ERA-NET NEURON
NEWSLETTER 36

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ANNOUNCEMENTS FROM NEURON COFUND2

FEATURED

Interview with lay reviewer
Henk Lindeman - pg. 9

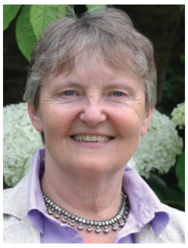
Interview with EPNA2020 Awardee,
Dr. David Zada - pg. 12

CHECK OUT

NEURON's **new YouTube channel –**
including recordings
from our Kickoff symposium:
Together for Brain Research!

› YouTube

From the desk of the coordinator | May 2021



Marlies Dorlöchter

Dear All,

NEURON cofund2 is well on its way with a first Joint Transnational Call for Proposals co-funded by the EU on the topic of 'Neurodevelopmental Disorders' launched on January 7th! The deadline for the submission of the preproposals was March 9th and we're looking forward to welcoming new funded consortia to the NEURON family.

The new NEURON Cofund2 network is larger than ever with 27 partners from 23 countries. The opening of the new era was celebrated with a notable Kick-off symposium on January 27th, entitled "Together for brain research", thus accurately reflecting NEURON's holistic, collaborative and inclusive approach to brain research. The symposium touched on four important pillars that need to be considered in order to promote brain research in Europe: priorities for brain research in neurology and psychiatry, links between lay organizations, basic scientists and clinicians, data sharing, legal and ethical aspects in brain research and strengthening and structuring brain research in the EU. More on the Kick-off symposium can be found on page 4.

Funded by the European Commission

More information can be found on our website
http://www.neuron-eranet.eu/index.php
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EraNeuron

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The Kick-off symposium was held back-to-back with NEURON's JTC2018 midterm symposium on 'Mental Health', which included a virtual award ceremony and a presentation by the Excellent Paper in Neuroscience Awardee for the year 2020, Dr. David Zada who talked about his findings on the relation between sleep, chromosome dynamics and DNA integrity in neurons. An interview with Dr. Zada can be found on page 12. Also included in the Midterm symposium was a workshop on quality in science, now second in line in conjunction with the European Brain Research Area project (EBRA). This workshop reflected to the scientists and clinicians who participated in the symposium, NEURON's commitment to the highest quality assurance in research.

One of our major goals is to reinforce our connection to the people influenced by brain disorders and increase their meaningful participation. Just recently, on April 20-21st we completed a virtual 2-day educational workshop organized collaboratively with the European Federation of Neurological Associations (EFNA) to prepare people who are interested in becoming a lay reviewer for our latest funding call on neurodevelopmental disorders. This workshop forms another milestone in NEURON's sincere devotion to strengthen the collaboration with patients, carers and patient representatives at various levels and our considerable and continued effort to improve and implement new and valuable ideas and measures (more on page 7). This issue also features a special interview with Henk Lindeman, a lay reviewer who successfully took part in NEURON's JTC2019 review panel (page 9).

Covid19 is still affecting people and actions worldwide, but we don't let it impede our activities and goals. Just recently, on May 10th, we had our annual foresight symposium on the topic of 'Blood-Brain Barrier and Cerebrovascular diseases'. The symposium included renounced speakers with expertise on the topic and the outcomes will soon be published in the foresight report. The foresight symposia are means by which NEURON ensures keeping up to date and relevance to the updated Strategic Research Agenda. More on the foresight symposium and report in our next newsletter.

With this, I wish you good health and welcome you to keep up with our website and follow us on twitter @EraNeuron in order not to miss further information on our calls and events.

Sincerely yours.

ERA-Net NEURON's JTC2018 Midterm Symposium on Mental Disorders

26-27 January, 2021, Virtual meeting

Approximately 90 participants joined the JTC2018 Midterm symposium on the topic of 'Mental Disorders', which had to take place virtually due to the Covid19 pandemic. Despite the virtual platform, the event brought with it exciting scientific results and enthusiastic discussions, which allowed to recreate the lively atmosphere these symposia have always had in the past.

Mental disorders are a major cause for morbidity, mortality and impaired quality of life in Europe. Biomedical and health research provides important knowledge to better understand mental disorders and helps improving diagnosis, therapy, and rehabilitation procedures. 14 transnational research consortia are funded under the umbrella of the NEURON JTC 2018 "Mental Disorders". In total, 62 research groups from 11 European countries, Canada and Israel collaborate in these multinational interdisciplinary projects.

In accordance with ERA-Net NEURON's long-time support and investment in Early Career Researchers (ECRs) and with the long lasting tradition of poster presentations by ECRs involved in the projects in the framework of the Midterm symposium, ECRs were not overlooked this time as well. ECRs from all projects funded under JTC2018 were invited to present a virtual poster in a dedicated virtual room, which could be joined by the symposium participants. Regardless of the virtual mode of interaction, these rooms allowed the ECRs to present their work in the project and provided an opportunity for exciting discussions and detailed dialogues on scientific methods and results. Moreover, the virtual rooms brought together ECRs from different labs in the same consortium, thus providing an opportunity for intra-consortium interactions, in addition to the conversations and feedback from the other participants.

Finally, the Midterm symposium included a fascinating joint workshop with EBRA on **'Neuroethics and quality assurance'**. NEURON's task in the EBRA project is to accelerate excellence, innovation and translation, and foster exchange by promoting Open Science and quality assurance in research – this workshop is one of the approaches in attempt to execute the above task. The workshop included three talks: The first by Prof. Ulrich Dirnagl (Charité, QUEST, Berlin, Germany) on: **Your bench is closer to the patient bed than you think!**; the second talk by Prof. Daniel Strech (Charité, QUEST, Berlin, Germany) on: **How to safeguard the value of animal research**; and lastly, Dr. David Winickoff, from the Working Party on Bio-, Nano- and Converging Technologies (BNCT), OECD, spoke on **'Recommendation on Responsible Innovation in Neurotechnology'**. The workshop ended with a panel discussion and was very well received.

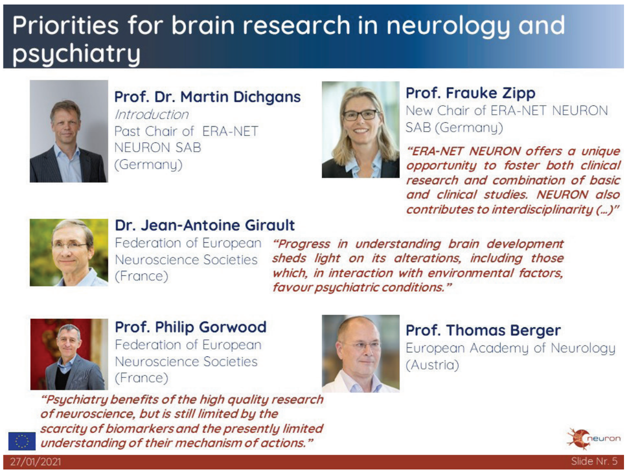
NEURON Cofund2 Kick-off Symposium: Together for brain research

27 January, 2021, Virtual symposium

To celebrate the initiation of a new phase in NEURON - NEURON Cofund2 – in which 27 partner members from 23 countries joined together to support brain research, a scientific symposium titled 'Together for brain research' was organised by NEURON partners Etienne Hirsch (INSERM) and Bernard Poulain (CNRS). The symposium brought together renowned researchers and other stakeholders to discuss how to work together in tackling brain diseases.

Over 120 participants attended the virtual symposium, which included four round-table discussions addressing various challenges and needed transformations in different areas of interest related to brain and neuroscience research.

The symposium opened by NEURON coordinator, Marlies Dorlöchter, announcing the opening of the new NEURON phase with 27 participating ministries and funding organisations from 23 countries and the European Commission and emphasising that the NEURON network is larger than ever and NEURON's strategy is to follow a holistic approach to advance brain research.



Priorities for brain research in neurology and psychiatry

Prof. Dr. Martin Dichgans
Introduction
Past Chair of ERA-NET NEURON SAB
(Germany)

Prof. Frauke Zipp
New Chair of ERA-NET NEURON SAB (Germany)
"ERA-NET NEURON offers a unique opportunity to foster both clinical research and combination of basic and clinical studies. NEURON also contributes to interdisciplinarity (...)"

Dr. Jean-Antoine Girault
Federation of European Neuroscience Societies
(France)
"Progress in understanding brain development sheds light on its alterations, including those which, in interaction with environmental factors, favour psychiatric conditions."

Prof. Philip Gorwood
Federation of European Neuroscience Societies
(France)
"Psychiatry benefits of the high quality research of neuroscience, but is still limited by the scarcity of biomarkers and the presently limited understanding of their mechanism of actions."

Prof. Thomas Berger
European Academy of Neurology
(Austria)

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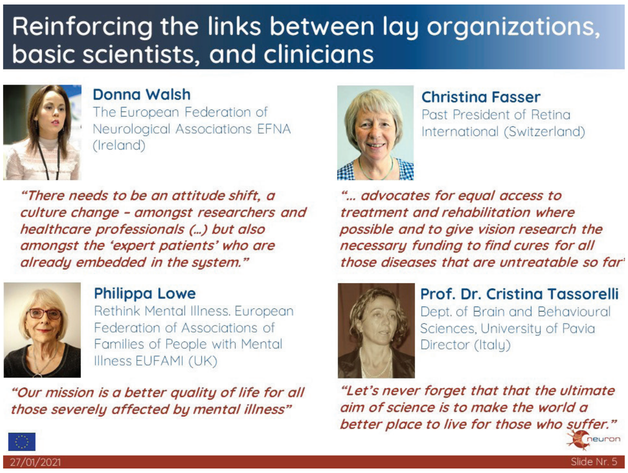
The first round table on the topic of 'Priorities for brain research in neurology and psychiatry' included **Martin Dichgans** (Germany) and **Frauke Zipp** (Germany) as past and present chairs of NEURON's Scientific Advisory Board (SAB), **Jean-Antoine Girault** (France) representing the Federation of European Neuroscience Societies (FENS), **Thomas Berger** (Austria) of the European Academy of Neurology (EAN), and **Philip Gorwood** (France) of the European Psychiatric Association (EPA).

The second round table, which underlines NEURON's commitment for encouraging meaningful patient involvement in research, was titled 'Reinforcing links between lay organisations, basic scientists, and clinicians'. Panellists were **Christina Müller** (Germany) from ERA-NET NEURON, **Cristina Tassorelli**



Reinforcing the links between lay organizations, basic scientists, and clinicians

Donna Walsh
The European Federation of Neurological Associations EFNA
(Ireland)
"There needs to be an attitude shift, a culture change - amongst researchers and healthcare professionals (...) but also amongst the 'expert patients' who are already embedded in the system."

Christina Fasser
Past President of Retina International (Switzerland)
"... advocates for equal access to treatment and rehabilitation where possible and to give vision research the necessary funding to find cures for all those diseases that are untreatable so far"

Philippa Lowe
Rethink Mental Illness. European Federation of Associations of Families of People with Mental Illness EUFAMI (UK)
"Our mission is a better quality of life for all those severely affected by mental illness"

Prof. Dr. Cristina Tassorelli
Dept. of Brain and Behavioural Sciences, University of Pavia
Director (Italy)
"Let's never forget that that the ultimate aim of science is to make the world a better place to live for those who suffer."

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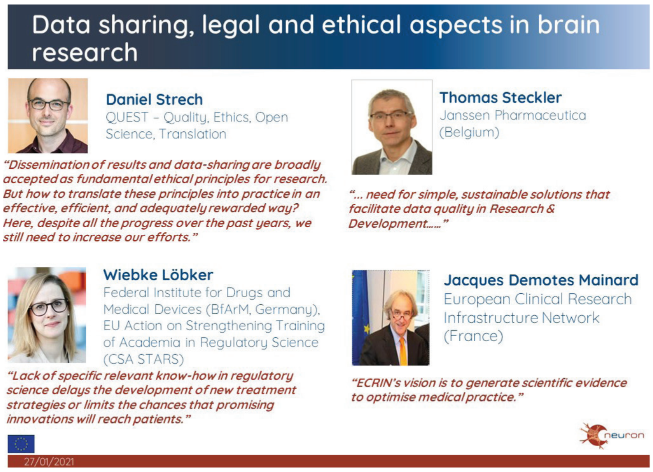
(Italy) from the University of Pavia, **Donna Walsh** (Ireland) of the European Federation of Neurological Associations (EFNA), **Philippa Lowe** (UK) of the Rethink Mental Illness and European Federation of Associations of Families of People with Mental Illness (EUFAMI), and **Christina Fasser** (Switzerland) as Past President of Retina International. In view of the tasks ahead that were discussed during the panel, the collaboration of NEURON with EFNA was applauded by all panellists.

The third panel discussion on 'Data sharing, legal and ethical aspects in brain research' fostered NEURON's aspiration to accelerate translation of research results into clinical practice. **Daniel Strech** (Germany) of the QUEST center Berlin, **Jacques Demotes** (France) of the European Clinical Research Infrastructure Network (ECRIN), **Wiebke Löbker** (Germany) of the STARS project and **Thomas Steckler** (Belgium) from Janssen Pharmaceutica, spoke on the essential requirements and opportunities for effective translation of preclinical research into clinical practice.


Data sharing, legal and ethical aspects in brain research

Daniel Strech
QUEST – Quality, Ethics, Open Science, Translation

"Dissemination of results and data-sharing are broadly accepted as fundamental ethical principles for research. But how to translate these principles into practice in an effective, efficient, and adequately rewarded way? Here, despite all the progress over the past years, we still need to increase our efforts."

Thomas Steckler
Janssen Pharmaceutica
(Belgium)

"… need for simple, sustainable solutions that facilitate data quality in Research & Development……"

Wiebke Löbker
Federal Institute for Drugs and Medical Devices (BfArM, Germany), EU Action on Strengthening Training of Academia in Regulatory Science (CSA STARS)

"Lack of specific relevant know-how in regulatory science delays the development of new treatment strategies or limits the chances that promising innovations will reach patients."

Jacques Demotes Mainard
European Clinical Research Infrastructure Network
(France)

"ECRIN's vision is to generate scientific evidence to optimise medical practice."

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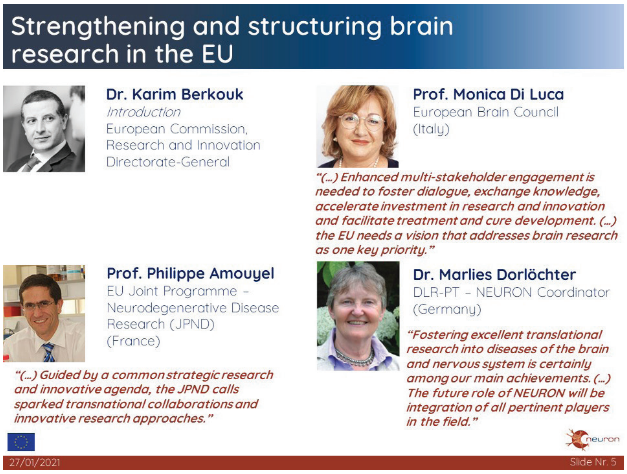
Strengthening and structuring brain research in the EU

Dr. Karim Berkouk
Introduction
European Commission, Research and Innovation Directorate-General

Prof. Monica Di Luca
European Brain Council
(Italy)

"(…) Enhanced multi-stakeholder engagement is needed to foster dialogue, exchange knowledge, accelerate investment in research and innovation and facilitate treatment and cure development. (…) the EU needs a vision that addresses brain research as one key priority."

Prof. Philippe Amouyel
EU Joint Programme – Neurodegenerative Disease Research (JPND)
(France)

"(…) Guided by a common strategic research and innovative agenda, the JPND calls sparked transnational collaborations and innovative research approaches."

Dr. Marlies Dorlöchter
DLR-PT – NEURON Coordinator
(Germany)

"Fostering excellent translational research into diseases of the brain and nervous system is certainly among our main achievements. (…) The future role of NEURON will be integration of all pertinent players in the field."

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The last panel concentrated on the unified approach that should be taken to move brain research in Europe forward and fulfil its full potential in order to decrease the burden of brain diseases on the patients, families and society as a whole. The panel, titled 'Strengthening and structuring brain research in the EU', included panellists **Karim Berkouk** of the European Commission, Research and Innovation Directorate-General, **Marlies Dorlöchter** (Germany) from ERA-NET NEURON, **Monica di Luca** (Italy) of the European Brain Council (EBC), and **Philippe Amouyel** (France) of the EU Joint Programme on Neurodegenerative Disease Research (JPND). The merits of having a strategy to create a global brain research area was seen as NEURON's strength – NEURON's new and updated Strategic Research Agenda (SRA) highlights priorities such as sharing of resources, which has been identified as an essential pillar in developing the knowledge and technologies necessary for tackling down brain-related diseases.

Finally, the panel discussions and the important issues that were encompassed were precisely summarized by **Elena Becker-Barroso**, Editor-in-Chief of 'The Lancet Neurology' journal, who pointed out in her most recent editorial, ‘Neurological burden and European invest: a disconnect’, some serious issues and gaps with regard to reduced investments in the field of brain-related disorders. In her summary she addressed NEURON’s successes, such as considerations for patients’ needs that lead to more impactful research and the gain of credibility of science in society, and challenges ahead, such as guidance, training and education of both sides, patients and researchers, and the integration of patient opinions into the translational research decision-making. She also pointed out the lack of reproducibility and thus research waste, and pin pointed such challenges as implementing data sharing and open data and the need for appropriate methods and infrastructures to do so.

All these engaging and inspiring discussions provided NEURON with input and motivation to continue and improve current programs, invest into research projects, strengthen cooperation with stakeholders and pertinent organisations, reinforce engagement of patients, implement new activities, and overall - pursue new ideas!

Together for Brain Research: A Patient Training Workshop

April 20-21, 2021, virtual meeting

Active involvement of patients is essential for the majority of health and healthcare related research. The last 20 years have seen a growing interest at European, national and local level in patient engagement, and in particular a focused interest in patient and public involvement (PPI) in research. Numerous scientific and societal challenges are deemed to be more efficiently addressed with public engagement and participation taking place. We use the term 'patients and public' to include current, former and potential patients, carers, people who use health and social care services, and people from organisations that represent people who use these services.

In 2016 NEURON started the implementation of PPI as a learning process, in parallel with and as part of the NEURON calls. The strategy is essentially of developmental nature and organisations that represent patients and the public such as EFNA are indispensable partners in this process in NEURON.

Since 2019, NEURON has developed a strategy for PPI at different steps for the annual calls for proposals. Research approaches funded in the scope of NEURON usually comprise translational, clinical or health care research. NEURON emphasizes translation of research results as a central objective in each call for research proposals. The relevance and feasibility of the proposed research projects are therefore among the most important aspects. On both those aspects a lay perspective will benefit the proposal design and review process. Engaging patients at all levels of research and research funding is an important vehicle to implement their views, needs and aspects into the process.

We strive to further advance this translational focus by involving patients in all phases of call preparation, evaluation and conduction. Therefore, the European Federation of Neurological Associations, EFNA, and NEURON intensified the existing cooperation with the aim to empower patients and carers for active participation in the review process of scientific research proposals.

To achieve this goal, annual lay reviewer training workshops are planned by NEURON and EFNA. Involving patients with health conditions may represent a particular challenge for both the patient and the researcher. However, these experiences serve to document the value of considering PPI in research in many brain diseases.

The training workshops join people affected by neurological and psychiatric conditions or by sensory organ disorders and their carers, experienced lay reviewers, patient organizations, scientists, and members from ERA-NET NEURON to reflect and discuss the roles of patients, carers and family members in shaping and funding research, and - not least - to introduce potential future NEURON lay reviewers to the procedures of an international review process.

A first pilot workshop was conducted on April 20-21 this year. Over 20 participants from 13 countries, 10 people living with neurological or psychiatric disorders, 2 carers or family members, 7 representatives form patient organisations, 2 external guest speakers and a panel of experienced lay reviewers teamed up with the organizers from NEURON and EFNA.

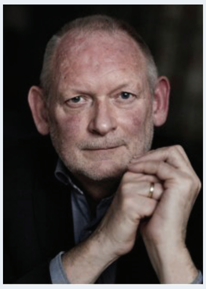
The programme of the workshop comprised of interactive sessions to introduce ERA-NET NEURON in general and the particular roles of lay reviewers in the NEURON funding scheme, hands on trainings to practice written lay reviews and discuss them at a panel meeting, and a practical training on confidence building. Past NEURON lay reviewers shared their experiences in a panel discussion. A well established and successfully implementing PPI scientist provided valuable insights from the researchers' side.

Not least, the fun and interaction between all participants were central aspects: In small groups, patients, carers, representatives of patient organisations, and funders could get to know and learn from each other. All this thanks to the efficient, thoughtful and kind organisation and moderation by Dr. Claire Nolan, Joke Jaarsma, Presidnet of EFNA and Donna Walsh, the Executive Director of EFNA. The first feedback was widely positive:

- "Great fun hearing all the experiences!"
- "Thank you for showing us the power of lay reviewers."
- "It was so well organized, very informative, very interesting and an eye-opener."
- "ERA-NET NEURON is doing an amazing job involving patients in the research-funding process! It's impressive."
- "I just wanted to say - well done! I found the event to be really well-organised, I feel that we can all have a say, a clear narrative has been presented and I feel that expectations have been managed. Thank you very much!"

As a follow up, a survey will be conducted among the participants, to receive specific feedback and see, hopefully, many commitments for lay reviewers for the current NEURON call on Neurodevelopmental Disorders.

Personal Interview with Henk Lindeman



More than 20 years ago, at the age of 38, Henk Lindeman suffered a cerebral infarction in the back of his right hemisphere. His stroke has affected his movements, visualization, spatial orientation and much more. Despite these obstacles, Henk has managed to lead a rich and active life. He is most bothered by mental fatigue, which was the reason he could work no more than three days a week and several years ago, when he was 60, had to stop working altogether. Having lived with his condition for over 20 years, Henk has a lot of experience as a person with a brain ailment. His coping mechanisms, insights, lifestyle and outlook have been an inspiration to patients, families of patients and medical professionals. In the past several years Henk is engaged as a patient representative providing the patients' perspective input to research and healthcare. Henk has taken part in the review panel of NEURON's JTC2019 proposals and recently participated in the workshop 'TOGETHER FOR BRAIN RESEARCH' organized by NEURON, EFNA and TINA. The workshop aimed to bring together people affected by neurological conditions, experienced funding panel lay reviewers and secretariat members from ERA-NET NEURON to discuss the role of patients, carers and family members in shaping and funding research.

When and why did you become a 'patient representative' and lay reviewer?

About four years ago I was asked to be a lay reviewer of medical research proposals for the Dutch Brain Council, a grant organization. The main reason for me was curiosity. After that session I realized, thanks to the review partners with whom I had to discuss our final arguments and scores, that lay reviews are very important. I realized that some researchers do act as if the research patients are not human beings with concerns and sorrows, bur are subjects with a typical medical condition.

How do you perceive your role as a patient representative?

I perceive my role as a patient representative mainly as an educator. Of course the lay reviewers have an active role in making the decision of whether a research project will be funded, but I hope and think that patient representatives will also teach the researchers to listen to what research participants can tell them about their experiences.

What are the rewarding moments of being a patient representative? Do you recall one particular rewarding moment you can tell us about?

I have had different rewarding moments during my work as a reviewer. The first was in the beginning when another lay reviewer explained to me that patient involvement is not only about the fact that research patients are participating and taken seriously, but also that other experienced patients represent patients; patients who are not in a dependent position with regard to the doctor/researcher.

A second memorable moment was when I participated two years ago in the review panel of ERA NET Neuron as a patient representative. There was a discussion between the scientific members of the panel about the question if patients who had had a stroke will accept a lumber puncture, because that was planned in the research. I had a stroke twenty-five years ago and I am sure I had refused a spinal tab some days after my stroke and therefore I would have not participated as a study participant in that research. The scientific members had a discussion that a spinal tab is not very burdensome. They forgot in their discussion that a few days after a stroke for every patient everything is very very burdensome. In that panel meeting, I learned that researchers are too optimistic about the inclusion of participants in their research and have to be pressed to look at a patient as a normal human being, not as a subject. And while I do understand them, I stay to argue to the researchers that patients are human people with a lot of sorrows.

In your opinion, why is the involvement of patients, carers and family members in medical research important? Please shortly describe in what aspects and stages of the research they should be involved and why.

The involvement of carers and patients is important in every stage of the research. I think the most important issue is patient involvement in the phase of thinking of topics to investigate. It should be useful if medical researchers/ the academic community in collaboration with the patient community (EFNA by example) will design a **joint medical research agenda** with the most important topics for medical research. And after that, it will be useful when the researchers, before the start of designing a proposal, discuss this with patient representatives and write the proposal in collaboration with the patient representatives.

It is also important for patient reviewers to review the pre proposals and make comments about the relevance, the feasibility and on the way the patients are involved during the research. The researchers can, on basis of the recommendations, fix or repair in the definite proposal the misconceptions about patient involvement.

During the research patients representatives can be a partner in the project team. Of course they are not responsible for the research, but they can be responsible for the input from the perspective of the (research) patients. They can be an intermediary between the research patients and the researchers and be responsible for the information to the research patients and can interrupt if the burden is too big for them. Patient representatives may, from the interest of the participants and (future) patients, possibly add different accents or nuances to the interpretation of the data. Patient representatives can assist in the presentation of the results to the scientific community, and even more to the whole community and (future) patients.

What are some of the challenges you encounter as a lay reviewer of medical research proposals?

The most important challenge as a lay reviewer is to create shared views with the other lay reviewers. Everyone has to start and to learn what is in for me. And what good patient involvement can be. In every country the possibilities of patient involvement are different. Therefore, **a main challenge for ERA NET NEURON is to design a shared view about patient involvement in an international setting**.

What were your impressions from the workshop organized by NEURON, EFNA and TINA? Do you think that these sort of workshops are important for moving forward to a more meaningful inclusion of patients in research? What other initiatives would you like to see?

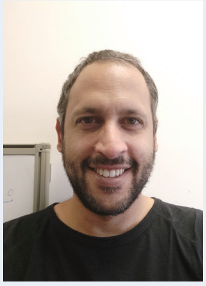
The workshop was very important and was very well organised. We really did share opinions, but also new potential lay reviewers got ideas about what the role of a lay reviewer is and if such a role fits them. **The next step is to learn with each other what good patient involvement can be**.

In your optimistic view – how would medical research be conducted differently in 5-10 years (from the patient's perspective)?

When I am very optimistic, I hope that in 5-10 years there will not be a need any more for lay reviewers, because every researcher and every research group will be convinced that patient involvement betters the research and will know how to implement it. Thus, lay reviewers will no longer be necessary.

2020 EPNA AWARDEE - Dr. David Zada, Personal Interview

The Excellent Paper in Neuroscience Award (EPNA) initiative was first introduced by NEURON in 2009, in order to support and encourage young scientists in the neuroscience field at the early stage of their career. The winners of the award receive a cash prize, as well as an invitation to present their work as special Young Investigators speakers in an international conference. This year the presentation and award took place virtually during the Midterm Symposium.



The 2020 EPNA awardee is **David Zada**. The award was given to Dr. Zada for his publication from his PhD studies in the lab of Prof. Lior Appelbaum in the Brain Research Center in Bar Ilan University, Israel: 'Sleep increases chromosome dynamics to enable reduction of accumulating DNA damage in single neurons' published in Nature Communications, 10:895, 2019. (https://www.nature.com/articles/s41467-019-08806-w).

Continue reading to learn more about David and his scientific journey.

Please tell us briefly about your research interests.

In my research, I study about the importance of sleep to the individual neuron in the whole organism. I'm using the zebrafish model to study the effect of sleep on DNA movements and how these movements enable efficient DNA repair in the context of living animal. Nowadays, I am trying to find the molecular pathways that transfer the signal to sleep from the single cell to the whole organism.

Please tell us about your scientific journey to-date.

After finishing my B.Sc. in the multidisciplinary brain research center at Bar-Ilan University, I joined Lior Appelbaum's lab where I did my M.Sc. and Ph.D. studies. During my M.Sc. and the first part of my Ph.D., me and colleagues established the zebrafish as a model to study psychomotor retardation called AHDS (Allan Herndon Dudley syndrome). Using this model, we investigated the cellular and neurological mechanism underlying this syndrome as well as translational research for treating this illness. I was fortunate, and some of the research was done in collaboration with different groups with different research models around the world. In the second part of my Ph.D., and now as a postdoctoral fellow, I studied the cellular function of sleep. Currently, I am planning my travel abroad to do a postdoctoral fellowship.

What made you choose a career in your field?

I really love to understand why and how things work. I think science, and especially biology, has been of great interest to me since high school. So it was clear to me that I was enrolling for a B.Sc. degree in life and medicine sciences.

My specific arrival at the lab I was in and the research I was involved in, was a combination of circumstances that included: a hitchhiking with a student from Prof. Lior Appelbaum's Lab, and enthusiasm for a cool live imaging of a single neuron inside a live animal I saw at a scientific seminar.

Where do you see your field of research in a few years? What are going to be the major breakthroughs?

Understanding the effect of sleep disturbances on aging, aging, degenerative diseases and cancer. And, as a result, give "sleep" as a treatment for these diseases.

What were the main challenges you had overcome in your career path and how did you overcome them?

Scientific-wise, unsuccessful experiments can frustrate you, but it's not really a challenge because I know that is how science goes, and you just have to attack the problem in a different way.

Personal-wise, we had to move to a very distant city because my wife started studying medicine there. I did not want to leave the study on sleep that had just started to show such significant and interesting results, so I just decided that I would travel two hours in each direction, and I become much more efficient at work, so that it is also not really a challenge.

Had COVID-19 impacted your research, if so how?

The COVID-19 has mostly taken us down 3 months of work in the last year, but I took advantage of them to put the results in order and start writing a new paper.

What are your goals for the future and where would you like to see yourself 5 years from now?

I am currently planning my travels abroad for postdoctoral studies with a different research model, which will allow me to expand my research and link sleep and aging research.
I really hope that I will be able to come back to Israel and become an independent PI.

What advice would you give your younger self or young scientists beginning their research career?

To try, to fail and to try again! unexpected results and sometimes even "bad" results, are the most interesting things. Listen to those around you, sometimes the best ideas and best collaborations come after you have listened to a lecture at some seminar that you did not want to go to.