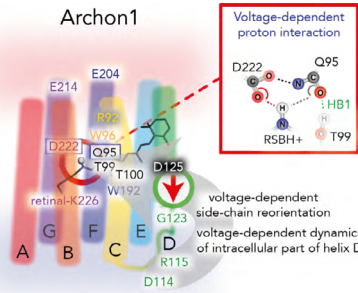


Newsletter

Winter 2022/23



Archon1

Voltage-dependent proton interaction

retinal-K226

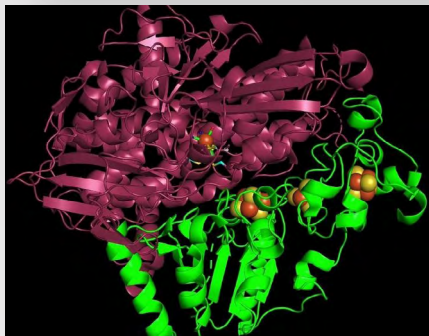
voltage-dependent side-chain reorientation

voltage-dependent dynamics of intracellular part of helix D

residues: E214, E204, W96, Q95, D222, T99, T100, W192, D125, G123, R115, D114, RSBH+, HB1, T99

Research Highlights

[Click here to take a brief look at what researchers at UniSysCat have been working on the past few months.](#)



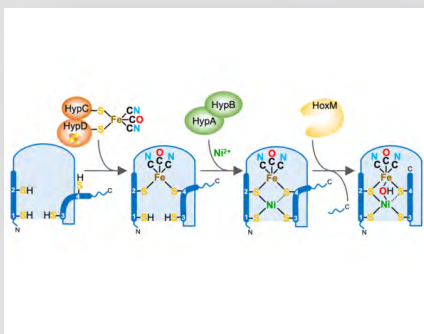
Current Affairs

[Click here to view the most recent events, awards and other affairs hosted by UniSysCat.](#)

Upcoming Events

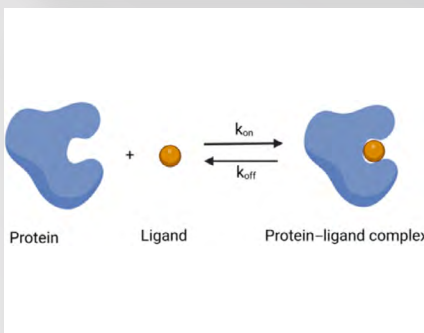
[Click here to take a look at the colloquia and other events coming up.](#)

Research Highlights



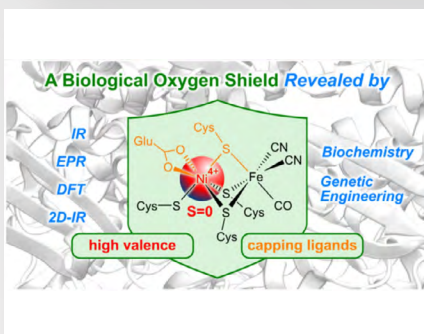
Stepwise assembly of the catalytic core of [NiFe]-hydrogenase

Four UniSysCat groups deciphered the multistep incorporation process of the catalytic NiFe(CN)₂(CO) cofactor into [NiFe]-hydrogenase, paving the way for chemical reconstitution of this biocatalyst.



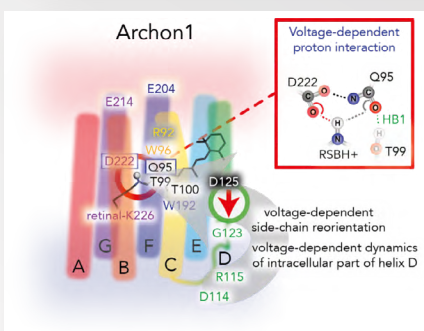
Advances in computational methods for ligand binding kinetics

Understanding how drugs bind to their target is very helpful for drug development. UniSysCat researchers Farzin Sohraby and Ariane Nunes Alves reviewed the latest computational methods for predicting the kinetics of binding mechanisms.



How a hydrogenase protects itself from oxygen

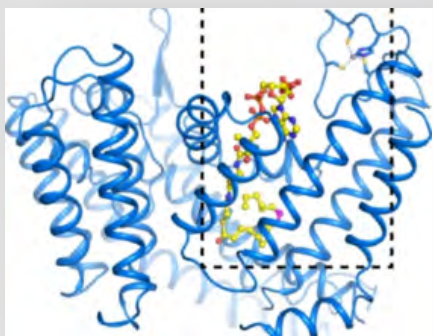
UniSysCat researchers reveal a unique mechanism by which an NAD⁺-reducing [NiFe] hydrogenase becomes more oxygen tolerant, which is of interest for hydrogen energy strategies and regenerating nucleotide cofactors.



New atomistic insights into fluorescent sensors for neuroscience

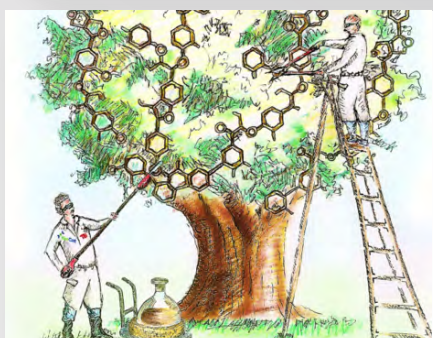
Neuroscientists are looking for accurate sensors to image nerve signals in tissue, particularly the brain. UniSysCat researchers now shed light on the voltage-sensing mechanism of the fluorescence of microbial rhodopsins.

Research Highlights



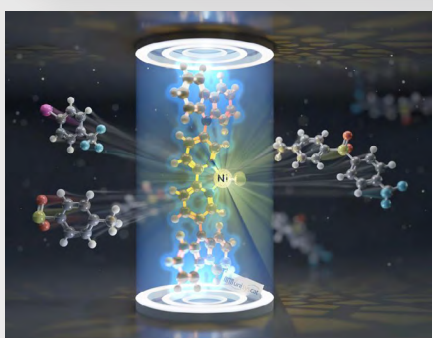
New insights into the mechanism of Wnt signalling

An international team including UniSysCat researcher Nadia Elghobashi-Meinhardt elucidated the mechanism & inhibition of Wnt acylation mediated by the enzyme PORCN - a process comprising an important signalling pathway in our body.



Lignin biorefinery to valuable chemicals

A team of UniSysCat researchers reviewed the development of technologies for the catalytic valorization of lignin, a natural plant material, to valuable chemicals in biorefineries.



A recyclable heterogeneous catalyst for light-mediated cross-couplings

Unifying nickel and photocatalysis - A team of six UniSysCat groups discovered a promising recyclable catalyst for cross-couplings by combining a nickel catalyst and a photocatalyst in a single material.

Current Affairs



New Video: Optogenetics - Visiting the lab of Prof. Peter Hegemann

Optogenetics is a technology that can be used to control the activity of cells - also nerve cells in the brain - by using light. In the video, Peter Hegemann and Alina Pushkarev report on their research. Hegemann is a member of the two clusters of excellence UniSysCat and NeuroCure.



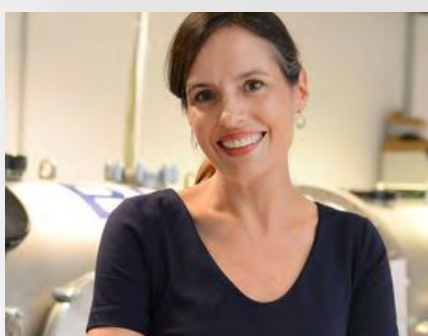
Now on YouTube: Energiesicherheit im postfossilen Zeitalter

This is the recording of the panel discussion held on 9 November 2022 as part of the Berlin Science Week. The energy expert Prof. Dr. Anke Weidlich, the chemist Prof. Dr. Matthias Drieß and the technology historian Dr. Benjamin Steininger discussed the topic.



Interview: With Chemistry against climate crisis: „We need new materials & processes“

UniSysCat researcher Maria Andrea Mroginski is convinced: catalysts have enormous potential in the fight against the climate crisis. Elena Matera asked her about her research on catalysts for sustainable energy production.



Serena DeBeer becomes new member of UniSysCat's SAB

We welcome Prof. Dr. Serena DeBeer from the Max Planck Institute for Chemical Energy Conversion as a new member of our Scientific Advisory Board (SAB). We look forward to her scientific advice and the future collaboration.

Current Affairs



Five new episodes of “exzellent erklärt - Spitzenforschung für alle”

From brain research to dark matter - five new episodes of the podcast “exzellent erklärt” were released from November 2022 to January 2023.



How machine learning opened up new possibilities for chemistry and medicine

UniSysCat researcher Ariane Nunes Alves and her collaborators describe the boost of structure-activity prediction by machine learning methods in an editorial for a virtual issue in the Journal of Chemical Information and Modeling.



Dr. Nadia Elghobashi-Meinhardt becomes Assistant Professor at UCD

UniSysCat researcher Dr. Nadia Elghobashi-Meinhardt will join University College Dublin (UCD) in January 2023 as Assistant Professor and Ad Astra Fellow. Congratulations on this career step!



And the Clara Immerwahr Award winner is: Dr. Reshma Rao!

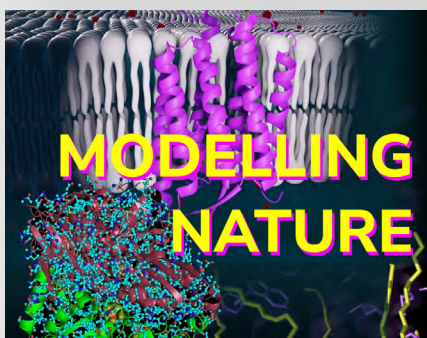
Since 2011, the Clara Immerwahr Award has received numerous high-profile applications from excellent young female scientists. This year, the award goes to Dr. Reshma Rao from Imperial College London for her outstanding research in the field of catalysis.

Current Affairs



Dr. Anastasia Kraskov receives Tiburtius Prize

For her dissertation, Dr. Anastasia Kraskov, member of the UniSysCat group of Prof. Peter Hildebrandt, is awarded with one of the Tiburtius Prizes of 2022.



New Video: Modelling Nature - How we learn from Biology

Researchers in UniSysCat try to understand the complex chemistry of nature. In addition to experiments in the laboratory, computer modelling plays an important role here. In this video you find four examples of biological molecules of great interest to UniSysCat's researchers.



Video: Photocatalytic production of hydrogen

Green hydrogen is an important sustainable energy storage medium. See here how a photocatalyst uses UV light for the production of hydrogen. One of UniSysCat's research goals is to develop photocatalysts that work with visible light.



Upcoming Events



UniSysCat colloquium

Dr. Janine George from the Bundesanstalt für Materialforschung und -prüfung (BAM) will talk about "Data-driven chemical understanding with geometrical and quantum-chemical bonding analysis".

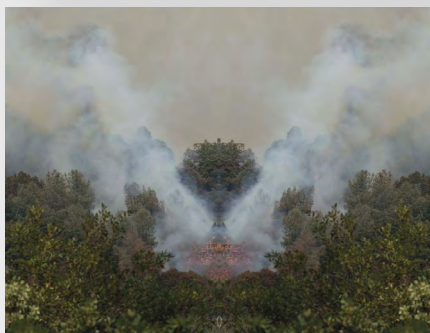
Date: 08.02.23, 5:15 pm, TU Berlin & online



UniSysCat colloquium

Prof. Dr. Charlotte Vogt from the Technion - Israel Institute of Technology will give a talk about "Operando Electrochemical FT-IR and quick-XAS Spectroscopy of Electrocatalytic Reactions for the Energy Transition".

Date: 01.03.23, 5:15 pm, TU Berlin & online



UniSysCat - Special - Colloquium

PD Dr. Jens Soentgen and Julius von Bismarck from the University of Augsburg will talk about "Farewell to Fire?". The evening will combine reflections from philosophy, chemistry, cultural history, and art.

Date: 02.03.23, 5:15 pm, TU Berlin & online



Imprint

Cluster of Excellence "Unifying Systems in Catalysis" (UniSysCat)
Technische Universität Berlin

Sekr. BEL 4
Straße des 17. Juni 135
10623 BERLIN
GERMANY

Tel.: +49 (0)30 314-28 590
Fax: +49 (0)30 314-28 594
E-mail: info@unisyscat.de

Spokesperson: Prof. Dr. Arne Thomas (TU Berlin)
Website: www.unisyscat.de

If you wish to unsubscribe this newsletter, please send an e-mail to
pr@unisyscat.de.