

Curriculum vitae - Hans-Petter Hersleth

PERSONAL INFORMATION

Family name, First name: Hersleth, Hans-Petter

Date of birth: 11.01.1976

Sex: Male

Nationality: Norwegian

Researcher unique identifier(s): ORCID 0000-0002-1142-9983

Web site: <http://hersleth.org>

EDUCATION

- 2007 Doctor Scientiarum (PhD), Department of Chemistry, University of Oslo, Norway
- 2004 Teacher Education Program, (one-year) "Praktisk-pedagogisk utdanning", Department of Teacher Education and School Development, University of Oslo, Norway
- 2000 Master (Candidatus Scientiarum). Department of Chemistry, University of Oslo, Norway
- 1998 Candidatus Magisterius, (Bachelor) University of Oslo, Norway

CURRENT AND PREVIOUS POSITIONS

- 2014-Present Principal Investigator and Senior Lecturer, Department of Biosciences, Section for Biochemistry and Molecular Biology, and Department of Chemistry (from 2017), Section for Chemical Life Sciences, University of Oslo, Norway
- 2012-2014 Researcher, Department of Biosciences, Section for Biochemistry and Molecular Biology, University of Oslo, Norway. Teaching amount 25%.
- 2012-2012 Lecturer at Oslo Handelsgymnasium in 55% position (6 months)
- 2007-2012 Post doc., Department of Molecular Biosciences, University of Oslo, Norway, with ~20% teaching (Employed 30% Aug 2011- Jun 2012)
- 2007-2007 Temporary lecturer and researcher (25% per week), Department of Chemistry, University of Oslo, Norway (6 months)
- 2006-2007 Temporary College lecturer (38% per week), Faculty of Engineering, Oslo University College, Norway
- 2000-2006 PhD Fellow with 40% teaching, Department of Chemistry, University of Oslo, Norway

FELLOWSHIPS AND GRANTS

- 2014-2018 Norwegian Research Council FRINATEK / University of Oslo, "Young Researcher Grant", two positions (PhD-student and Researcher) ~ 7000kNOK, PI: Hans-Petter Hersleth
- 2016-2018 Norwegian Centennial Chair Program ~\$150.000, PI: Jeffrey A. Gralnick, University of Minnesota, Co-PI: Hans-Petter Hersleth
- 2018-2020 Norwegian Centennial Chair Program ~\$100.000, PI: Daniel Bond, University of Minnesota, Co-PI: Hans-Petter Hersleth
- 2016-2016 InterReg "ESS & MAX IV: Cross Border Science and Society" grant MAX4ESSFUN GU-003 (Salary: Post.doc. 6 months, Supervisor: 2 months). PI: Rosmarie Friemann, University of Gothenburg, Co-PI: Hans-Petter Hersleth

SUPERVISION OF GRADUATE STUDENTS AND RESEARCH FELLOWS

2009-Present Number of Postdocs/PhD/Master Students: 2/6/6
Department of Biosciences, University of Oslo, Norway

Postdocs/Researchers:

- ▶ Marta Hammerstad 2017-Present
- ▶ Niels H. Andersen 2018-Present

PhD-students:

Supervisor:

- ▶ Ingvild Gudim 2014-2018; Thesis: "*Characterisation of flavodoxins and ferredoxin/flavodoxin reductases from Bacillus cereus and their interactions*"
- ▶ Inger K. Olsbu 2017-2018 (Co-supervisor 2010-2017); Thesis: "*Substrate recognition and redox partner identification in nitric oxide synthases*"

Co-supervisor:

- ▶ Åsmund K. Røhr 2009-2010; Thesis: *Structural and Spectroscopic Studies of the Flavoprotein NrdI, Thioredoxin BC3987, and Ribonucleotide Reductase Diiron-protein R2*
- ▶ Marta Hammerstad 2010-2014; Thesis: *"Structural and Functional Studies of Proteins in the Class Ib Ribonucleotide Reductase System"*
- ▶ Marie Lofstad 2012-2016; Thesis: *"Activation pathways of the class Ib ribonucleotide reductase in Bacillus cereus"*
- ▶ Hedda Johannesen 2015-2019

Master students:

Supervisor:

- ▶ Bernt Wu 2014-2015; Thesis: *"Purification and characterization of Flavohemoglobin - A flavoheme enzyme"*
- ▶ Susanne Monka 2014-2015, Thesis: *"Structural and functional characterisation of ferredoxins in Bacillus cereus"*
- ▶ Marita Shoor 2016-2017, Thesis: *"Structural and functional characterization of the redox protein Thioredoxin reductase from Bacillus cereus"*

Co-supervisor:

- ▶ Marta Hammerstad 2009-2010; Thesis: *"Biochemical and Structural Characterization of the Bacillus cereus Thioredoxin BC3987 Mutants"*
- ▶ Silje Skråmo 2011-2012; Thesis: *"Studies of Electron Transfer from Flavodoxin Reductase to NrdI in Bacillus cereus"*
- ▶ Marie Lofstad 2011-2012; Thesis: *"The nitric oxide synthase protein system in Bacillus cereus - From gene to 3D structure"*

Additionally, Internal co-supervisor for 7 master students taking the master project externally.

MOBILITY (research stays abroad lasting more than three months)

2001-2001 Institute of Pharmacology and toxicology, Karl Franzens Universität Graz, Austria.
Award received from Norwegian Research Council, Norway

TEACHING ACTIVITIES

2018-Present Biochemistry 1 (10 stp) BIOS1130 (Univ. of Oslo) *Course responsible and lecturer.*

2017-Present Biochemistry 1 for chemist (10 stp) KJM1140 (Univ. of Oslo) *Course responsible (from 2018) and lecturer.*

2008-Present Methods in molecular biology & biochemistry II (10 stp) MBV4020 (Univ. of Oslo), *Course responsible* (Lectures 15h, exercises 10h, lab 50h) - Autumn and spring (15 times)

2010-Present BIOSTRUCT – Protein crystal spectroscopy (5 stp) MBV9220 (Univ. of Oslo), *Course responsible* (Lectures 10h, exercises 2h, lab 15h)

2004-Present Biomolecular Structures (10 stp) KJM5310 (Univ. of Oslo), 2004-2006 *Course responsible* (Lectures 30h, exercises 15h). From 2008 Guest lecturer.

2002-2005 Protein Crystallography (10 stp) KJM4350 (Univ. of Oslo), 2002-2004 *Lectures, exercises, lab*, 2005 *Course responsible* (Lectures 15h, exercises 10h, lab 15h).

2000 General Chemistry (15 stp) KJ100 (Univ. of Oslo) *Exercises and lab*

2001-2002 Introduction to Chemistry (10 stp) KJ050 (Univ. of Oslo) *Exercises and lab*

2006 Organic Chemistry I (10 stp) KJM1011 (Univ. of Oslo) *Lab*

2006-2007 Pre-course in Chemistry for Engineering Students FO933A (Oslo Univ. College)

2007-2010 Seminar for high-school chemistry teachers (Telemark and Oppland).

2012 High-school matemathics S1 & S2 (Oslo Handelsgymnasium)

2004-present Chemistry Olympiad

2018-present Biology Olympiad

AWARDS

1999 Norsk Hydro's Price for Excellent Results in Chemistry (Cand. Mag. Degree), 1998-99.

2015 Lecturer of the year "Golden laserpointer" awarded by the Student organisation for Molecular Bioscience students at University of Oslo.

ORGANISATION OF SCIENTIFIC MEETINGS

2018 Member of organisation committee for the 54th Norwegian Biochemical Society Contact meeting, and responsible for the Minisymposium on Education.

INSTITUTIONAL RESPONSIBILITIES

- 2015-2017 Member of the committee for renewing the Bachelor- and Master study programs in Biosciences, Univ. of Oslo.
- 2014-2017 Member of the committee for renewing the Bachelor- and Master study program in Chemistry, University of Oslo

MAJOR COLLABORATIONS

Involvement in following past and present research collaborations:

- ▶ **Jeffrey A. Gralnick, University of Minnesota, USA.**
Flavins and extracellular electron transport. Outcome: Seed grant 2016 NOCC.
- ▶ **Daniel R. Bond, University of Minnesota, USA.**
Cytochromes and extracellular electron transport. Outcome: Seed grant 2018 NOCC.
- ▶ **Vinai C. Thomas, University of Nebraska Medical Center, USA.**
Nitric oxide synthase. Outcome: Manuscript submitted (Paper 27).
- ▶ **Philip Ash and Kylie Vincent, University of Oxford, UK**
Spectroelectrochemistry on redox protein crystals
- ▶ **Wouter van Beek at the Swiss-Norwegian Beam Line at ESRF, France.**
In-situ single-crystal spectroscopy; Outcome: Paper 23.
- ▶ **Rosmarie Friemann, University of Gothenburg, Sweden.**
Membrane proteins and redox enzymes.
- ▶ **Christian Brix Follsted Andersen, Århus University, Denmark.**
Haptoglobin-haemoglobin and spectroscopy; Outcome: Paper 14.
- ▶ **Kara L. Bren, Rochester University, USA.**
Cytochrome c and Shewanella; Outcome: Paper 10 and 16.
- ▶ **Richard S. Magliozzo, Brooklyn College, New York, USA.**
Catalase-peroxidase; Outcome: Paper 17.
- ▶ **Volker Schünemann, University of Kaiserslautern, Germany.**
Mössbauer and nuclear resonance vibrational spectroscopy; Outcome: Paper 6, 11 and 18.
- ▶ **Ulf Ryde, Lund University, Sweden.**
Quantum chemistry; Outcome: Papers 4, 5, 8 and 9.

COURSES ATTENDED

- 2014 "Entering Leadership in Research" course held by the Mat.Nat. Faculty, University of Oslo consisting of 2 full-days and 8 half-days seminars over a 10 month period.
- 2016 National Academies Education Fellow in the Life Sciences for attending the National Academies Northstar Summer Institute on Undergraduate Education in Biology at University of Minnesota

CENSOR ACTIVITIES

- 2010-Present Censor on master thesis University of Oslo and Norwegian University of Life Sciences.
In total: 23 thesis (UiO: 14 , NMBU: 9)

Member of PhD-evaluation committee: 2017: Bie Ekblad, University of Oslo

REVIEWING ACTIVITIES

Metallomics (RSC, UK), BBSRC (Biotechnology and Biological Sciences Research Council, UK), Journal of the American Chemical Society (ACS, USA)

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

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|--------------|----------------------------------|--------------|---|
| 1999-Present | Norwegian Chemical Society | 2016-Present | American Chemical Society |
| 2001-Present | Norwegian Biochemical Society | 2016-Present | Society of Biological Inorganic Chemistry |
| 2008-Present | Biochemical Society (UK) | 2018-Present | Protein Society |
| 2013-Present | European Crystallographic Assoc. | | |

LIST OF SCIENTIFIC PUBLICATIONS

26. M. Hammerstad, Å.K. Røhr & **H.-P. Hersleth***.
A research-inspired biochemistry laboratory module - Combining expression, purification, crystallisation, structure solving and characterisation of a flavodoxin-like protein. (2018). *Submitted*.
25. I. Gudim*, M. Hammerstad, M. Lofstad & **H.-P. Hersleth***.
Characterization of different flavodoxin reductase-flavodoxin (FNR-Fld) interactions reveals an efficient FNR-Fld redox pair and identifies a novel FNR subclass.
Biochemistry (2018), 57, 5427-5436.
24. I.K. Olsbu*, G. Zoppellaro, K.K. Andersson, J.-L. Boucher & **H.-P. Hersleth***.
Importance of Val567 on heme environment and substrate recognition of neuronal nitric oxide synthase.
FEBS Open Bio (2018), 8, 1553-1566.
23. I. Gudim, M. Lofstad, W. van Beek & **H.-P. Hersleth***.
High-resolution crystal structures reveal a mixture of conformers of the Gly61-Asp62 peptide bond in an oxidised flavodoxin from *Bacillus cereus*.
Prot. Sci. (2018), 27, 1439-1449. *Highlighted* "In this issue" *Prot. Sci.* 27, 1353 (2018).
22. I. Gudim, M. Lofstad, Hammerstad & **H.-P. Hersleth***.
Measurement of FNR-NrdI interaction by Microscale thermophoresis (MST).
BioProtoc. (2017), 7, e2223.
21. M. Lofstad, I. Gudim, M. Hammerstad, Å.K. Røhr & **H.-P. Hersleth***.
Activation of the Class Ib Ribonucleotide Reductase by a Flavodoxin Reductase in *Bacillus cereus*.
Biochemistry. (2016), 55, 4998-5001.
20. S. Skråmo, **H.-P. Hersleth***, M. Hammerstad, K.K. Andersson & Å.K. Røhr.
Cloning, expression, purification, crystallisation and preliminary X-Ray diffraction analysis of a ferredoxin/flavodoxin-NADP(H) oxidoreductase (Bc0385) from *Bacillus cereus*.
Acta Cryst. (2014), F70, 777-780.
19. M. Hammerstad, **H.-P. Hersleth***, A.B. Tomter, Å.K. Røhr & K.K. Andersson.
The Crystal Structure of *Bacillus cereus* Class Ib Ribonucleotide Reductase Di-iron NrdF in Complex with NrdI.
ACS Chem. Biol. (2014), 9, 526-437.
18. S. Rackwitz, I. Faus, M. Schmitz, H. Kelm, H.-J. Krüger, K.K. Andersson, **H.-P. Hersleth**, K. Achterhold, K. Schlage, H.-C. Wille, V. Schünemann & J.A. Wolny.
A New Sample Environment for Cryogenic Nuclear Resonance Scattering experiments on Single Crystals and Microsamples at P01, PETRA III.
Hyperfine Interactions (2014), 226, 673-678.
17. X. Zhao, **H.-P. Hersleth**, J. Zhu, K.K. Andersson & R.S. Magliozzo.
Access channel residues Ser315 and Asp137 in *Mycobacterium tuberculosis* catalase-peroxidase (KatG) control peroxidatic activation of the *pro*-drug isoniazid.
Chem. Commun. (2013), 49, 11650-11652.
16. M. Can, J. Krucinska, G. Zoppellaro, N.H. Andersen, J.E. Wedekin*, **H.-P. Hersleth***, K.K. Andersson*, & K.L. Bren*.
Structural characterization of *Nitrosomonas europaea* cytochrome *c*₅₅₂ variants with marked differences in electronic structure.
ChemBioChem. (2013), 14, 1828-1838.
15. A.B. Tomter, G. Zoppellaro, N.H. Andersen, **H.-P. Hersleth**, M. Hammerstad, Å.K. Røhr, G.K. Sandvik, K.R. Strand, G.E. Nilsson, C.B. Bell III, A.-L. Barra, E. Blasco, L. Le Pape, E.I. Solomon & K.K. Andersson.
Ribonucleotide reductase class I with different radical generating clusters.
Coord. Chem. Rev. (2013), 257, 3-26 REVIEW.
14. C.B.F. Andersen, M. Torvund-Jensen, M.J. Nielsen, C.L. Pinto de Oliveira, **H.-P. Hersleth**, N.H. Andersen, J.S. Pedersen, G.R. Andersen & S.K. Moestrup.
Structure of the haptoglobin-haemoglobin complex.
Nature (2012), 489, 456-459.

13. **H.-P. Hersleth*** & K.K. Andersson*.
How different oxidation states of crystalline myoglobin are influenced by X-rays. Special issue: Protein Structure and Function in the Crystalline State: from X-ray to Spectroscopy.
Biochim. Biophys. Acta, Proteins Proteomics (2011), 1814, 785-796.
12. Å.K. Røhr, **H.-P. Hersleth** & K.K. Andersson.
Tracking Flavin Conformations in Protein Crystal Structures with Raman Spectroscopy and QM/MM Calculations.
Angew. Chem. Int. Ed. (2010), 49, 2324-2327.
11. K. Muffler, J.A. Wolny, **H.-P. Hersleth**, K.K. Andersson, K. Achterhold, R. Ruffer & V. Schünemann.
Installation of an IR/Raman measuring station at the ESRF for simultaneous detection of vibrational and nuclear resonant scattering spectra.
J. Phys.: Conf. Ser. (2010), 217, 012004, 4pp.
10. G. Zoppellaro, K.L. Bren, A.A. Esign, E. Harbitz, R. Kaur, **H.-P. Hersleth**, U. Ryde, L. Hederstedt & K.K. Andersson.
Studies of Ferric Proteins with Highly Anisotropic/Highly Axial Low Spin (S=1/2) Electron Paramagnetic Resonance Signals with Bis-Histidine and Histidine-Methionine Axial Iron Coordination.
Biopolymers (2009), 91, 1064-1082 REVIEW.
9. **H.-P. Hersleth**, Y.-W. Hsiao, U. Ryde, C.H. Görbitz & K.K. Andersson.
The Influence of X-Rays on the Structural Studies of Peroxide-Derived Myoglobin Intermediates.
Chem. Biodiv. (2008), 5, 2067-2089 REVIEW.
8. **H.-P. Hersleth**, Y.-W. Hsiao, U. Ryde, C.H. Görbitz & K.K. Andersson.
The crystal structure of peroxymyoglobin generated through cryoradiolytic reduction of myoglobin compound III during data collection.
Biochem. J. (2008), 412, 257-264.
7. **H.-P. Hersleth**, A. Varnier, E. Harbitz, Å.K. Røhr, P.P. Schmidt, M. Sørli, F.H. Cederkvist, S. Marchal, A.C.F. Gorren, B. Mayer, T. Uchida, V. Schünemann, T. Kitagawa, A.X. Trautwein, T. Shimizu, R. Lange, C.H. Görbitz & K.K. Andersson.
Reactive complexes in myoglobin and nitric oxide synthase.
Inorg. Chim. Acta (2008), 361, 831-843 REVIEW.
6. **H.-P. Hersleth**, T. Uchida, Å.K. Røhr, T. Teschner, V. Schünemann, T. Kitagawa, A.X. Trautwein, C.H. Görbitz & K.K. Andersson.
Crystallographic and spectroscopical studies of peroxide-derived myoglobin compound II and Occurrence of protonated Fe^{IV}-O.
J. Biol. Chem. (2007), 280, 23372-23386.
5. **H.-P. Hersleth**, U. Ryde, P. Rydberg, C.H. Görbitz & K.K. Andersson.
Structures of the high-valent metal-ion haem-oxygen intermediates in peroxidases, oxygenases and catalases.
J. Inorg. Biochem. (2006), 100, 460-476 REVIEW.
4. K. Nilsson, **H.-P. Hersleth**, T.H. Rod, K.K. Andersson & U. Ryde.
The Protonation Status of Compound II in Myoglobin, Studied by a Combination of Experimental Data and Quantum Chemical Calculations: Quantum Refinement.
Biophys. J. (2004), 87, 3437-3447.
3. **H.-P. Hersleth**, B. Dalhus, C.H. Görbitz & K.K. Andersson.
An iron hydroxide moiety in the 1.35 Å resolution structure of hydrogen peroxide derived myoglobin compound II at pH 5.2.
J. Inorg. Biol. Chem. (2002), 7, 299-304.
2. C.H. Görbitz & **H.-P. Hersleth**.
Selective solvent inclusion as a tool for mapping molecular properties in crystal structures - a diethylstilbestrol example.
*Acta Cryst. B*56, (2000), 1094-1102.
1. C.H. Görbitz & **H.-P. Hersleth**.

On the inclusion of solvent molecules in the crystal structure of organic compounds.
*Acta Cryst. B*56, 526-534 (2000).

* Corresponding authors

SELECTED TALKS AT CONFERENCES

2017 19th International Symposium on Flavins and Flavoproteins, Groningen, Netherlands
2015 Swiss-Norwegian Beam Lines 20 years anniversary “SNBL – Planning for the next decade”,
2012 27th European Crystallography Meeting, Bergen, Norway
2011 XXII Congress and General Assembly of the International Union of Crystallography, Madrid, Spain.
2011 15th International Conference on Bioinorganic Chemistry, Vancouver, Canada.
2011 17th International Conference on Cytochrome P450, Manchester, United Kingdom.
2010 10th European Conference on Biological Inorganic Chemistry, Thessaloniki, Greece.
2008 8th International Peroxidase Symposium, Tampere, Finland..
In total 27 talks at Norwegian, Nordic, European and International Conferences *2000-Present*
In total 25 poster presentations at Norwegian, Nordic, European and International Conferences *2000-Present*

TEACHING RELATED CONFERENCES AND WORKSHOPS

2009 IYC Conference for Nordic Chemistry Teachers, 28th–29th October 2011, Stockholm, Sweden.
2015 Enhancing Molecular Bioscience Education, 30th–31st March 2015, Cambridge, UK.
2015 FEBS-IUBMB Oslo Workshop on Education in Molecular Life Sciences, 18th –19th September
2015, Oslo, Norway
2015 Nordic Chemistry Learning Conference 2015, 3rd–4th December 2015, Trondheim, Norway

OTHER ACTIVITIES

Organising the Norwegian Chemistry Olympiad high-school competition (Norwegian Chemical Society) since 2004.