

Angelo Frei

Ph.D.

Date of Birth: 15.09.1990

Nationality: Swiss

Dept. of Chemistry, Biochemistry
& Pharmaceutical Sciences

University of Bern

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Career Summary

Secured 1'028'130 CHF in
independent research funding

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16 publications (13 first &
8 corresponding author)

3 patents (h-index = 10)

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Expert in synthetic medicinal
inorganic and organic
chemistry, analytical
methodology, radiochemistry
and antibiotic development

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Spearheaded interdisciplinary
collaborations with groups in
the UK, France, Switzerland
Italy, Poland, South Africa,
USA, Canada, Uruguay,
Australia and Singapore

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Strong competency in
mentoring, supervising and
motivating students

Soft Skills Training

Communication Skills for Leaders
(2017, Rohner AG, Switzerland)

Leadership Skills for Leaders
(2016, Mettler Toledo, Switzerland)

Research Funding

SNSF Ambizione Grant 2021

Swiss National Science Foundation (952'380 CHF)

*Outsmarting the Bugs – Metal Complexes as New
Antimicrobial Strategies*

Early Postdoc.Mobility Fellowship 2018

Swiss National Science Foundation (75'750 CHF)

Key Research Experience

Research Associate 2020 - 2022

Imperial & King's College, United Kingdom

- Development of new chelators for novel radiometals towards clinical radiotheranostics

Postdoc 2018 - 2020

The University of Queensland, Australia

- Preparation of antibacterial metal-based compounds
- Synthesis of antibiotics, peptides and antifungals
- Experience in microbiological assays, protein-docking, click-chemistry and solid-phase peptide synthesis
- Initiation of collaborations with >20 research groups

Ph.D. - Research Stay 2015, 2016, 2017

University of the Free State, South Africa

- Three 1-month visits in the group of Prof. Andreas Roodt
- In-depth kinetic investigations of ¹³CO-labeled rhenium carbonyl reactions by NMR and UV/Vis
- Three collaborative publications and a patent application

Ph.D. Thesis 2014 – 2018

University of Zurich, Switzerland

- Development of synthetic platform for multifunctional cyclopentadiene ligands and complexes
- Proficiency in the handling of radioactive substances
- Interdisciplinary collaboration leading to joint publication
- Successful application for independent Postdoc funding (Early Postdoc.Mobility, Swiss National Foundation)

Master Thesis 2012 – 2013

University of Zurich, Switzerland

- Extensive laboratory experience in inorganic chemistry
- Development of new ruthenium-complexes for photodynamic therapy against cancer and bacteria
- First-author publication and patent application

Summer Research Internships 2011, 2012

University of Zurich, Switzerland

- Two-month project on synthesis of Aminoferrocene, leading to a co-first author publication and a patent app.
- One-month project on the scope of novel Pd(II) cross-coupling catalysts, which are now commercially available

Awards

CASB Symposium Poster Award
(2019, Brisbane, AUS)

ICBIC-19 Travel Award
(2019, Interlaken, CH)

SNF Early Postdoc.Mobility
Fellowship (2017, Zurich, CH)

Honorable Mention, Albert
Hofmann PhD Award
(2017, Zurich, CH)

CMSZH/PerkinElmer Travel Award
(2017, Zurich, CH)

NZ Institute of Chemistry ECR
Award (2016, Auckland, NZ)

AsBIC8 Travel Award
(2016, Auckland, NZ)

Swiss Chemical Society Travel
Award (2016, Zurich, CH)

J. Med. Chem. Highly Cited Article
Award (2014, Zurich, CH)

A. Werner Legat for a remarkable
GPA, Master Studies
(2014, Zurich, CH)

A. Werner Legat for a remarkable
GPA, Bachelor Studies
(2013, Zurich, CH)

Languages

German: native speaker
Rumantsch: native speaker
English: fluent
Italian: fluent
French: conv. Proficiency

Organisational Skills

Speaker Liaison
Pint of Science Festival
(2019, Brisbane, Australia)
Organization Committee
QLD Annual Chemistry Symposium
(2019, Brisbane, Australia)
Screening & Hit Validation Advisor for
the Community for Open
Antimicrobial Drug Discovery

Technical Skills

NMR, HPLC, radio-HPLC, ESI-MS, LC-MS,
ICP-MS, UV/Vis, IR, ligand-docking
(Schroedinger), kinetic simulation (Kintek),
Data analysis (Origin, Prism), Machine
Learning Applications (Knime, Python)
MIC-assays, Bacterial cell uptake assays,

Education

Ph.D. in Chemistry **2014 – 2018**

University of Zurich, Switzerland

Thesis: "Multi-functional Cyclopentadienyl Complexes for
Theranostic Applications"

Supervisor: Prof. Dr. Roger Alberto

M.Sc. in Chemistry **2012 – 2013**

University of Zurich, Switzerland

GPA: 5.50 / 6.00

Thesis: "Towards Red-Light Activated Ruthenium Photo-
sensitizers for Photodynamic Therapy"

Supervisor: Dr. Gilles Gasser

B.Sc in Chemistry **2009 – 2012**

University of Zurich, Switzerland

Major: Chemistry **GPA:** 4.90 / 6.00

Minor: Biochemistry **GPA:** 5.20 / 6.00

Teaching Experience

Supervision and teaching of undergraduate students in
individual research projects and group lab courses

Instruction of PhD and MSc-level students in
radiochemical work procedures

Mentoring of MSc-level and PhD Students on a day-to-
day basis

Teaching of chemistry exercise classes (20-25 students)

Management of lab-demonstrations for children

Selected Invited Scientific Talks

Invited Talk – ISBOMC21 **2021**

Virtual Symposium

"Outsmarting the Bugs – Metal Complexes as New
Antimicrobial Strategies"

Invited Seminar **2020**

Macquarie University, Sydney, Australia

"Metalloantibiotics, A New Weapon in the Fight against
Antimicrobial Resistance?"

ICBIC19 **2019**

Interlaken, Switzerland

"Light-activated Rhenium Complexes against Gram(+) and
Gram(-) bacteria"

OZOM12 **2019**

Melbourne, Australia

"Multifunctional Cyclopentadiene Ligands for Theranostic
Approaches with Re and ^{99m}Tc"

Publications

- 16 **A. Frei***, S. Ramu, G. J. Lowe, H. Dinh, L. Semenc, A. G. Elliott, J. Zuegg, A. Deckers, N. Jung, S. Braese, A. K. Cain, M. A. T. Blaskovich* "Platinum Cyclooctadiene Complexes with Activity against Gram-positive Bacteria" **ChemMedChem**, 2021 Front Cover DOI: 10.1002/cmdc.202100157
- 15 **A. Frei***, P. A. King, G. J. Lowe, A. K. Cain, F. L. Short, H. Dinh, A. G. Elliott, J. Zuegg, J. J. Wilson, M. A. T. Blaskovich* "Non-toxic Cobalt(III) Schiff Base Complexes with Broad Spectrum Antifungal Activity" **Chem. Eur. J.**, 2021 Inside Cover DOI: 10.1002/chem.202003545;
- 14 A. Notaro*, **A. Frei***, R. Rubbiani*, M. Jakubaszek, U. Basu, S. Koch, C. Mari, M. Dotou, O. Blacque, J. Gouyon, F. Bedioui, N. Rotthowe, R. F. Winter, B. Goud, S. Ferrari, M. Tharaud, M. Řezáčová, J. Humajová, P. Tomšík and G. Gasser, "A Ruthenium(II) Complex Containing a Redox-Active Semiquinonate Ligand as Potential Chemotherapeutic Agent: From Synthesis to In Vivo Studies". **J. Med. Chem.**, 2020, DOI: 10.1021/acs.jmedchem.0c00431;
- 13 **A. Frei***, "Metal Complexes, an Untapped Source of Antibiotic Potential?", **Antibiotics**, 2020, DOI: 10.3390/antibiotics9020090; (> 40 citations)
- 12 **A. Frei****, J. Zuegg*, A. G. Elliott, M. Baker, S. Braese, C. Brown, F. Chen, C. Dowson, G. Dujardin, N. Jung, P. A. King, A. M. Mansour, M. Massi, J. Moat, H. A. Mohamed, A. K. Renfrew, P. J. Rutledge, P. J. Sadler, M. H. Todd, C. E. Willans, J. J. Wilson, M. A. Cooper, and M. A. T. Blaskovich*, "Metal-complexes as a Promising Source for New Antibiotics". **Chem. Sci.**, 2020, Inside Cover DOI: 10.1039/C9SC06460E; (>90 citations)
- 11 **A. Frei***, M. Amado, M. C. Cooper, and M. A. T. Blaskovich*, "Light-activated Rhenium Complexes with Dual Mode of Action against Bacteria". **Chem. Eur. J.**, 2020 Inside Cover DOI: 10.1002/chem.201904689;
- 10 **A. Frei***, E. Fischer, B. C. Childs, J. P. Holland and R. Alberto, "Two is Better than One: Difunctional High-affinity PSMA Probes Based on a [CpM(CO)₃] (M = Re,^{99m}Tc) Scaffold", **Dalton Trans.** 2019, 48, 14600 – 14605. DOI: 10.1039/C9DT02506E;
- 9 R. Bolliger, **A. Frei**, H. Braband, G. Meola, B. Spingler and R. Alberto, "Chemistry at High Dilution: Dinuclear ^{99m}Tc Complexes". **Chem. Eur. J.** 2019, 25, 7101-7104. Hot Paper DOI: 10.1002/chem.201901161;
- 8 **A. Frei***, "Synthetic routes towards multifunctional cyclopentadienes". **Chem. Eur. J.** 2019, 25, 7074-7090. Selected as outstanding Review-type article & Recognized as top downloaded paper 2018-2019 DOI: 10.1002/chem.201900276;
- 7 **A. Frei***, B. Spingler, R. Alberto, "Multifunctional Cyclopentadienes as a Scaffold for Combinatorial Bioorganometallics in [(η⁵-C₅H₂R₁R₂R₃)M(CO)₃] (M=Re, ^{99m}Tc) Piano-Stool Complexes". **Chem. Eur. J.** 2018, 24, 10156-10164. VIP Article DOI: 10.1002/chem.201801271;
- 6 **A. Frei**, P. P. Mokolokolo, R. Bolliger, H. Braband, M. S. Tsosane, A. Brink, A. Roodt, R. Alberto, "Self-Assembled Multinuclear Complexes Incorporating ^{99m}Tc". **Chem. Eur. J.** 2018, 24, 10397-10402. Hot Paper DOI: 10.1002/chem.201800600;
- 5 P. P. Mokolokolo, **A. Frei**, M. S. Tsosane, D. V. Kama, M. Schuette-Smith, A. Brink, H. G. Visser, G. Meola, R. Alberto, and A. Roodt, "Nuclearity manipulation in Schiff-base fac-tricarbonyl complexes of Mn(I) and Re(I)". **Inorg. Chim. Acta** 2017, 471, 249-256. DOI: 10.1016/j.ica.2017.10.036;
- 4 J. P. Kraack, **A. Frei**, R. Alberto, and P. Hamm, "Ultrafast Vibrational Energy Transfer in Catalytic Monolayers at Solid-Liquid Interfaces". **J. Phys. Chem. Lett.** 2017, 8, 2489-2495. DOI: 10.1021/acs.jpcclett.7b01034;
- 3 **A. Frei**, D. Sidler, P. Mokolokolo, H. Braband, T. Fox, B. Spingler, A. Roodt, and R. Alberto, "Kinetics and Mechanism of CO Exchange in fac-[MBr₂(solvent)(CO)₃] (M = Re, ⁹⁹Tc)". **Inorg. Chem.** 2016, 55, 9352-9360. DOI: 10.1021/acs.inorgchem.6b01503;
- 2 **A. Frei***, R. Rubbiani*, S. Tubafard, O. Blacque, P. Anstaett, A. Felgenträger, T. Maisch, L. Spiccia, and G. Gasser, "Synthesis, Characterization, and Biological Evaluation of New Ru(II) Polypyridyl Photosensitizers for Photodynamic Therapy". **J. Med. Chem.** 2014, 57, 7280-7292. Highly Cited Article of 2014 DOI: 10.1021/jm500566f; (> 130 citations)
- 1 A. Leonidova*, T. Joshi*, D. Nipkow*, **A. Frei***, J.-E. Penner, S. Konatschnig, M. Patra, and G. Gasser, "An Environmentally Benign and Cost-Effective Synthesis of Aminoferrocene and Aminoruthenocene". **Organometallics** 2013, 32, 2037-2040. DOI: 10.1021/om400009g;

*corresponding author

**authors have contributed equally

Patents

- G. Gasser, **A. Frei**, R. Rubbiani, A. Notaro, *"Ruthenium Complexes bearing a Dioxolane Ligand as Anticancer Agents"* Eur. Pat. Appl. (2019), EP19305668.6 *prelim.*
- A. Roodt, R. Alberto, **A. Frei**, P. Mokolokolo, R. Bolliger, A. Brink, *"Multinuclear Complexes and their Preparation"* WO/2019/123409.
- G. Gasser, A. Leonidova, T. Joshi, D. Nipkow, **A. Frei**, J.-E. Penner, S. Konatschnig and M. Patra, *"Synthesis of Amino-substituted Metallocene Compounds"* Eur. Pat. Appl. (2013), EP13157319.8 *prelim.*