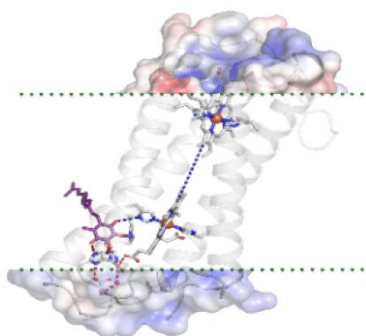


# Föredrag hösten 2024

## Biokemi



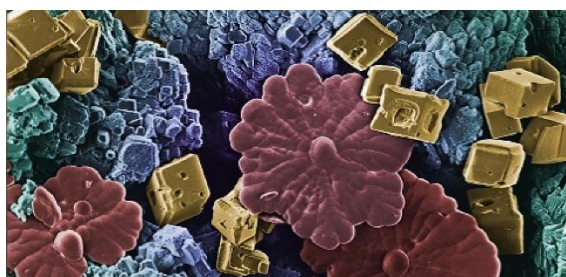
<b>B1 Andas! – protonöverföring i cellandningen (svenska)</b>	Denna presentation handlar om hur cellandningen fungerar. Vi tittar närmare på den molekylära mekanismen för protontransport genom enzymkomplex I och hur den kan undersökas med hjälp av beräkningskemi.
<b>B2 Photosynthesis and Quantum chemistry - From Light to Energy (engelska)</b>	Photosynthesis produces oxygen and is therefore essential to us humans. This talk will discuss how the molecular details of a key player in photosynthesis - photosystem II - can be studied using computational techniques.
<b>B3 Have you ever wondered how DNA is organised in a nucleus that is a fraction of its size? (engelska)</b>	Chromatin, which is a complex of DNA and protein found in eukaryotic cells, can be studied using fluorescence, using by a method called FRIC. My research focuses on heterochromatin, even though euchromatin is the "active" form of DNA. During this presentation I will show why this is useful and also explain how DNA is organized in its nucleus!
<b>B4 Feed your mitochondria! – from food to energy (engelska)</b>	Our bodies are composed of trillions of cells that carry out specialized functions essential for our survival. But, how are they able to do this? Where does the energy to carry out these functions come from? Here is where mitochondria come into scene! These are small organelles inside the cells that are capable of transforming the nutrients from food to energy used in biological processes such as growth and movement. We will learn how this transformation is done and energy obtained.
<b>B5 From molecules in water to microbes (engelska)</b>	My research is about finding out if chemicals/pollutants in water affect how antibiotic resistance is spread. To be precise, we are trying to find out if chemicals in environmental waters are triggering the SOS response in bacteria.

## Biogeokemi/Miljökemi

<b>G1</b>	<b>Kan metaller från den gröna omställningen påverka miljön och människor? (svenska)</b> Vi vet väldigt lite om miljökemien hos de metaller som används i teknik för ett klimatsmart grönt samhälle. I min presentation pratar jag om hur kemi i naturen påverkar dessa metaller, hur de kan spridas till våra grundvatten och våra dricksvatten, samt om hur lite vi vet om deras toxicitet.
<b>G2</b>	<b>Geochemistry and long-term health (engelska)</b> Have you ever wondered if the water you drink and the food you eat will impact your health later in life? This project is focused on learning whether certain elements that we encounter daily can contribute to diseases such as Alzheimer's, Parkinson's disease, and Multiple sclerosis.
<b>G3</b>	<b>How can uranium from mining be controlled? (engelska)</b> Uranium is an element found everywhere on the earth's crust. It is present in rivers and lakes at concentrations that do not affect our health. However, human activities can release high concentrations into the environment. In this presentation we will focus on the uranium released into the environment from mining.
<b>G4</b>	<b>Biogeochemical studies of the Arctic carbon cycle (engelska)</b> Besides directly measuring CO <sub>2</sub> emissions, it is possible to investigate this question using chemical analyses of organic matter. In this presentation I will focus on how several approaches, based on chemical analysis of organic matter, might increase our understanding of the changing Arctic carbon balance.
<b>G5</b>	<b>Climate change in the Arctic: Will a warmer Arctic emit more CO<sub>2</sub>? (engelska)</b> Besides directly measuring CO <sub>2</sub> emissions, it is possible to investigate this question using chemical analyses of organic matter. In this presentation I will focus on how several approaches, based on chemical analysis of organic matter, might increase our understanding of the changing Arctic carbon balance.
<b>G6</b>	<b>How do chemicals affect our health? (engelska/svenska)</b> Our environment contains a multitude of chemical compounds which humans can take up through several ways, e.g., eating, medication, air or water pollution. In my presentation, I will show you how we develop high-performance analytical methods to measure chemical levels in our blood to estimate the chemical burden of a person and their potential risk of future disease.
<b>G7</b>	<b>Exploring Mercury: from Land to Sea in the Baltic Coastline (engelska)</b> Let's discover Mercury, a shiny liquid silver metal, as it escapes from factories and natural spots, sneaks into the air and rivers, and finally dives into the Baltic Sea! Together, we will uncover the secrets of how mercury moves through our environment, its impact on sea wildlife, and what it means for us humans.
<b>G8</b>	<b>Acid Mine Drainage: The Hidden Hazard (engelska)</b> Water pollution happens when harmful substances enter water bodies like rivers, lakes and oceans. One serious type of water pollution is acid mine drainage. This occurs when rainwater flows through old mines or rock piles which are stored inappropriately. This polluted water is acidic and unsafe for consumption. It can harm fish and other

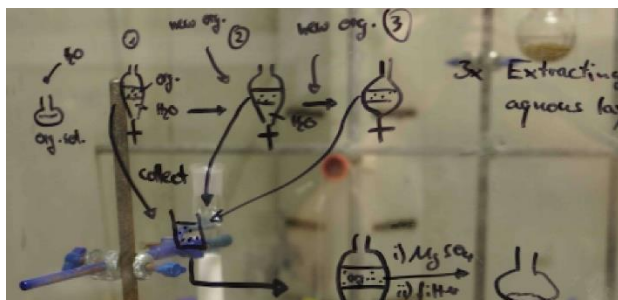
wildlife. I will talk about the chemistry behind acid mine drainage and what we can do to prevent this from happening.

## Materialkemi



<b>M1</b>	<b>Laboratory in your pocket: from clinical diagnostics to environmental control (engelska)</b> <p>Can you imagine controlling your health by eating a candy or using a DVD? Can a speleologist measure the water composition hundreds of meters deep with a piece of paper? Can a farmer control the quality of water and soil with the help of a coffee maker? If you are curious about all these questions, in this talk, you will learn how the new generation of wearables and portable analytical devices can help make the impossible possible.</p>
<b>M2</b>	<b>ZTH - Elektronlampknapp: atomiska magneter (svenska)</b> <p>I takt med att den tekniska utvecklingen går mot en allt mindre skala utvecklas material med väldigt speciella egenskaper. Datalagring och sensorer är exempel på applikationer där det finns två distinkta tillstånd, av och på. En lösning till detta kan vara att använda spinnväxlingsmaterial, där elektronerna kan hoppa kontrollerat mellan ett högre och lägre energitillstånd. I ett läge är materialet en magnet, i det andra är det inte det. Knappen är på eller av.</p>
<b>M3</b>	<b>Unravelling the world of plastics (engelska)</b> <p>The main purpose is to dispel many myths linked to the world of plastics thanks to a scientific perspective. What are plastics and polymers and how are they produced? Speaking of the environment and recycling, what is the current state of health of our planet? What progresses have been made in recent years and what are the critical issues? And what does the future hold for us?</p>
<b>M4</b>	<b>Development and Application of Quantum refinement for time-resolved crystallography (engelska)</b> <p>My research is about refining and modelling protein structures and elucidating their mechanisms computationally.</p>
<b>M5</b>	<b>Salty chemistry – an investigation of (un)familiar electrolyte solutions (engelska)</b> <p>With my research, I aim to address the confusion caused by the “controversial” experimental results using molecular simulations, theoretical methods, and experimental methods using a model charged clay particle system.</p>

## Organisk kemi



**O1 Using old tricks to start a Green Revolution in Synthetic Organic Chemistry (engelska)**

Organic synthesis drives our society with life-saving medicines and crop-boosting fertilizers. But the climate crisis demands action. With a growing population, our strain on our resources is growing ever larger, thus as synthetic organic chemists, we hold the key to change.

**O2 Predicting reaction mechanisms with computers (engelska)**

Reaction mechanisms determine many of the interesting parts of chemistry, such as reaction rates and product selectivity. Unfortunately, deciphering these mechanisms through experiments remains costly and challenging. With the advent of modern computer software, we can now elaborate on reaction mechanisms much easier. In this talk, I will present the field of computational chemistry and showcase a demonstration of something relevant to the class to show its power.

**O3 Stabilisering och reaktivitet av en tyngre N<sub>2</sub>-analog (svenska)**

Hur kan man använda metallorganisk kemi för att stabilisera en molekyl som normalt sätt bara finns i rymden med väldigt kort livstid. Kan struktur- och reaktivitetsstudier leda till utveckling av nya kemiska föreningar?