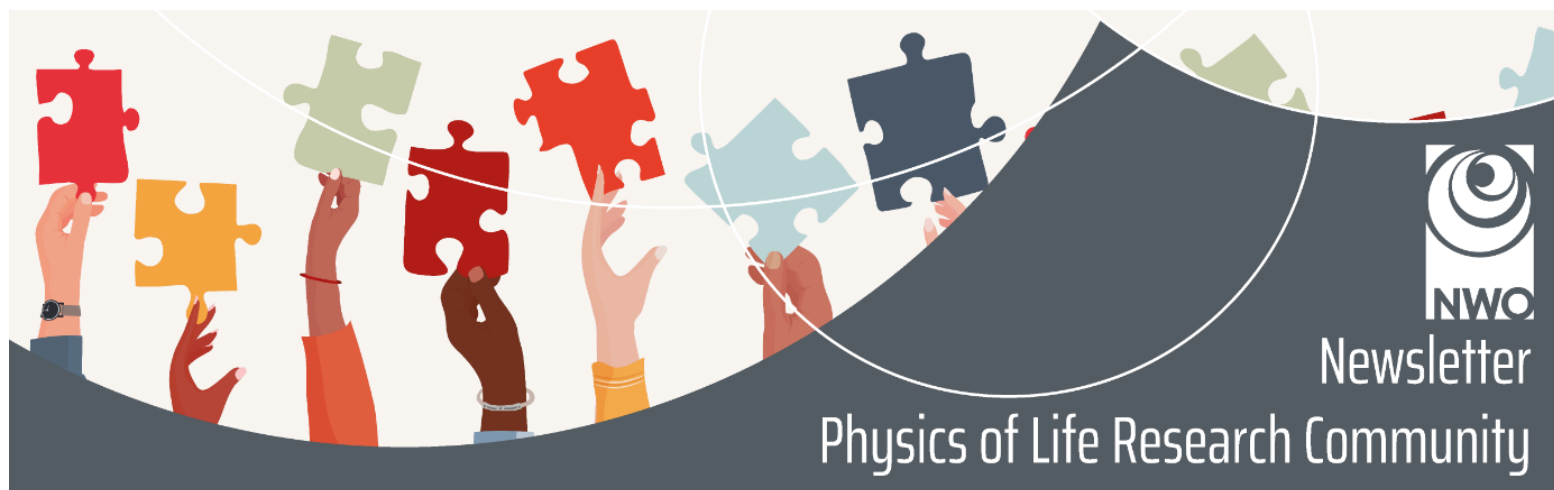




Newsletter [Physics of Life Research Community](#)

7 September 2023

It is our pleasure to present to you another newsletter of the [NWO Physics of Life Research Community](#). Besides our standard sections, such as granted projects and our PoL calendar, we also give more information about the upcoming PoL community meetings: the group leader session and the PoL seminar series. We are very happy to continue our forum function and represent you so that our opinions and experiences are optimally incorporated into NWO's policies and funding schemes. Do you have a suggestions to strengthen the field, want to reach out to other PoL researchers or do you have an idea for our newsletter? Contacts us by [email](#)! We are eager to hear about any suggestions you may have and we look forward to meet you this fall at our assemblies.

Best regards,
on behalf of the PoL advisory committee,
Kristina Ganzinger (AMOLF) and Naomi Chrispijn (NWO, Dutch Research Council)



NWO Physics of Life advisory committee:

Chair: Dr. Kristina Ganzinger (AMOLF)

Vice-chair: Dr. Greg Stephens (VU)

Prof. Alessandra Cambi (RUMC)

Prof. Lukas Kapitein (UU)

Dr. Mattijs de Groot (LUMICKS)

Dr. Nicholas Kurniawan (TU/e)

Prof. Peter Peters (MU)

Dr. Sonja Schmid (WUR)

Dr. Rifka Vlijm (RUG)

Secretary: Dr. Naomi Chrispijn (NWO)



Annual PoL group leader meeting coming up!

Group leader session at NWO Biophysics (Monday 9 October 16:50 in the Baroniezaal)

During NWO Biophysics, the physics of life (PoL) advisory committee organises its yearly assembly for group leaders. The PoL advisory committee's mission is to represent the scientists in our field so that our opinions and experiences are optimally incorporated into NWO's policies and funding schemes. NWO and the PoL advisory committee will update you on our committee's role within NWO and our recent achievements. We will also use this session to look ahead to the upcoming year: what (policy-related) input requests do we, as PoL advisory committee, expect from NWO, and conversely, what do YOU as a community member need us to voice to them? We invite you to think with us on how we can best serve the PoL community! As usual, there will also be room to meet your colleagues in the PoL field, with a special emphasis on introducing new members.

more info: www.nwobiophysics.nl/pol

Introductions new group leader

During the groupleader session there will be special emphasis on introducing new groupleaders. If you are attending this session, you will be asked to introduce yourself. As some of you might not be available on 9 October to join us in Veldhoven, you can contact [Naomi](#), so we can include you in the introductions of new PIs.

Note: you have to be registered for NWO Biophysics to attend the PoL group leader session.

New: PoL seminar series

Are you also longing back to the high level scientific talks, the cosy environment and the networking opportunities from the KNAW Biophysics talks held in Amsterdam back in the days? Then we have good news for you! The PoL advisory committee has been able to arrange its continuation! We are happy to share that Marianne Bauer and Siddharth Deshpande volunteered to be in charge of the programme and NWO can (financially) support the organisation to help community building of the PoL research field.

More info will follow, so stay tuned!

News from the physics of life advisory committee

The PoL advisory committee meets twice a year to discuss (NWO-) policy related issues and find ways to strengthen the Dutch PoL research community. For example, over the last year the committee provided advice on the Open Competition Domain Science, Dutch memberships in international research infrastructures, and the physics discipline sketch. In terms of community building, we re-initiated the PoL seminar series (KNAW biophysics talks), and we take an active role in the monitoring of large research projects funded by NWO. During our May meeting, the project leader of the ENW-GROOT Project 'Organoids in time' Jeroen van Zon gave an overview of the progress that has been made up until the mid-term report and informed the committee about the future plans. Suggestions and ideas were shared to maximise the impact of the project. Connecting with running NWO projects has multiple aims, ranging from providing well-substantiated advice regarding NWO funding in general, sharing tips and tricks on e.g. management of a consortium, outreach etc. all in order to strengthen the Dutch PoL field. Within the ENW XL funding scheme, this role of the PoL committee is now implemented: the project leader has to identify a so-called external advisor that has also a link with a relevant advisory committee (i.e. PoL). This person will then have yearly contact with the PI and will update the advisory committee.

We made structural changes to our PoL website

Upon request and suggestions by PoL community members we have been able to make adjustments to our website! If you have additional suggestions, we are happy to hear about them, so we can explore the possibilities of implementing them.

 Newsletters	Check out the archive of newsletter on this page. Many PoL colleagues have introduced themselves over the last two years. You can read their biosketches in the newsletters.
 Advisory committee	Information about the members of the Advisory Committee PoL, who are representing the PoL community within NWO's advisory structure

 Projects	Overview of research projects funded by NWO within the field of PoL.
 Members	Curious who make up the community? You can browse through the open registree and might find future collaborators. If you are a member and you wish to add your details to this page we ask you to fill in a questionnaire. Note: due to GDPR regulations, you have to fill this in separately from your PoL community membership registration.
 Structure	Dazzled about how the advisory committee is embedded in the advisory structure of NWO? Have a look at this page and if you have any questions contact Naomi via ResearchCommunity-PoL@nwo.nl or come and talk to us during NWO Biophysics or the PoL seminars.
 Vacancies	Looking for a job in biophysics or want to advertise your vacancies? Fill out the data and we will include it on the online vacancy board.
 Calendar	Looking for an interesting conference or talks at local colloquium? Check out the calendar. Are you organising a meeting of interest for the PoL community and would you like to have it included in the PoL calendar? Submit the details here: https://nwobiophysics.nl/calendar

New appointments, grants, prizes, and other news

- Interview with Hans Geuze and Nalan Liv on their perspective on the EM field. Hans Geuze (86) was one of the first scientists to study live cells with an electron microscope. He was the founder of the UMC Utrecht's Centre for Electron Microscopy, where Nalan Liv (38) is working now. Like Geuze before her, she is pushing the boundaries of this discipline. NWO asked them how their field of research has changed in the last 50 years. [Read more >](#)
- Lukas Kapitein and Tassos Perrakis have been newly elected as Members of EMBO, an organization of leading researchers that promotes excellence in the life sciences in Europe and beyond. [Read more >](#)
- Researchers from the Hubrecht Institute received two research grants from the Dutch Cancer Society. The groups of Geert Kops and Ina Sonnen will use the grants to perform their fundamental research into the biology of cancer. [Read more >](#)
- Open Call for the Kavli Prize to nominate scientists whose basic research has fundamentally transformed the fields of astrophysics, nanoscience and neuroscience – the big, the small, and the complex. The prize consists of \$1 million awards in each of the three fields. Deadline: 1 October. [Read more >](#)
- Are you an enthusiastic mid-level and senior researchers who wants to know more about the ENW Open Competition ENW-M programme? Subscribe as a non-voting chair. NWO will launch a pilot project with non-voting chairs who will manage several assessment committees. To this end, NWO will create a pool consisting of circa 7 members who will act as non-voting chairs of the meetings of the cluster committees of the Open Competition ENW-M programme during a two-year period. [Read more >](#)
- The 'Kenniscoalitie' solicits the next cabinet to continue to invest in knowledge and innovation, as described in a published election commitment in the run-up to the upcoming parliamentary elections. The Knowledge Coalition - a partnership of parties in the Dutch research and innovation field - calls on politicians to stick to the ambition of spending 3% of GDP on research and innovation by 2030. Furthermore, there are calls for the continuation of the National Growth Fund, the

structuralization of the Fund for Research and Science (after 2030), to focus on an ambitious European research and innovation policy with an associated budget and to ensure better exchange and transfer of knowledge to society.

- The NWA-ORC round 2023 is only open to a subset themes of 9 (out of 25) routes. Please check out the Call for proposals carefully before preparing a proposal. In our opinion none of the themes seem to match well with the physics of life research community. [Read more >](#)
 - Perspectief round 2023/2024: NWO Domain AES invites researchers and users (companies, societal organisations) to jointly submit new, challenging research projects within the application-oriented and technical sciences that generate economic and social impact in thematic areas relevant to the Netherlands. [Read more >](#)
 - Call for nominations: the Ehrenfest-Afanassjewa thesis award is annually awarded by the Dutch Physics Council. The award recognizes an outstanding PhD thesis in the field of physics. Deadline 1 Oct [Read more >](#)
 - Call for nominations: the Minerva Prize is an annual award to outstanding young female or non-binary physicists in the Netherlands with an overall performance that scientifically excels in any subfield of physics. The Prize is a joint initiative of the Dutch Physics Council and the Netherlands' Physical Society (NNV). Deadline 1 Oct [Read more >](#)
 - Mazyar Jalaal (UvA) received an ERC Starting Grant for the project FluMAB: Understanding The Fluid Mechanics of Algal Bloom Across Scales.
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New colleagues

Every newsletter new colleagues in the field of Physics of Life are invited to introduce themselves to the community. Do you want to introduce yourself? Contact us via [email](#).

Tommaso Ristori (TU/e)

I am very happy to introduce myself to the Dutch Physics of Life community. I am a Tenure-Track Assistant Professor in the Biomedical Engineering Department of the Eindhoven University of Technology (TU/e, the Netherlands). I come from Italy, and I have been studying and researching abroad for the last 11 years. I am fascinated by the multilayered responses of cells to their environment, and passionate to discover new biophysical mechanisms in this context by combining mathematical and experimental techniques.



Although now working in Biomedical Engineering, I have an educational background in Mathematics. After receiving a joint MSc degree in Mathematics and Mathematical Engineering from the University of Florence (Italy) and the Universidad Complutense de Madrid (Spain), I have completed a PhD in Biomedical Engineering at the TU/e, with a thesis focused on the computational analysis of cell-mediated collagen remodelling. My PhD experience was followed by postdoctoral research in close collaboration with researchers from the TU/e and the Åbo Akademi (Turku, Finland), focused on simulating and unravelling the role that (mechanosensitive) cell-cell signalling has on arterial remodelling. A second postdoctoral experience at the Boston University (USA), supported by the NWO Rubicon and Marie Skłodowska-Curie Postdoctoral Fellowships, gave me the opportunity to complete my transition towards a more applied field by learning cell culture experiments, particularly focused on endothelial cells and sprouting angiogenesis.

I started my Assistant Professorship in March 2021. My current research interests lie at the intersection between computational modelling and regenerative medicine. My group integrates computational models with experiments to unravel the mechanisms of sprouting angiogenesis, to leverage them for the control of this biological process in time and space and thereby potentiate the development of related regenerative medicine strategies. Currently, our research focusses on the (mechanosensitive) cell signalling pathways regulating the spatiotemporal dynamics of endothelial cell identity selection.

Tip from the advisory committee PoL: check out his talk at NWO Biophysics 9 October 11:45

Bio sketches

We also give the floor to researchers already part of the PoL community for a longer time to write a biosketch. Do you want to introduce yourself? Contact us via [email](#).

Maïke Hansen (RU)

It is a pleasure to introduce myself to the Physics of Life Community. I am an assistant professor in the Biophysical Chemistry department at Radboud University and am fascinated by how cells, though immensely complex, can still function robustly and dynamically. Specifically, my research interests lie in understanding how (stochastic) gene expression drives divergent cellular behavior.



After obtaining my MSc in Chemical Biology from the University of Warwick (UK), I joined the group of Prof. Wilhelm Huck (Radboud University, NL). My PhD research focused on implementing microfluidics and biochemistry to generate synthetic “life-like” compartments capable of expressing genes. The goal was to understand how gene expression dynamics are altered if we manipulate physical properties of these “life-like” compartments.

Wanting to apply my theoretical and fundamental abilities to a more biomedical challenge, I became a Rubicon postdoctoral fellow in the lab of Leor Weinberger at Gladstone Institutes (UCSF) in San Francisco. My research focus switched to studying gene expression dynamics of viruses, specifically HIV. I was interested in understanding how HIV’s intricate network of feedback mechanisms allows for the virus to make different fate-decisions (i.e., continue to replicate or become latent).

In the beginning of 2020, I started my group in the Biophysical Chemistry department, where we leverage computational modeling, cell-free biochemistry, and quantitative single-cell biology to unravel the molecular processes that drive cell-fate decisions. Supported by an ERC Starting Grant and an NWO Vidi grant, we aim to determine which molecular processes within cells drive stochastic decision making, and how stochastic processes might be regulated by cells in order to generate controlled, or more deterministic, decision-making. We are particularly interested in gene expression regulation in the context of differentiation and development.

Alireza Mashaghi (LEI)

I am a physician-scientist interested in exploring innovative interdisciplinary solutions to medical challenges. In my research, I strive to bridge disciplines to bring about conceptual and methodological advances.

During my career as a molecular (bio)physicist, I contributed to single molecule biophysics through the development of circular scanning FCS for analysis of cellular protein dynamics (with Petra Schuille and Anthony Hyman, MPI CBG), optical tweezers analysis of protein folding (with Sander Tans, AMOLF), and combined magnetic tweezers and fluorescence analysis of DNA plectonemes (with Cees Dekker, TU Delft). Furthermore, I contributed to the field of membrane biophysics through the development of methodologies to study vibrational dynamics of membranes (with Mischa Bonn MPI PR and Huib Bakker, AMOLF), and label free membrane sensing approaches such as dual polarization interferometry (with Marcus Textor, ETH Zurich).

During my clinical trainings, I got interested in immune system dysfunction and performed numerous studies on autoimmunity, cancer immunity and transplantation immunity at various institutions including Dana Farber Cancer Institute and Massachusetts Ear and Eye of Harvard Medical School.

At Leiden, I have spearheaded the establishment of a Physics for Medicine initiative, through connecting Leiden Academic Centre for Drug Research with Leiden Institute of Physics and Leiden University Medical Centre.

My lab is interested in exploring how disordered proteins function, how they assemble and how their folding and assembly impacts cellular function in muscular dystrophy and cancer. A key invention of our lab is “circuit topology” a unique approach that enables topological analysis of disordered proteins. With regards to cellular function, we are focused on metabolism and mechanics. As such, we are working intensely on mechanobiology of immune cells, muscle cells, as well as metastatic cancer cells.

We have also been active in bridging virology and bioengineering, through the development of bioengineering approaches to fight viral diseases. In this context, we work closely with pharmaceutical industry for designing and testing new drug candidates.



Events, meetings, and workshops

Are you organising a meeting of interest for the POL community and would you like to have it included in this list? Submit your calendar item here to have it included in our online overview: <https://www.nwobiophysics.nl/calendar>

Name	When	What
Population Dynamics Seminars	Every ~3 weeks Fridays at 3:30pm	Series of virtual seminars on Population Dynamics and more broadly about Quantitative Biology, Computational Life Science, and Theoretical Biophysics.
Biological Physics & Physical Biology Seminar	Every Friday 5:00pm	The goal of the online series is to highlight interesting current research in biophysics, broadly defined.
NanoBioPhysX Club, WUR (NL)	Monthly	A monthly seminar series, covering fundamental interdisciplinary science at the nanoscale, hosted at Wageningen / WUR every last Wednesday of the month. Twitter: #NBPXclub -> Come for the science, stay for the drinks!
EMBO EMBL Symposium (DE): Seeing is believing: imaging the molecular processes of life	4-7 October 2023	The symposium will bring together the leading developers of imaging methods with cutting-edge applications that illustrate how imaging can answer biological questions.
NWO Biophysics (NL)	9-10 October 2023	The annual Dutch conference on physics of life.
Insight Out (2x online, 1x live)	2, 8, 16 November 2023	Biennial career and networking event for women in STEM
Workshop on STED super resolution microscopy (NL)	6-7 November 2023	Lectures, hands-on sample preparation, imaging and data analysis. Groningen. For info: r.vlijm@rug.nl
BSI Meeting (FR)	13-17 November 2023	Integrative structural biology meeting with talks on in the fields of viruses, microbes, machine learning, cell biology, drug design, cancer, neurons, methods, and plants.
Correlative Array Tomography Workshop 2023 (SE)	29 November - 1 December 2023	Workshop to explore this exciting new Volume EM technology, sample preparation & image analysis methods.
NWO Physics (NL)	23 – 24 January 2024	A large conference that provides a topical overview of physics in the Netherlands. Traditionally, young researchers are given the chance to present themselves and their work alongside renowned names from the Dutch and international physics community. Deadline abstracts for oral presentations: 8 September 2023
Forces across scales (Porto)	6-9 March 2024	The meeting focuses on mechanobiology, a multidisciplinary area of research that explores how mechanical forces interact with biological systems, influencing cellular behaviour, tissue development, and disease progression.
WomenNetPhysics (NL)	22 March 2024	The first women in physics conference in the Netherlands. This network event will gather all that are interested in the position of women in physics, ranging from different stages in their careers and research fields.
Instruct-ERIC Biennial Structural Biology Conference (PT)	22 - 24 May 2024	The IBSBC showcases the latest in integrative structural biology from leading scientists across the world.
Diversity and Evolution in Cell Biology (ES)	24 - 27 June 2024	This meeting aims to bring together evolutionary biologists and cell biologists investigating diverse aspects of cellular physiology, traversing both spatial scales and evolutionary time.

Projects granted by NWO



The projects listed are the projects granted by NWO that have a connection with Physics of Life. Please follow the links for full granting information.

Open Competition M

[Read more >](#)

The art of the first cut: elucidating the molecular mechanism of the signal peptidase complex

prof. dr. Friedrich Förster (UU)

Many proteins such as the protein hormone insulin and antibodies have 'zip codes' that ensure their correct delivery in the cell. Signal peptides constitute these zip codes, and they are removed from the proteins shortly after reaching their first destination, from which they are transported further. In this project we investigate how the enzyme that is responsible for the correct removal of the signal peptide works in atomic detail. This research is important to understand how essential proteins such as insulin are produced in a healthy cell, but also to obtain clues into how viruses hijack the enzyme for reproduction.

Understanding the master chaperone of our cells

dr. Sonja Schmid & dr. Kasia Tych (WUR/RUG)

Proteins constitute the molecular machines in our cells. However, many of them would be non-functional without the help of the cell's master chaperone, Hsp90, which turns them into functional entities. Surprisingly, despite this central role, we still don't understand how this Hsp90 actually works. We will therefore use new technology to elucidate the relevant small scale of individual molecules. We will test how Hsp90 is energetically powered, how it treats the other proteins, and how it coordinates its necessary helper proteins. Our research will provide a currently missing molecular-level understanding of Hsp90 and thus inform the development of cancer therapeutics.

Open Competition XS

[Read more >](#)

SmartComplete: an ultimate approach for analysing complete transcriptomes, from bulk samples to single cells.

Prof. dr. Eugene Berezikov (UMCG)

Next-generation sequencing of RNA is now an integral part of nearly every genetic study where gene expression levels are relevant. Yet methods to generate libraries for RNA sequencing still need improvements in sensitivity, transcriptome coverage and costs. Here we propose a new approach, SmartComplete, which can simultaneously analyse the complete transcriptome of a cell, including messenger RNAs, non-coding RNAs and short RNAs, in a single one-pot library preparation, and at greater sensitivity and a fraction of costs of commercial kits. Once fully optimized, SmartComplete is poised to become the method of choice for all RNA sequencing applications.

Cancer-associated fibroblast subtypes: who does what?

Prof. dr. Alessandra Cambi (RUMC)

Solid tumours hijack neighbouring healthy cells to create environments that help tumour growth and spreading. Fibroblasts are cells that are present in all our organs and can be manipulated by the tumour. We know that these cancer-associated fibroblasts come in many types: some produce collagen and facilitate tumour invasion, others secrete molecules that fool the immune system helping tumours to escape. We do not know, however, the specific functions of these different types of fibroblasts. Here, we will develop new, reproducible and standardized procedures to induce these different fibroblast types in the laboratory to better understand their role in cancer.

Is there a molecular connection between acute myeloid leukaemia and nuclear transport?

Prof. dr. ir. Patrick R. Onck (RUG)

Acute myeloid leukaemia (AML) accounts for approximately 80% of all cases of adult leukaemia, with poor success rates for current treatments. Recently, a wide proteomic screening showed a remarkably strong connection between AML and nuclear transport, leading to the hypothesis that deficiencies in nuclear transport may play an important role in leukaemia. In the proposed research we aim to collect convincing molecular evidence to confirm this hypothesis. When successful, this will not only trigger a new research direction, it will also open up an entirely new angle in the development of therapeutic strategies for AML.

Reducing immunogenicity through bioengineering of human donor heart valves.

Dr. Marijn C. Peters (TU/e)

Children with heart valve disorders risk the development of heart failure and require valve replacement with a cryopreserved donor valve. However, these are avital and cannot grow. Living donor valves would offer excellent outlooks for growth but face immune rejection. Recently, we have pioneered a gene-editing system to hide donor valves from immune rejection. Here, we will validate by using advanced techniques to characterise bioengineered donor valves in the presence of immune cells to mimic implantation. When successful, this new technology will have large implications for modern transplant technology.

and may prevent the use of immunosuppressants/anticoagulants and extensive animal testing.

Drop-on-Demand Solution for Improved Tissue Engineering.

Dr. Sarah C.M. Pragnere (TU/e)

Tissue engineering combines biology and engineering to reproduce organs in vitro. Bioprinting of cells in hydrogels is one of the methods to produce these in vitro organs. While most methods aim to create homogeneous cell suspension, we believe that heterogeneous cell repartition can help us recreate some aspects at the micrometer scale that traditional methods cannot. This could be used to reproduce the specific micro-architecture of different organs. To achieve this goal, we want to use a drop-on-demand system to precisely position the cells in 3D. If it succeeds, it will pave the way for a new tissue engineering method.

High resolution volumetric bioprinting of large tissue models.

Dr. Alexis Wolfel (UT)

Laboratory-made tissues and organs are re-shaping medicine: they are useful to understand diseases; can reduce the use experimental animals; and may facilitate scalable organ transplantations. However, while natural tissues possess intricate architectures throughout their entire bulk, current methods to produce engineered living tissues only allow for either large volumes at low resolution or high resolutions within small tissue volumes. This limitation hinders the use of engineered tissues. We propose to develop a beyond-state-of-the-art 3D-printing technology to bioprint tissues with unprecedented speed and resolution. This novel technology will thus uniquely offer ability to rapidly produce large tissues at high resolutions.

Can AI learn the laws of physics and chemistry in protein folding?

Dr. Li Xue (RUMC)

Self-supervised learning (SSL) algorithms, like chatGPT, can learn the grammar of natural languages without giving specific instructions. We will develop 3D-GPT, an SSL algorithm that learns the physical and chemical rules of protein folding from the analysis of three-dimensional (3D) protein structures. Specifically, we will explore the capability of 3D-GPT to model the energy for protein folding and use it to fold small therapeutic proteins. Like other SSL algorithms, once pretrained, 3D-GPT can be fine-tuned to solve a wide range of applications, for example, identifying disease-causing mutations, and aiding cancer vaccine design.

Veni 2022

[Read more >](#)

DNA-coated vesicles with time-varying adhesion to model cell migration

Dr. Pepijn G. Moerman, TU/e

To grow from a shapeless clump into an intact animal, cells must move by pushing each other out of the way. How strong the cells stick together plays an important role in this process, but it is unknown how exactly changes in their stickiness affect their movement. This research will produce an experimental model of fake cells with controllable stickiness to learn about the role of adhesion changes on cell motion. This insight may eventually help develop drugs that can prevent the spreading of cancer cells by targeting the cells' stickiness.

Inside the matrix: Modelling cell-matrix mechanics to predict cell migration modes in cancer metastasis

Dr. Eerika Tsingos, UU

Cancer is a significant healthcare challenge. Some cancers are benign, and can be cured by surgically removing the tumour. Others are malign, meaning that the cancer cells move away from the original tumour to make new tumours elsewhere in the body (metastasis). Once a tumour has spread, the chances of successful treatment worsen. This project will develop better computer models of how cells move inside tissues of the body to understand why some cancer cells sit still while others move, and how we can artificially bring them to a halt.

Vidi 2022

[Read more >](#)

Sense, Decide, Develop: how to maintain accuracy in gene regulation and development

Dr. Marianne S. Bauer, TUD

For organisms to develop well, cell-fate decisions need to be made correctly, and these in turn are based on an accurate sense of the cell's environment. Researchers will investigate mechanistic processes which contribute to noise, regarding the spatial structure of the genome, on the one hand, and develop information-theoretical and mathematic frameworks to infer optimal network architectures from experimental data on the other. This project is based on experimental collaborations in a series of developing systems, from flies to viruses.

How do cells turn their noise up or down?

Dr. Maïke M.K. Hansen, RU

Cells in our body can be seen as a mini-factory, where there is an assembly line that creates proteins as a final product. The amount of protein each cell makes can vary drastically between even genetically identical cells, this is called noise. Individual steps in this assembly can turn up or down the protein noise. For instance, increasing noise is a phenomenon associated with antibiotic resistance in bacteria or diseases such as HIV and cancer. This project determines how cells can regulate noise, which will improve the understanding of how defects in noise-regulation can result in disease.

A toolbox for epigenetic research

Dr. Danny D. Sahtoe, Hubrecht Institute

Proteins that package and protect our hereditary information (DNA) are often carefully arranged in 3D space within the cell nucleus and also modified by chemical groups. Together, these processes determine which genes are switched "on" and "off". This proposal describes how synthetic proteins, that will be designed on a computer, will help to unravel how genes are exactly turned "on" and "off".

Tip from the advisory committee PoL: check out his talk at NWO Biophysics: 10 Oct 10:30

Parallel session: Protein-protein interactions

Dutch Research Agenda – Research along routes by consortia (NWA-ORC)

[Read more >](#)

Criminal InvestigationDX - advanced diagnostics for criminal investigations based on innovative micro/nano technology

Official secretary on behalf of the consortium: dr. ir. M.L. Bennink (Saxion University of Applied Sciences)

Consortium: Saxion University of Applied Sciences, Ministry of Security and Justice, University of Twente, Wageningen University & Research, VU Amsterdam, Amsterdam UMC - location AMC, Nytor BV, Salvitat B.V., Beleef!Media, Benchmark, Center for Safety and Digitization (CVD), Public Prosecutor's Office (OM), National Police, Pervatech, Micronit BV, Novel-T, D Andrea&Evers.

To improve the efficiency and effectivity of tactical and forensic research, two novel innovative tools including working protocols are being developed, and implemented in the criminal justice system that empower the criminal investigator to rapidly acquire reliable information at the crime scene. The tools can determine whether a trace contains a sufficient amount of DNA for further analysis, or to extract more information from them, that can directly

HOLLAND HYBRID HEART, combining tissue engineering and soft robotics to build a biocompatible artificial heart that offers a future to heart failure patients

Official secretary on behalf of the consortium: prof. dr. J. Kluin (Erasmus MC)

Consortium: Erasmus MC, Eindhoven University of Technology, AMOLF, University of Twente, Saxion University of Applied Sciences Sustainable & Functional Textiles, Delft University of Technology, Maastricht University, Dutch Heart Foundation, Dutch Cardiovascular Alliance (DCVA), TrailBlazers, EE labels, Evos GmbH, Harteraad, Dutch Pulmonary Hypertension Association (PHA).

Worldwide, 23 million people suffer from heart failure. For advanced heart failure, heart transplantation is the gold standard. However, due to the limited availability of donor hearts, waiting lists are long and many patients die while on the waiting list. We are developing the Holland Hybrid Heart (HHH): the first functional artificial organ. The HHH is a soft robotic heart with an innerlining of the patient's own cells. Together, the HHH resembles the healthy human heart as

guide the investigation. Both tools will result in solving more cases in a shorter time, which directly contributes to the trust in criminal investigations and the sense of security of everybody.

closely as possible. This safe alternative to a donor heart is essential to offer a lifesaving solution for thousands of heart failure patients.



Contact

Dr. Naomi Chrispijn-Steenbeek, secretary of the advisory committee for the Physics of Life research community
NWO Utrecht, Winthontlaan 2, 3526 KV Utrecht

Do you have a news flash or research highlight interesting for the Dutch PoL community that you would like to add to the PoL newsletter? Send us an email.

Email: ResearchCommunity-PoL@nwo.nl

Website: nwobiophysics.nl/pol

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