

## Wallenberg Academy Fellows 2013

Thirty-three new Wallenberg Academy Fellows have now been appointed. The five-year grant, amounting to between SEK 5 million and 9 million per researcher, provides long-term funding for young, promising Swedish and foreign researchers from all academic

### HUMANITIES

Oleay Yalcin



**PhD Axel Englund, Södertörn University, nominated by Stockholm University.**

***What role does music play in modernist poetry?***

Music has an important role as metaphor in poetry from the modernist movement. Axel Englund will explore how modernist contemporaries conceived of music as a phenomenon and how three of modernism's most significant poets used music in their work.

Sue Graham



**PhD Angus Graham, University College London, nominated by Uppsala University.**

***Reconstruction of the Egyptians' ancient canal system***

In Egyptian tombs, there are scenes showing temples and palaces with large water basins in front them, which were connected to the Nile via canals. Angus Graham will reconstruct the ancient aquatic system around Luxor, and investigate how the channels were used and what impact they had on ancient Egyptian culture.

Oleay Yalcin



**Associate professor Amanda Lagerkvist, Södertörn University, nominated by Stockholm University.**

***Existential questions in a digital world***

The internet has become an arena for processing grief and for meeting death. When a young woman was murdered by teenagers in Stureby, a suburb of Stockholm, in 2009, a wave of public online grief followed. Amanda Lagerkvist will explore how we seek and express existential questions in a digital world.

### MEDICINE

Ulf Ströborn



**PhD Christian Göritz, Karolinska Institutet, nominated by Karolinska Institutet.**

***Spinal-cord injury scars block healing***

When nerve cells in the brain or the spinal cord are damaged, the injury often becomes permanent. One reason is that scar tissue forms, which blocks the nerve cells from healing. Christian Göritz wants to find out if scar formation can be manipulated, in order to give the body a chance to repair important nerve pathways.



2013-11-29



**PhD Linda Holmfeldt, St. Jude Children's Research Hospital,  
nominated by Uppsala University.**

***Her vision is new remedies for blood cancer***

Many adults who suffer from the most common form of blood cancer, acute myeloid leukemia, do not respond to treatment or they experience a relapse post-treatment. Linda Holmfeldt will examine blood cancer cells to find any hidden weak points where they can be attacked by new drugs.



Stefan Zimmerman

**Professor Erik Ingelsson, Uppsala University,  
nominated by Uppsala University.**

***Individualized treatments for heart disease***

Coronary heart disease is the most common cause of death. In the developed world, such problems have declined. However, in developing countries, an increasing number of people die due to heart attack. In a large-scale project, Erik Ingelsson will try to find new ways of treating heart disease.



Daniel Jigenstedt

**PhD Francois Lallemand, Karolinska Institutet,  
nominated by Karolinska Institutet.**

***How is the network of nerve cells shaped?***

Long threads of nerves reach lengthwise and across our bodies. These nerves coordinate locomotion. Francois Lallemand will map what controls the formation of this intricate network. For example, how do the right bundles of nerves find each other during development?

**PhD Ola Larsson, Karolinska Institutet,  
nominated by Karolinska Institutet.**

***A key to the unlimited growth of cancer cells***

One cause of the uncontrolled growth of cancer cells is that the wrong kinds of proteins are produced: proteins that make the cells divide far too often. Ola Larsson's aim is to understand the basics of why these faulty proteins are generated.



**PhD Sjoerd Wanrooij, Washington University School of Medicine,  
nominated by Umeå University.**

***The energy power plant of the cell can explain aging***

A small part of all human genes are localized in the mitochondria, the energy power plant of the cell. Scientists know less about how the mitochondrial DNA works, but damage to it has been linked to aging and disease. Sjoerd Wanrooij will chart this blank spot on the map of biological knowledge.



2013-11-29



**PhD Joan Yuan, National Institutes of Health,  
nominated by Lund University.**

***Reducing infections after bone marrow transplants***

Bone marrow transplants save lives of people suffering from cancer, blood diseases and immunodeficiency diseases. But transplanted cells lack the ability to form all the white blood cells that an adult needs, resulting in susceptibility to infections. As a Wallenberg Academy Fellow, Joan Yuan hopes to solve this problem.



Markus Marcellic

**Professor Henrik Zetterberg, University of Gothenburg,  
nominated by University of Gothenburg.**

***Is Alzheimer's dementia caused by inflammation in the brain?***

Pharmaceutical companies have invested billions of dollars to develop medicines that can slow down Alzheimer's disease, but without success. Henrik Zetterberg will explore a new hypothesis as to why older people get dementia.

## NATURAL SCIENCES



**PhD Petter Brändén, KTH Royal Institute of Technology,  
nominated by KTH Royal Institute of Technology.**

***The zeroes that have solved many problems***

Polynomials have been central to mathematics since the days of antiquity. Petter Brändén has developed a new theory for understanding the relationship between the zeros of a polynomial (where the function equals zero) and the coefficients. This theory has already proven useful within widely different mathematical disciplines.



**PhD Charlie Cornwallis, Lund University,  
nominated by Lund University.**

***Why do we form societies?***

Evolutionary theory has a hard time explaining the development of societies where individuals might sacrifice themselves for somebody to whom they are not even related. Charlie Cornwallis will explore various explanations as to how this form of unselfish behaviour can arise and why societies sometimes break down.



Sean McNamara

**PhD Rachel Foster, Max Planck Institute for Marine Microbiology,  
nominated by Stockholm University.**

***A symbiotic relationship in the oceans***

The majority of algae living in the oceans consist of diatoms. They thrive and can "bloom" thanks to cyanobacteria that help them to capture nitrogen from the atmosphere. Rachel Foster studies this symbiotic relationship, that affects the cycles of both nitrogen and carbon.



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Falk Sieland



**PhD Christian Hedberg, Max Planck Institute for Molecular Physiology, nominated by Umeå University.**

***More effective drugs against severe infections***

When microorganisms infect the body, a molecular war arises between our cells and the intruders. As a Wallenberg Academy Fellow, Christian Hedberg will closely study two such molecular battlefields, with the goal of developing drugs that can help the body win the fight.

Jim Peter Elfström



**Associate professor Mattias Jakobsson, Uppsala University, nominated by Uppsala University.**

***Mapping the evolutionary history of modern humans***

What makes us human? Mattias Jakobsson wants to answer that question as a Wallenberg Academy Fellow. He will explore human history primarily through large-scale genetic mapping of people from sub-Saharan Africa.

Keren Fedida



**PhD Markus Janson, Princeton University, nominated by Stockholm University.**

***He will hunt planets in the universe***

A dream of many scientists is to find life in other parts of the universe. As a Wallenberg Academy Fellow, Markus Janson will optimize the technology used to study so-called exoplanets, which lie outside of our own solar system. When we can investigate the atmospheres of Earth-like planets, we can also find out if they harbour life.

Jernej Stare



**Associate professor Lynn Kamerlin, Uppsala University, nominated by Uppsala University.**

***She wants to understand natural resistance***

Evolution can happen quickly. Bacteria often become resistant against antibiotics, and cancer cells, against cytostatic drugs. Lynn Kamerlin will explore the natural development of resistance through studies of enzymes that break down man-made toxins called organophosphates.



**Associate professor Jonatan Klaminder, Umeå University, nominated by Umeå University.**

***Drug residues in watercourses affect the behaviour of fish***

Growing consumption of medicines combined with increasing populations means that residues of pharmaceuticals in sewage water constitutes a new, expanding group of pollutants in watercourses all over the world. Jonatan Klaminder will establish a research facility to enable study of how the behaviour of fish is affected by the chemical composition of water and also what impact such changes in behaviour could have on the ecosystem.



**PhD Martin Ott, Stockholm University, nominated by Stockholm University.**

***A molecular masterpiece within cells***

When you breathe, oxygen ends up in the cellular power plant: the mitochondria. This is where cells produce energy-rich molecules that support the living machinery. Martin Ott will study how one of the incredible protein complexes of the mitochondria are formed – a molecular artwork beyond compare.



**Professor Janine Splettstößer, RWTH Aachen University, nominated by Chalmers University of Technology.**

***She wants to control single electrons***

We have gotten used to our smart devices becoming increasingly powerful very rapidly. If computer technology continues to develop at the same speed, scientists will have to learn how to harness the forces of quantum mechanics. Janine Splettstößer wants to control single electrons, in order to get them to carry information in computers of the future.

FotoCenter Berlin



**PhD Sara Strandberg, Stockholm University, nominated by Stockholm University.**

***Could supersymmetry explain dark matter?***

Physics describes the world with the “Standard Model”, in which 12 elementary particles build all matter. However, this theory has its limitations and cannot explain, for example, the so-called dark matter that makes up most of the universe. Sara Strandberg wants to clarify how the Standard Model can be expanded to better describe our universe.

Jonas Strandberg



**PhD Sebastian Westenhoff, University of Gothenburg, nominated by University of Gothenburg.**

***A new tool for studying the chemistry of life***

In essence, all chemistry going on in a living organism is coordinated by enzymes, proteins that control and increase the speed of vital reactions. Sebastian Westenhoff is developing a new tool that uses extremely rapid laser pulses to get insights into how enzymes function at an atomic level.

Anna Thorbjörnsson



## SOCIAL SCIENCE



**PhD Anna Dreber Almenberg, Stockholm School of Economics, nominated by Stockholm School of Economics.**

### ***Do sex hormones impact our economic decisions?***

Anna Dreber Almenberg will conduct a series of experiments where she will investigate how various sex hormones affect decision-making. Can they make us take more risks, or become more self-sacrificing or competitive? She also will explore how human cooperation is influenced by different conditions.



**PhD Staffan I. Lindberg, University of Gothenburg, nominated by University of Gothenburg.**

### ***What forms a democracy?***

Staffan Lindberg is a principal investigator of the global project "Varieties of Democracy". The aim of the project is to explain why a country develops into a democracy and what causes a transition between various forms of democracy. The project's researchers are now building a gigantic database, to enable a systematic investigation of those questions.

Johan Wingborg



**Associate professor Ann Towns, University West, nominated by University of Gothenburg.**

### ***What do women encounter in the diplomatic world?***

The number of female ambassadors has increased radically over the last few years. At the same time, the international sphere is controlled by masculine norms. Ann Towns will investigate how female diplomats experience their situation and what they do to refute current norms.



**Professor Joakim Westerlund, Lund University, nominated by Lund University.**

### ***More robust tools for economic analysis***

The amount of detailed data on individuals, companies and countries, about their economies and welfare, has increased drastically. This has strengthened the development of empirical research in national economics. Joakim Westerlund will rework some of the tools used to extract knowledge from this wealth of collected information.

Simon Fox

## ENGINEERING SCIENCES



**Associate professor Martin Andersson, Chalmers University of Technology, nominated by Chalmers University of Technology.**

### ***Implants will become more durable***

Worn-out hip joints can be replaced with implants, which enable people to continue to live active lives. The problem is that those implants seldom last for the rest of a lifetime. Martin Andersson will develop a synthetic bone material that is better integrated into the body and becomes a natural part of the skeleton.

J-O Yxell



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Ekaterina Medvedeva



**Associate professor My Hedhammar, Swedish University of Agricultural Sciences nominated by KTH Royal Institute of Technology.**

***Future substitute organs will grow on a spider silk***

Biologist My Hedhammar focuses her research on the strongest material in nature: spider silk. She has managed to produce a copy of spider silk – made by bacteria. Now, she will use this artificial spider web as a framework for cells that form new organs.



**Associate professor Albert Mihranyan, Uppsala University, nominated by Luleå University of Technology.**

***Cellulose based nanofilters for purification of blood***

Hepatitis C, HIV and autoimmune diseases can be treated today through blood filtration, where viruses and 'self-attacking' antibodies are removed. Albert Mihranyan will use nanofibers made of cellulose to build more efficient filters for such blood purification techniques. He will also develop nanomaterials that can replace cartilage and other soft tissue in the body.



**Associate professor Panagiotis Papadimitratos, KTH Royal Institute of Technology, nominated by KTH Royal Institute of Technology.**

***A guaranty against infringement of wireless systems***

Major security risks limit the development of wireless and smart technology. Companies do not trust that such systems can be protected from hackers. Panagiotis Papadimitratos will develop new security protocols for wireless technology that are sure to stop all forms of intrusion.



**Associate professor Philipp Schlatter, KTH Royal Institute of Technology, nominated by KTH Royal Institute of Technology.**

***A computer will simulate the turbulence around an airfoil***

So far, scientists have found it impossible to simulate the turbulent flow around an airplane or a car. They simply have not had enough computer power – until now. Philipp Schlatter will develop a virtual wind tunnel, so computers can guide the design of new fuel-efficient vehicles.

**More information about the researchers and the Wallenberg Academy Fellows career programme:**

[www.wallenbergacademyfellows.org](http://www.wallenbergacademyfellows.org)