Chem. Phys. Lett.* **394** (2004) 80–84.
24. J. Linnanto and J. E. I. Korppi-Tommola, 'Structure and Spectroscopic Properties of Mg-Bacteriochlorin, and Methyl Bacteriochlorophyllides *a*, *b*, *g*, and *h* Studied by Semiempirical, *Ab Initio* and Density Functional Molecular Orbital Methods', *J. Phys. Chem. A.* **108** (2004) 5872–5882.
25. P. Perjési, A. Perjessy, E. Kolehmainen, E. Osz, M. Samalikova, J. Linnanto, and E. Virtanen, '*E*-2-Benzylidenebenzocycloalkanones III. Studies on transmission of substituent effects on carbonyl stretching frequencies, ¹³C NMR chemical shifts of *E*-2-(*X*-benzylidene)-1-indanones. Comparison with the IR data of *E*-2-(*X*-benzylidene)-1-indanones, -tetralones and benzosuberones.', *J. Mol. Struct.* **697** (2004) 41–47.
26. Juha Linnanto and Jouko Korppi-Tommola, 'Semiempirical PM5 molecular orbital study on chlorophylls and bacteriochlorophylls: Comparison of semiempirical, *ab initio*, and density functional results', *J. Comput. Chem.* **25** (2004) 123–138.
27. Kalle I. Nättinen, Juha Linnanto, and Kari Rissanen, 'Dimensional Variation in Polymeric Metallo-Organic Frameworks', *Eur. J. Inorg. Chem.* **2003** (2003) 4078–4086.
28. Tanja Lahtinen, Elina Wegelius, Juha Linnanto, and Kari Rissanen, 'Small hydrocarbon cyclophanes; Synthesis, X-ray Analysis and Molecular Modelling', *Eur. J. Org. Chem.* (2002) 2935–2941.
29. Elina Virtanen, Jari Tamminen, Juha Linnanto, Pia Mänttari, Pirjo Vainiotalo, and Erkki Kolehmainen, 'Synthesis, ¹H, ¹³C, ¹⁵N, and ¹¹³Cd NMR, ESI-TOF MS, Semiempirical MO (PM3), *ab initio*/HF and Cation/Anion Binding Studies of N-deoxycholyl-L-tryptophan', *J. Incl. Phenom. Mol. Recogn. Chem.* **43** (2002) 319–327.
30. J. E. I. Korppi-Tommola and J. M. Linnanto, 'An exciton model to calculate spectra, intra- and intercomplex energy transfer rates of photosynthetic light harvesting antenna' *PS2001 Proceedings 12th International Congress on Photosynthesis, 2002* (CSIRO Publishing, ISBN : 0643067116).

31. J. M. Linnanto and J. E. I. Korppi-Tommola, 'Spectroscopic properties of chlorophylls and bacteriochlorophylls studied by molecular orbital CI methods' *PS2001 Proceedings 12th International Congress on Photosynthesis*, 2002 (CSIRO Publishing, ISBN: 0643067116).
32. J. Linnanto, J. A. I. Oksanen, and J. E. I. Korppi-Tommola, 'Exciton interactions in Self-Organized Bacteriochlorophyll *a* - Aggregates', *Phys. Chem. Chem. Phys.* **4** (2002) 3061–3070.
33. J. Linnanto and J. E. I. Korppi-Tommola, 'Theoretical Study of Excitation Transfer from Modified B800 ring of the LH II Antenna Complex of *Rps. acidophila*', *Phys. Chem. Chem. Phys.* **4** (2002) 3453–3460.
34. Janne A. Ihalainen, Juha Linnanto, Ivo H. M. van Stokkum, Pasi Myllyperkiö, Jani Kallioinen, Beate Ücker, Hugo Scheer, and Jouko E. I. Korppi-Tommola, 'Energy Transfer in LH2 of *Rhodospirillum molischianum*, studied by subpicosecond spectroscopy and configuration interaction exciton calculations' *J. Phys. Chem. B.* **105** (2001) 9849–9856.
35. Jari Koivisto, Erkki Kolehmainen, Vladimir A. Nikiforov, Maija Nissinen, Juha Linnanto, Mirja Lahtiperä, Sergei A. Miltsov, and Vladimir S. Karavan, 'A new potential toxaphene congener: synthesis, GC/EI-MS study, crystal structure, NMR analysis, and ab initio calculations of 3-endo,5-endo-dichloro-7,7-bis-chloromethyl-4-dichloromethyl-tricyclo[2.2.1.0^{2,6}] heptane', *Chemosphere.* **44** (2001) 671–679.
36. Juha Linnanto and Jouko Korppi-Tommola, 'Spectroscopic properties of Mg-chlorin, Mg-bacteriochlorin and bacteriochlorophylls *a*, *b*, *c*, *d*, *e*, *f*, *g* and *h*, studied by semiempirical and ab initio MO/CI methods', *J. Phys. Chem. A.* **105** (2001) 3855–3866.
37. Mervi Haapala, Erkki Kolehmainen, Jari Tamminen, Reijo Kauppinen, Juha Linnanto, Elina Virtanen, Reijo Suontamo, and Pirjo Vainiotalo, 'Macrocycles prepared from lithocholic acid, piperazine and isomeric pyridine dicarboxylic acids and their selective affinities towards sodium and potassium', *Mater. Sci. Eng. C.* **18** (2001) 21–23.
38. J. Linnanto and J. E. I. Korppi-Tommola, 'Spectroscopic properties of Mg-chlorin, Mg-porphin and chlorophylls *a*, *b*, *c*₁, *c*₂, *c*₃ and *d* studied by semiempirical MO/CI methods', *Phys. Chem. Chem. Phys.*, **2** (2000) 4962–4970.
39. Jari Tamminen, Erkki Kolehmainen, Mervi Haapala, and Juha Linnanto, 'Bile Acid-Piperazine Diamides: Novel Steroidal Templates in Synthesis of Supramolecular Hosts: Isomeric Pyridine-*n*-carboxy Containing Dimers and a Cholaphane', *SYNTHESIS*, (2000), 1464–1468.
40. Erkki Kolehmainen, Katri Laihia, Maija Nissinen, Juha Linnanto, Alexander Perjéssy, Bernard Gautheron, and Roland Broussier, 'Chlorodicyclopentadienyloxoniobium(V) complexes revisited: the origin of the asymmetry of ¹H and ¹³C NMR spectra, X-ray crystal structures and ab-initio/HF and DFT/B3LYP calculations', *J. Organomet. Chem.* **613** (2000) 7–12.
41. Jari Tamminen, Erkki Kolehmainen, Juha Linnanto, Hannu Salo, and Piia Mänttari, '3 α ,3' α -Bis(*n*-Acetoxyphenylcarboxy)-5 β -cholan-24-oic Acid Ethane-1,2-diol Diesters (*n*=2–4): ¹³C NMR Chemical Shifts, Variable Temperature ¹H NMR Measurements, and MO Calculations of Novel Bile Acid Based Dimers', *Magn. Reson. Chem.*, **38** (2000) 877–882.
42. J. Linnanto and J. E. I. Korppi-Tommola, 'Excitation energy-transfer in the LH2 antenna of photosynthetic purple bacteria via excitonic B800 and B850 states', *J. Chin. Chem. Soc.*, **47** (2000) 657–665.
43. Jari T. Tamminen, Erkki T. Kolehmainen, Mervi H. Haapala, Hannu T. Salo, and Juha M. Linnanto, 'Synthesis and ¹³C NMR chemical shift assignments of 2,2'-bipyridine-4,4'-dicarboxylates of bile acid methyl esters', *ARKIVOC*, **1** (2000) 90–96.

44. Jari Tamminen, Erkki Kolehmainen, Juha Linnanto, Pirjo Vainiotalo, Sami Vuorikoski, and Reijo Kauppinen, '¹³C, ¹⁵N and ¹¹³Cd NMR and molecular orbital studies of novel bile acid N-(2-aminoethyl)amides and their Cd²⁺-complexes', *J. Incl. Phenom. Mol. Recogn. Chem.*, **37** (2000) 121–130.
45. J. Linnanto, J. E. I. Korppi-Tommola, and V. M. Helenius, 'Electronic states, absorption spectrum and circular dichroism spectrum of the photosynthetic bacterial LH2 antenna of *Rhodospseudomonas acidophila* as predicted by exciton theory and semiempirical calculations', *J. Phys. Chem. B.*, **103** (1999) 8739–8750.
46. Erkki Kolehmainen, Jari Tamminen, Reijo Kauppinen, and Juha Linnanto, 'Silver(I) cation complexation with 3 α , 3' α -Bis(pyridine-n-carboxy) lithocholic acid 1,2-ethanediol diesters (n = 2–4): ¹H, ¹³C and ¹⁵N NMR spectral studies and molecular orbital calculations', *J. Incl. Phenom. Mol. Recogn. Chem.*, **35** (1999) 75–84.
47. J. Linnanto, V. M. Helenius, J. A. I. Oksanen, T. Peltonen, J.-L. Garaud, and J. E. I. Korppi-Tommola, 'Exciton interactions and femtosecond relaxation in chlorophyll *a* - water and chlorophyll *a* - dioxane aggregates', *J. Phys. Chem. A.*, **102** (1998) 4337–4349.
48. E. Laitinen, J. Linnanto, and J. E. I. Korppi-Tommola, 'Dielectric effects on rotational reorientation of three cyanine dyes in n-alcohol solutions', *J. Chem. Phys.*, **107** (1997) 7601–7611.