

Jury Report For Women In Science Rising Talent Prizes 2022

The Royal Holland Society of Sciences and Humanities (KHMW) is delighted with the initiative of L'Oréal Netherlands and the Netherlands Commission for Unesco to encourage talented young female researchers in their pursuit of an academic research career. The KHMW was very pleased to engage with this initiative and accommodate the selection of nominations received for the For Women In Science Rising Talent Prizes, in the framework of the For Women In Science programme. Given the exceptional quality of nominations, and the number of nominations, 119 in total, the jury had a hard time selecting the prize winners. The jury was very much inspired by the abundance of up-and-coming talent among young female researchers in all corners of the life sciences and the physical sciences. With so much brilliance in the female research population, academia is definitely set to look different in the decades to come. All candidates show great promise for the future, in pushing the boundaries of our current knowledge and creating a better world.

First prize - Linda Al-Hassany, Neurovascular medicine, Erasmus MC

The first prize is for Linda Al-Hassany, PhD candidate since 2020 at Erasmus University Medical Center. Linda obtained a Bachelor degree in Pharmacy and Medicine and a Research Master degree in Health Sciences, with a specialization in Clinical Epidemiology. Besides she also completed the Course Chinese (level 1) and followed a summer school at the Chinese University of Hong Kong where she completed a project on Health and Aging in China and the courses 'Fundamentals in Chinese Medicine' and 'China on Screen'.

In her research, which focusses on "The pharmacology and cardiovascular aspects of migraine" she is able to integrate her broad academic background. In order to understand how cardiovascular risk and related sex- and gender aspects are associated with migraine, she conducts basic, clinical and epidemiological research. And as if that is not enough she also carries out a societal project inspired by her personal experience as a young female researcher with an ethnic minority background. For the latter she was also able to secure funding by being the main applicant and executor of the Open Mind Health & Technology and Convergence 'CHANGE! project: Conscious Health dAta shariNg in movinG RottErdam!' and a co-applicant and executor of the 'SERIOUS-studie: Seks, gEnder en caRdiOvascUlair riSico bij migraine serieus genomen'.

In her short career she has been able to publish 14 articles, including two in Lancet Neurology (impact factor 44,2).

Let me share some quotes with you from the recommendation letters we received:
"It is a true contentment and pleasure to guide Linda. She is one of the most genuinely talented, ambitious, and hard-working PhD students I have ever met and supervised in my career. Linda is an intelligent and energetic young female researcher with a broad general development, who also has the perseverance and exudes drive to excel in performing her research projects."

"Linda truly has a natural inclination for scientific research. This is not solely based on her outstanding academic achievements so far, but also her personality, work ethic, unstoppable energetic attitude, independence, and scientific visions."

Given her outstanding achievements, it comes as no surprise that her talents have not gone unnoticed. Linda has received a range of awards and grants including the IHS Junior Research Grant (€ 10,000) from the International Headache Society, the Van Leersum Beurs (€ 2,900) and the Van Walree Beurs (€ 1,000) from the Koninklijke Nederlandse Akademie van Wetenschappen (KNAW) and a Gender in Research Fellowship from the Netherlands Organisation for Health Research and Development (ZonMw). Furthermore, it is also interesting to mention that she was a participant in the ‘Rotterdam100’, a talent competition for ambitious students and young professionals. These are all signs of recognition of her extraordinary performance.

We are delighted to award the For Women in Science Rising Talent – First Prize to Linda Al-Hassany and we wish you success in your further research career.

Second prize - Sanne van Neerven, Colorectal cancer/Stem cell competition, Amsterdam UMC

The jury has awarded the For Women in Science Rising Talent - Second Prize to Sanne van Neerven, PhD candidate at Amsterdam University Medical Center, based on her ground breaking discoveries on how colon cancer develops. She focused her research on colorectal cancers that carry mutations in the APC gene which occurs in 80% of cases. The cancer starts in the colonic crypts, pockets in the lining of the colon where stem cells constantly replenish the sloughed off colon epithelial layer. To study how APC mutant stem cells compete with the neighbouring normal cells in the crypt, Sanne set up an entirely new co-culture system based on the organoid technique (“colons in a dish”). She observed that the APC mutant cells not only compete with the normal cells but in fact push their neighbours into a differentiated state so that they no longer divide. Such super competition had previously been described in fruit flies and is likely to be a more general phenomenon during tumor development. Sanne went on to determine the signaling pathways that are responsible for the super competition by APC mutant cells. She found that the APC mutant cells cut off the life-line of WNT signaling that allow normal stem cells to divide. Using this information in a mouse colon cancer model system, she could show that a WNT booster indeed diminished the tumor initiation by the APC mutant cells. This breathtaking set of innovative experiments was published in Nature in 2021 with Sanne as sole first author.

Sanne’s nominators expressed their praise for her:

“She has been instrumental in the design of cell competition models and has revealed intriguing new cellular competition mechanisms.”

“Sanne is a true rising talent in our field, not only because of her academic skills but also because of her dedication and passion for science, which is contagious”.

“Outside our lab she is a true ambassador for science. Over the years she has been organizing local discussions on science within the Dutch liberal party. Therefore, Sanne is the best ambassador for Women in Science you could wish for.”

“Sanne truly is the center of the laboratory, both with respect to knowledge of the literature, as well as in experimental design and experience. She masters a vast range of cell biological assays and molecular techniques and is very collaborative. She is very skillful to use her vast talents, not only in her own studies but also to promote the research of others.”

Starting in April of this year, Sanne will join the Gurdon Institute at the University of Cambridge as a postdoctoral fellow to continue to pursue stem cell research. We look forward to her future discoveries and congratulate her with this highly deserved recognition.

Third prize - Nga Phung, Design and engineering material for solar energy, Eindhoven University of Technology

The jury awarded the For Women in Science Rising Talent – Third Prize to a scientist in the field of solar cell applications: Nga Phung from Eindhoven University of Technology.

Nga works on the synthesis and characterisation of materials for solar cell applications, with a main focus on an upcoming class of solar cell materials namely metal halide perovskites. In only a decade of technological development these materials, combined with more conventional silicon cells, have achieved more than 25% efficiency, at par with established photovoltaic technologies. After an MSc with honour at Delft University of Technology, Nga started to work as a PhD student at the University of Potsdam, especially looking at the influence of defect in these materials, and how they influence stability, and graduated Magna Cum Laude. She received many offers for postdoctoral positions, but chose since September 2020 to work as a postdoctoral researcher at Eindhoven University of Technology, looking specifically at contact layers that could further improve the efficiency of these cells.

For several reasons the committee thinks that Nga is a very special candidate. Coming from Vietnam, Nga started her academic path by funding her own BSc (in Japan) and MSc (in Delft) studies from scholarships granted to only the most excellent students, proving not only her academic qualities, but also her determination and motivation. During her PhD and start of postdoc she published seven impactful papers reviews, and another twelve as co-author, testifying not only of a great productivity as leading researcher, but also her ability to contribute to team work. This is the more remarkable as, according to her supervisor at the Helmholtz Zentrum Berlin, she was the very first member of his lab, and hence at the start had to spend much time to establish a new lab, order equipment, develop lab protocols and only then starting experiments. According to her postdoc supervisor she has also developed a unique talent discussing the fundamental aspects of her research with academic peers as well as industrial collaborators, for instance fueling a strategic collaboration with Dutch and German companies/end-users, and key experiments within the Solliance Solar Research Consortium.

Overall she seems a very worthy recipient of this prize and a role model also for others, showing (as one of the nominators mentions) “how commitment, passion and competence are key to a successful career and academic achievements”. We wholeheartedly congratulate her with this prize!

Honorable mention - Rhythm Shukla, Solid-state NMR/Biochemistry/Confocal microscopy, Utrecht University

One of the two honourable mentions this year is awarded to Rhythm Shukla, PhD candidate at Utrecht University.

Rhythm has been a PhD candidate since 2019, so she is only in her 3rd year. During that time, her outstanding work has amounted to several notable publications, including two 1st author publications in very prestigious journals, one in Nature Communications and one to appear

soon in Nature. Her article in Nature Communications received wide press coverage and her upcoming article could mean a quantum leap for antibiotics research.

Rhythm investigates the working mechanism of the antibiotic teixobactin, discovered in 2015 by Kim Lewis and his colleagues and the first new antibiotic identified in 30 years. Hailed as a ‘game changer’ in the combat against drug-resistant bacteria, there was general understanding of its mechanism of action that explains lack of resistance, but also several questions that remained unresolved.

Rhythm’s first contribution closed a major knowledge gap by showing that a synthetic analogue of teixobactin binds to a highly conserved motif of a special lipid (called Lipid II) that only exists in the bacterial membranes. She discovered that when two molecules of teixobactin bind to their target, they form a complex, and additional teixobactins join in. Using sophisticated solid-state NMR experiments, microscopy, and molecular modelling, Rhythm showed that teixobactin thus forms a supramolecular structure on the surface of the membrane of pathogens, thus making it impossible for bacteria to develop resistance against it.

In 2020, Kim Lewis started a collaboration with Rhythm to see if the native teixobactin shows similar properties to the synthetic analogue. It was shown that natural teixobactin binds to Lipid II with much higher affinity. Rhythm then made an unexpected new discovery: once the supramolecular structure forms, the highly organized fibrils not only hinder the bacterial growth processes, but also damage the membrane at the same time. This dual antimicrobial attack explains why teixobactin is so unusually potent in killing pathogens. This is a paradigm shift in antibiotics research in order to combat antimicrobial resistance of pathogens, such as *Staphylococcus aureus*. *S. aureus* is a gram-positive bacteria causing a wide variety of clinical diseases; treatment remains challenging due to the emergence of multi-drug resistant strains such as MRSA, the so-called hospital “superbug” Methicillin-Resistant *Staphylococcus aureus*.

The jury is convinced that Rhythm will continue to make breakthrough discoveries in structural biology and with this award encourages her to follow her passion to do exciting science with high societal impact.

Honorable mention - Carmem Maia Gilardoni, Physics, University of Groningen

Carmem Maia Gilardoni investigates qubits, the basic building blocks for quantum technology. This technology may bring unanticipated progress to diverse fields of science, including pharmacy, communication and materials. She finds ways to handle these qubits on specific temperature and with tools like light or electricity. Her aim is to understand which shape these qubits should have to fulfil the role their application will demand. This fundamental work can have far-reaching consequences and may be at the basis of many future application.

Carmem started her career at the University of Brasilia, in Brazil, as a bachelor in physics. In 2015 she moved to Groningen to study a Master in nanoscience. In her PhD, which she completed Cum Laude, she investigated the optically addressable spins in 2D material, under the supervision of Prof. dr. Casper van der Wal, who also supervised her master thesis. She wrote five articles, that were all very well received and gave two invited lectures at international conferences. In 2020 she organized and chaired a (virtual) symposium on quantum mechanics. She now works as a postdoc at the University of Groningen and supervises several students.

Her PhD supervisor described her as a very smart, creative, skilled, self-learning person who has a talent for recognizing and sharpening the right physics questions (in both theory and experiment). She is a top performer in research planning and proposing of new projects, and on organizational, strategic, political, and social-emotional aspects of academic work.

The jury was impressed by her work and expects to hear a lot more from her in the years to come.

Prof. dr. P.E. (Petra) de Jongh, Professor of Catalysts and Energy Materials at the Debye Institute for Nanomaterials Science, Utrecht University

Prof. dr. T. (Titia) de Lange, Leon Hess Professor of Cell Biology and Genetics/Director Anderson Center for Cancer Research, The Rockefeller University

Prof. dr. J.J. (Jacqueline) Meulman, Director of Research and Development, Leiden University Center of Statistics: LUXs data science, Adjunct Professor Department of Statistics, Stanford University, Professor emeritus Applied Statistics, Mathematical Institute, Leiden University

Prof. dr. I.E.C. (Iris) Sommer, Professor of Cognitive Aspects of Neurological and Psychiatric Disorders, UMC Groningen

Prof. dr. C. (Cisca) Wijmenga, Rector Magnificus, University of Groningen, Lodewijk Sandkuijldistinguished University Professor, University of Groningen

The jury meeting took place 21 March 2022, was chaired by Drs. I.C. (Inge) Bryan, board member KHMW, and also attended by Prof. dr. A.P. (Ad) IJzerman, Secretary of Natural Sciences KHMW and Drs. S. (Saskia) van Manen, Secretary (minutes).