

Dr. sc. Srećko Kirin

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EDUCATION

- 1998 **Dr. sc.** in Chemistry, University of Zagreb, Croatia
1994 **M. sc.** in Organic chemistry, University of Zagreb, Croatia
1991 **Diploma (B. Sc.)** in Chemistry, University of Zagreb, Croatia

RESEARCH EXPERIENCE

- 2008- **Research Associate** (eq. to Assist. Professor), Ruđer Bošković Institute
2008 **Senior Assistant**, Ruđer Bošković Institute
 Magnetic materials; with Dr. sc. Pavica Planinić
2006-2007 **Postdoctoral Assistant**, Pennsylvania State University, USA
 Bioinorganic materials; with Professor Mary Elizabeth Williams
2001-2006 **Postdoctoral Assistant**, University of Heidelberg, Germany
 Bioinorganic chemistry; with Professor Nils Metzler Nolte
1995-2001 **Dr. sc. Student** (since 1998 **Senior Assistant**), Ruđer Bošković Institute
 Organometallic chemistry; with Dr. sc. Mirjana Eckert-Maksić
1993-1995 **M. sc. Student**, Ruđer Bošković Institute
 Enantioselective catalysis; with Professor Vitomir Šunjić
1992-1993 **Industrial Researcher**, PLIVA Pharmaceutical Industry, Croatia
 Pharmaceutical chemistry; with Dr. sc. Zdravko Crnić
1991 **Undergraduate (B. Sc.) Student**, University of Zagreb, Croatia
 Natural product synthesis; with Professor Ante Deljac

RESEARCH INTERESTS

- Coordination chemistry of transition metals and lanthanides
- Inorganic stereochemistry. Homogeneous catalysis
- Synthetic bioinorganic and bioorganometallic chemistry
- (Bio)organic synthesis of nitrogen ligands, (pseudo-)peptides & nucleic acid analogs

PUBLICATIONS AND PRESENTATIONS

38 publications (1 book chapter, 27 peer-reviewed journal paper, 2 patents, 8 other paper)
65 presentations (51 conference abstract and 14 public seminars)

TEACHING EXPERIENCE

- Currently supervising 1 Dr. Sc. student. Immediately supervised 1 Dr. Sc., 5 Diploma and 10 undergraduate students
- Contributed to establish chemistry courses in the newly formed molecular biotechnology B. Sc. / M. Sc. program at the University of Heidelberg, Germany
- Contributed to the project "E-school", Croatian natural sciences society (1998-2001), working on the improvement of chemistry teaching in Croatian high schools

Teaching Assistant, Advanced Inorg Chem Lab, University of Zagreb, Croatia, 2008-

Teaching Assistant, Lab courses & seminars, University of Heidelberg, Germany, 2001-06
General chemistry; Inorganic chemistry; Organic chemistry; Chemistry of biopolymers

Adjunct Lecturer, General chemistry seminar, Open College Zagreb, Croatia, 1998-2000

Undergrad. Teaching Assistant, Org Chem Lab, University of Zagreb, Croatia, 1990-91

CURRENT RESEARCH GRANTS

Organometallic and inorganic bioconjugates as potential enantioselective catalysts (2009-2011); Homeward grant program (200.000 €), Unity Through Knowledge Fond, Croatia (with international peer-review); principle investigator: Dr. sc. Srećko Kirin

Metallated bioconjugates for applications in biological and material sciences (2009-2010) Homing grant program (100.000 €), National foundation for science, Croatia (with international peer-review); principle investigator: Dr. sc. Srećko Kirin

SELECTED AWARDS

Volkswagen Foundation Postdoctoral Research Scholarship (2001-2003)
with Professor Nils Metzler-Nolte, University of Heidelberg, Germany

Swiss National Science Foundation Scholarship (2000), for the attendance of the 35th Conference on Stereochemistry, Bürgenstock, Switzerland

Eugene Corey Memorial Fund Scholarship (1999), for the attendance of the 12th International Symposium on Organosilicon Chemistry, Sendai, Japan

DAAD Graduate Research Scholarship (1997), with Professor Paul Rademacher, University GH Essen, Germany

Diploma, Croatian Chamber of Economy (1993), Zagreb, Croatia;
for accomplishments and merits in promoting Croatian economy

Gold medal, 42nd World Exhibition of Invention EUREKA (1993), Brussels, Belgium;
for "New synthesis of fluoxetine (Prozac[®])"

OeAD Undergraduate Research Scholarship (1991), with Professor Thomas Kappe, Karl-Franzens University, Graz, Austria

PLIVA Undergraduate Scholarship (1988-91), PLIVA Pharma. Industry, Zagreb, Croatia

BOOK CHAPTER

1. **S. I. Kirin**, R. Krämer, N. Metzler-Nolte: "Nuclease and peptidase models", In: **Concepts and Models in Bioinorganic Chemistry**, H.-B. Kraatz, N. Metzler-Nolte (Eds.), Wiley-VCH, Weinheim, Germany; **2006**, 159-175.

JOURNAL PAPER

27. **S. I. Kirin**, U. Schatzschneider, S. D. Köster, D. Siebler, N. Metzler-Nolte: "A systematic evaluation of different hydrogen bonding patterns in unsymmetrical 1,*n*'-disubstituted ferrocenoyl peptides", **Inorg. Chim. Acta.** **2009**, 362, 894-906.
26. L. A. Levine, **S. I. Kirin**, C. P. Myers, S. A. Showalter, M. E. Williams: "Heterometallic ferrocene-rhenium complexes linked by an aminoethylglycine scaffold", **Eur. J. Inorg. Chem.** **2009**, 613-621.
25. **S. I. Kirin**, I. Ott, R. Gust, W. Mier, T. Weyhermüller, N. Metzler-Nolte: "Cellular uptake quantification of metallated peptide and peptide nucleic acid bioconjugates by atomic absorption spectroscopy", **Angew. Chem.** **2008**, 120, 969-973; **Angew. Chem. Int. Ed.** **2008**, 47, 955-959.
24. **S. I. Kirin**, T. Weyhermüller, K. Merz, N. Metzler-Nolte: "The X-ray single crystal structures of an acid-functionalized bis(2-picolyl)amine (bpa) ligand with Palladium(II) and Zinc(II) display different intermolecular interactions around the common (H₂O)₂ (anion)₂ motif", **Z. Anorg. Allg. Chem.** **2007**, 633, 2706-2710.
23. J. L. Jios, **S. I. Kirin**, N. N. Buceta, T. Weyhermüller, C. O. Della Vedova, N. Metzler-Nolte: "Synthesis and structural characterization of metallated bioconjugates: C-terminal labeling of amino acids with aminoferrocene", **J. Organomet. Chem.** **2007**, 692, 4209-4214. A top 25 most downloaded J. Organomet. Chem. article in July - September 2007.
22. **S. I. Kirin**, H. P. Yennawar, M. E. Williams: "Synthesis and characterization of Cu(II) complexes with amino acid substituted di(2-pyridyl)amine ligands", **Eur. J. Inorg. Chem.** **2007**, 3686-3694. A top 10 most accessed Eur. J. Inorg. Chem. article in August 2007.
21. **S. I. Kirin**, K. Ohr, H. P. Yennawar, C. M. Morgan, L. A. Levine, M. E. Williams: "Synthesis and X-ray single crystal structure analysis of an inorganic nucleoside analog", **Inorg. Chem. Commun.** **2007**, 10, 652-656. A top 25 most downloaded Inorg. Chem. Commun. article in April - June 2007.
20. S. Pfander, R. Fiammengo, **S. I. Kirin**, N. Metzler-Nolte, A. Jäschke: "Reversible site-specific tagging of enzymatically synthesized RNAs using aldehyde-hydrazine chemistry and protease-cleavable linkers", **Nucleic Acids Res.** **2007**, 35, e25/1-e25/8. Named "April 2007 highlight" at www.glenres.com and included in the prestigious internet service "Faculty of 1000 Biology".
19. **S. I. Kirin**, F. Noor, N. Metzler-Nolte, W. Mier: "Manual solid-phase peptide synthesis of metallocene - peptide bioconjugates", **J. Chem. Educ.** **2007**, 84, 108-111.
18. J. L. Jios, **S. I. Kirin**, T. Weyhermüller, N. Metzler-Nolte, C. O. Della Vedova: "Synthesis, structural and spectroscopic study of aromatic thioester compounds", **J. Mol. Struct.** **2006**, 825, 53-59.

17. L. Barišić, M. Čakić, K. A. Mahmoud, Y.-n. Liu, H.-B. Kraatz, H. Pritzkow, **S. I. Kirin**, N. Metzler-Nolte, V. Rapić: "Helically chiral ferrocene peptides containing 1'-amino-ferrocene-1-carboxylic acid subunit as turn inducers", **Chem. Eur. J.** **2006**, 12, 4965-4980. Featured on the inner cover of the journal. A top 10 most accessed Chem. Eur. J. article in June 2006.
16. **S. I. Kirin**, U. Schatzschneider, X. De Hatten, T. Weyhermüller, N. Metzler-Nolte: "1,n'-Disubstituted ferrocenoyl amino acids and dipeptides: Conformational analysis by CD spectroscopy, X-ray crystallography, and DFT calculations", **J. Organomet. Chem.** **2006**, 691, 3451-3457.
15. T. Kersebohm, **S. I. Kirin**, N. Metzler-Nolte: "Introduction of an internal dipeptide into PNA oligomers: Thermal melting studies and further functionalisation", **Bioorg. Med. Chem. Lett.** **2006**, 16, 2964-2968.
14. **S. I. Kirin**, H.-B. Kraatz, N. Metzler-Nolte: "Systematizing structural motifs and nomenclature in 1,n'-disubstituted ferrocene peptides", **Chem. Soc. Rev.** **2006**, 35, 348-354. Featured on the front cover of the journal.
13. M. Eckert-Maksić, D. Margetić, **S. Kirin**, D. Milić, D. Matković-Čalogović: "High pressure assisted synthesis of fused norbornenes containing two 7-metallo-norbornene units", **Eur. J. Org. Chem.** **2005**, 4612-4620.
12. **S. I. Kirin**, D. Wissenbach, N. Metzler-Nolte: "Unsymmetrical 1,n'-disubstituted ferrocenoyl peptides: Convenient one pot synthesis and solution structures by CD and NMR spectroscopy", **New J. Chem.** **2005**, 29, 1168-1173.
11. **S. I. Kirin**, P. Dübon, T. Weyhermüller, E. Bill, N. Metzler-Nolte: "Amino acid and peptide bioconjugates of Cu(II) and Zn(II) complexes with a modified bis(2-picolyl) amine ligand", **Inorg. Chem.** **2005**, 44, 5405-5415.
10. L. Barišić, M. Dropučić, V. Rapić, H. Pritzkow, **S. I. Kirin**, N. Metzler-Nolte: "The first oligopeptide derivative of 1'-amino-ferrocene-1-carboxylic acid shows helical chirality with antiparallel strands", **Chem. Commun.** **2004**, 2004-2005.
9. **S. I. Kirin**, C. M. Happel, S. Hrubanova, T. Weyhermüller, C. Klein, N. Metzler-Nolte: "Synthesis, structure and comparison of the DNA cleavage ability of metal complexes M(II)L with the N-(2-ethoxyethanol)-bis(2-picolyl)amine ligand L (M = Co, Ni, Cu and Zn)", **Dalton Trans.** **2004**, 1201-1207.
8. M. Eckert-Maksić, S. Kazazić, S. Kazazić, **S. I. Kirin**, L. Klasinc, D. Srzić, D. Žigon: "Electron ionisation induced fragmentation of fused norbornene analogues containing SiMe₂ or GeMe₂ and oxygen bridges. Migration of SiMe₂ and GeMe₂ groups", **Rapid Commun. Mass Spectrom.** **2001**, 15, 462-465.
7. **S. I. Kirin**, F.-G. Klärner, M. Eckert-Maksić: "High pressure synthesis of new silicon containing heteroatom analogues of fused norbornenes", **Synlett** **1999**, 351-353.
6. **S. I. Kirin**, D. Vikić-Topić, E. Meštrović, B. Kaitner, M. Eckert-Maksić: "Diels-Alder reactions of C-phenylated siloles with 1,4-epoxy-1,4-dihydronaphthlene", **J. Organomet. Chem.** **1998**, 566, 85-91.
5. S. Đaković, L. Liščić-Tumir, **S. I. Kirin**, V. Vinković, Z. Raza, A. Šušte, V. Šunjić: "Enantioselectivity in cyclopropanation catalysed by Cu(I) complexes increased by π stacking of two monodentate oxazoline ligands", **J. Mol. Catal. A: Chem.** **1997**, 118, 27-31.

4. Z. Majer, M. Hollosi, **S. I. Kirin**, V. Šunjić: "Chiroptical properties and conformation of chiral enamines of 2-(2'-pyrido, or quinolino)acetophenone", **Chirality** **1996**, 8, 244-248.
3. **S. I. Kirin**, V. Vinković, V. Šunjić: "Chiral enamines derived from 2-(2'-pyrido)acetophenone and 2-(2'-quinolino)acetophenone as ligands in copper(I) catalyzed enantioselective cyclopropanations", **Chirality** **1995**, 7, 115-120.
2. B. Kaitner, **S. I. Kirin**, E. Meštrović: "Two similar lactone-hydrochlorides with different types of hydrogen bonding networks: Crystal structure of (R,S)- α -amino- γ -caprolactone hydrochloride and racemic α -amino- γ -methyl- γ -valerolactone hydrochloride semi-hydrate", **J. Chem. Crystallogr.** **1995**, 25, 117-122.
1. A. Deljac, B. Kaitner, **S. I. Kirin**, E. Meštrović: "Structure of [(2S,4R)- γ -hydroxynorvalinato] [(2R,4S)- γ -hydroxynorvalinato]-copper(II)", **Acta Crystallogr., Sect. C: Cryst. Struct. Commun.** **1993**, C49, 1354-1357.

PATENTS

2. Z. Crnić, **S. I. Kirin**: "New procedure for the preparation of N-methyl-3-(p-trifluoromethylphenoxy)-3-phenylpropylamine", **Cro. patent** P930130 (11.04.2000); in Croatian.
1. Z. Crnić, **S. I. Kirin**: "N-substituted derivatives of N-methyl-3-(p-trifluoromethylphenoxy)-3-phenylpropylamine and the procedure for their preparation", **US patent** 5.618.968 (08.04.1997), **Eur. patent** 617.006 (06.05.1998); **Chem. Abstr.** **1994**, 121, 300582.

OTHER PAPER

8. H. P. Yennawar, **S. Kirin**, S. Borkar, M. B. Williams, A. Sen: "Crystal structures of modified PNA analogues and of cationic diimine Pd(II)-alkyl complex", **Abstracts of the XXI IUCr Congress**, XXI Congress of the International Union of Crystallography, **Acta Crystallogr.** **2008**, A64, C413.
7. J. L. Jios, N. N. Buceta, **S. I. Kirin**, N. Metzler-Nolte, C. O. Della Vedova, T. Weyhermüller: "Synthesis and structural characterization of metallated bioconjugates: C-terminal labeling of amino acids with ferroceneamine", In: J. A. Seijas, M. P. Vazquez-Tato, (Eds.). **Proceedings of ECSOC-10**, The Tenth International Electronic Conference on Synthetic Organic Chemistry; MDP International, Basel, Switzerland; **2006**, c013/1-c013/10.
6. D. Margetić, M. Eckert-Maksić, **S. Kirin**: "High pressure assisted synthesis of fused norbornenes containing two 7-metallonorbornene units", In: J. A. Seijas, M. P. Vazquez-Tato, (Eds.). **Proceedings of ECSOC-8**, The Eighth International Electronic Conference on Synthetic Organic Chemistry; MDP International, Basel, Switzerland; **2004**, 85-92.
5. **S. I. Kirin**, C. M. Happel, C. Klein, N. Metzler-Nolte: "Cu(II) complexes of nitrogen ligand - oligopeptide conjugates as potential artificial nucleases", In: R. Epton, (Ed.). **Proceedings of SPS-8**, Proceedings of the 8th International Symposium Solid

Phase Synthesis and Combinatorial Libraries, London 2003, Mayflower Ltd., Kingswinford, U. K.; **2004**, 261-262.

4. **S. I. Kirin**: "The use of the internet in teaching experimental chemistry", **Priroda 2001**, 91 (4), 40-41; in Croatian.
3. **S. I. Kirin**, M. Eckert-Maksić: "Synthesis of organic compounds under high pressure", **Kem. Ind. 1999**, 48, 335-343; **Chem. Abstr. 1999**, 131, 310248; a review in Croatian.
2. V. Cmrečki, F. Kovačić, A. Kučak, **S. I. Kirin**: "Isolation of fructose and inuline from dandelion roots (*Taraxacum officinale* Web.)", <http://hpd.botanic.hr/kem/inulin/>, **1999**; in Croatian.
1. **S. I. Kirin**, G. Štefanić: "Spectrometry", <http://hpd.botanic.hr/kem/knjiga/spektri.htm>, **1998**; in Croatian.

RECENT CONFERENCE ABSTRACTS

51. H. P. Yennawar, **S. Kirin**, S. Borkar, M. B. Williams, A. Sen: "Crystal structures of modified PNA analogues and of cationic diimine Pd(II)-alkyl complex", XXI Congress of the International Union of Crystallography, Osaka, Japan, 23.08.-31.08.**2008**; Book of Abstracts, P07.07.48, poster.
50. L. A. Levine, **S. I. Kirin**, C. P. Myers, C. M. Morgan, M. E. Williams: "Self-assembly of homo- and heterometallic complexes linked by artificial oligopeptides", 236th American Chemical Society Meeting, Philadelphia PA, USA, 17.08.-21.08.**2008**; Abstracts of papers, INOR 752, oral presentation.
49. **S. I. Kirin**, M. E. Williams, "Inorganic models of nucleic acids: Synthesis and characterization of Cu(dpa)₂ complexes", 234th American Chemical Society Meeting, Boston MA, USA, 19.08.-23.08.**2007**; Abstracts of papers, INOR 979.
48. L. Barišić, M. Čakić Semenčić, **S. I. Kirin**, N. Metzler-Nolte, H. Pritzkow, V. Rapić: "Study of hydrogen-bonding patterns in ferrocene peptides", 20th Croatian Meeting of Chemists and Chemical Engineers, Zagreb, Croatia, 26.02.-01.03.**2007**; Book of Abstracts, P-A63, poster.
47. **S. I. Kirin**, M. E. Williams: "Inorganic models of nucleic acids: Synthesis & structure of Cu(dpa)₂ complexes", 20th Croatian Meeting of Chemists and Chemical Engineers, Zagreb, Croatia, 26.02.-01.03.**2007**; Book of Abstracts, P-A29.
46. M. E. Williams, K. Ohr, C. P. Myers, **S. I. Kirin**: "Oligopeptide-linked multichromophore assemblies as molecular antennas", 18th Annual Kavli Frontiers of Science Symposium, Irvine CA, USA, 02.11.-04.11.**2006**, poster.
45. J. L. Jios, N. N. Buceta, **S. I. Kirin**, N. Metzler-Nolte, C. O. Della Vedova, T. Weyhermüller: "Synthesis and structural characterization of metallated bioconjugates: C-terminal labeling of amino acids with ferroceneamine", 10th International Electronic Conference on Synthetic Organic Chemistry, 01.11-30.11.**2006**, C013, electronic poster.
44. S. Pfander, R. Fiammengo, **S. Kirin**, N. Metzler-Nolte, A. Jäschke: "A reversible, site-specific labeling of enzymatically synthesized RNA", Joint Meeting of the Czech,

- German and Hungarian Pharmaceutical Societies, Marburg, Germany, 04.10.-07.10.2006; Programme and Abstract book, C047, poster.
43. T. Kersebohm, **S. I. Kirin**, N. Metzler-Nolte: "Internal functionalization of PNA oligonucleotides via a substituted dipeptide unit", 9th International Electronic Conference on Synthetic Organic Chemistry, 01.11-30.11.2005, B003, electronic poster.
 42. S. Pfander, **S. I. Kirin**, N. Metzler-Nolte, A. Jäschke: "Chemoenzymatic synthesis of complex multifunctional RNA-peptide conjugates for the in vitro selection of protease ribozymes", Meeting of the German Pharmaceutical Society, Mainz, Germany, 05.10.-08.10.2005; poster.
 41. **S. I. Kirin**: "Bioorganometallic chemistry of ferrocene", 230th American Chemical Society Meeting, Washington DC, USA, 28.08.-01.09.2005; Abstracts of papers, AEI 91, poster.
 40. N. Metzler-Nolte, **S. I. Kirin**, U. Schatzschneider: "1,n'-Ferrocene peptides as organometallic turn mimics", 230th American Chemical Society Meeting, Washington DC, USA, 28.08.-01.09.2005; Abstracts of papers, INOR 51, oral presentation.
 39. S. Pfander, **S. I. Kirin**, N. Metzler-Nolte, A. Jäschke: "Chemoenzymatic synthesis of complex multifunctional RNA-peptide conjugates for the in vitro selection of protease ribozymes", 2nd Nucleic Acid Chemical Biology Symposium, Odense, Denmark, 19.06.-23.06.2005; Program and Abstracts, P-16, poster.
 38. D. Margetić, M. Eckert-Maksić, **S. Kirin**: "Synthesis of polycyclic organometallic compounds under high pressure and quantum chemical study of reactivity of cyclic organometallic dienes", 19th Croatian Meeting of Chemists and Chemical Engineers, Opatija, Croatia, 24.04.-27.04.2005; Book of Abstracts, p. 92, poster.
 37. L. Barišić, M. Čakić, **S. I. Kirin**, N. Metzler-Nolte, H. Pritzkow, V. Rapić: "Synthesis and characterization of ferrocene containing peptides in solution", 19th Croatian Meeting of Chemists and Chemical Engineers, Opatija, Croatia, 24.04.-27.04.2005; Book of Abstracts, p.78, oral presentation.
 36. X. De Hatten, **S. I. Kirin**, N. Metzler-Nolte: "Structural and functional hydrogenase model systems with pre-organized peptide ligands", Molecular Catalysts: Structure and functional design (SFB 623), Heidelberg, Germany, 06.04.2005, poster.
 35. **S. I. Kirin**, D. Wissenbach, N. Metzler-Nolte: "Disubstituted 1,n'-ferrocene peptides as organometallic turn mimics", 3rd German Ferrocene Colloquium, Heidelberg, Germany, 24.02.-25.02.2005, oral presentation.

RECENT PUBLIC SEMINARS

14. **S. I. Kirin**: "Chemistry research at the Ruđer Bošković Institute", Open Day, Chemistry Department, Faculty of Science, Zagreb, 10.03.2009; invited lecture.
13. **S. I. Kirin**: "Inorganic models of natural compounds: Artificial enzymes and artificial nucleic acids", Ruđer Bošković Institute, Zagreb, Croatia, 09.09.2008; promotion lecture.
12. L. Brkić, **S. I. Kirin**: "Effective Proposal Writing in English", Colloquium of the Ruđer Bošković Institute, Zagreb, Croatia, 12.06.2008.

11. **S. I. Kirin**: "Inorganic models of nucleic acids", Inorganic and Analytical Chemistry Colloquium, Department of Chemistry, Ruhr University Bochum, Germany, 18.05.2007; invited lecture.
10. **S. I. Kirin**: "Artificial metalloenzymes: Sequence specific cleavage of oligonucleotides", 10th Colloquium of the Department of Organic Chemistry and Biochemistry, Ruđer Bošković Institute and the Organic Chemistry Section of the Croatian Chemical Society, Zagreb, Croatia, 11.05.2007; invited lecture.
9. **S. I. Kirin**: "Artificial metalloenzymes: Sequence specific cleavage of oligonucleotides", Pennsylvania State University, University Park PA, USA, 20.04.2006.
8. **S. I. Kirin**: "Artificial metalloenzymes: Sequence specific cleavage of oligonucleotides", Ecole Normale Supérieure de Lyon, France, 09.12.2005; invited lecture.
7. **S. I. Kirin**: "Artificial metalloenzymes: Sequence specific cleavage of oligonucleotides", University of Zürich, Switzerland, 25.11.2005; invited lecture.
6. D. Margetić, M. Eckert-Maksić, **S. Kirin**, Y. Murata, K. Komatsu: "High pressure synthesis of 7-silanorbornenes and 7-germanorbornenes and study of their double bond pyramidalization", 2005.

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