The more stars, the brighter! Interview with the ECM award winner 2023

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In this early career forum, the 2023 ECM awardee shares her insights into research, her career path, her personal life and collaborations (@Mkg_Lehmann) https://bit.ly/4f0AiVY

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The European Respiratory Society (ERS) early career member (ECM) award intends to honour a promising ECM of the society who has made significant contributions to the field and has great potential to continue to do so in the future. At the 2023 ERS Congress in Milan, Dr Mareike Lehmann received this prestigious award (figure 1).

Dr Mareike Lehmann is currently a group leader at the University of Marburg (Marburg, Germany) and the Helmholtz Center Munich (Munich, Germany). She studied molecular biomedicine at the University of Bonn and Yale University before moving to Switzerland for her PhD. She joined the Comprehensive Pneumology Center in Munich as a postdoctoral researcher, where she became interested in lung ageing. She then started her own group in Munich focusing on cellular senescence in chronic lung diseases and has recently been appointed as an assistant professor of translational inflammation research at the University of Marburg. She was awarded with a prestigious Emmy Noether award that will further allow her to explore cellular senescence in chronic lung diseases.

As a member of ERS Assembly 3 since 2016, she has been involved in multiple ERS activities. She is the chair of an upcoming ERS Research Seminar on “Regenerating the lung – a multidisciplinary approach to combat COPD”. She has served as a speaker, moderator and presenter at multiple ERS conferences. At this year’s Lung Science Conference, she was a speaker in the Early Career delegates session talking about “Early career collaboration with respiratory peers”. Dr Lehmann is currently serving on the long-range planning committee of Assembly 3.

Dr Lehmann has contributed important work in idiopathic pulmonary fibrosis (IPF) and COPD translational research, including the first preclinical testing of senolytic compounds in pulmonary fibrosis in 2017 and the identification of a G protein-coupled receptor associated with fibrotic epithelium in 2022. This work has become an important reference for other studies of lung ageing in chronic lung diseases. Currently, she is investigating the effect of cellular senescence and inflammaging on the development of COPD and IPF with a special focus on extracellular vesicles.

Dr Lehmann was interviewed by a group of early career members, Senani N.H. Rathnayake (ECM of assembly 3), Joana Cruz (ECM of assembly 9 and previous ECM representative for that assembly), Sara

FIGURE 1 Mareike Lehmann, ERS ECM awardee 2023.

Cuevas Ocaña (ECM representative for assembly 3 and chair of the ECM committee) and Heleen Demeyer (current ECM representative for assembly 9), during a teleconference. Dr Lehmann provided insights into her research, her career path, her personal life and collaborations, which are presented in this article.

Congratulations on receiving the ERS ECM award! Would you like to share what sparked your interest in respiratory research, and specifically ageing, and how it has evolved over the years?

Thank you very much for having me. It is a pleasure to be here with you. Throughout high school, I was very interested in biology, and when I was 17, I wanted to do a science internship to see what life was like in a lab. I went to a lab in Giessen headed by Oliver Eickelberg, a researcher working on lung diseases. I spent a couple of weeks there and I very much enjoyed the spirit and the international community. That really sparked me. It is very funny, because now I have got a grant with my supervisor from 21 years ago.

I decided to study molecular medicine. I liked this programme because it is very focused on the translation to clinical care. I then moved to Switzerland to do my PhD (I did not study the lungs during my PhD). Switzerland was a great place, but not focused enough on clinical care. Therefore, I searched for a postdoc position that was more patient-focused. I contacted Oliver Eickelberg again. He invited me to the Comprehensive Pneumology Center in Munich, one of Europe's largest translational research centres, where I met Melanie Königshoff. I got the opportunity to start as a postdoc in her group. I really like her way of looking at science and the world. I just felt like that was the right place for me, so I moved. There I did research on epithelial cell phenotypes and inflammation. At that time, this hallmark of the ageing concept had come up in different organs, and we decided to look at how it translates to the lungs. We quickly found this to be a fascinating field, and we continued it over the years.

You are interested in endophenotyping COPD and IPF patients to identify treatable traits. How do your research findings translate into clinical practice to improve management and quality of life in chronic respiratory diseases?

We are interested in understanding how ageing influences susceptibility to disease, and we could show that ageing reduces the regenerative capacity of the lungs. If you look at the lungs of patients with chronic lung diseases, you see that they have more ageing phenotypes than those of age-matched persons. So, there is something in those lungs that leads them to age faster. We believe that this accelerated ageing phenotype leads to impaired regenerative capacity. This is the problem we have in patients; the lungs cannot regenerate.

What we aim to do now is to identify specific molecular ageing phenotypes in the lungs of patients. We believe we must look at disease-specific ageing phenotypes to target them. We want to do two things.

First, identify potential therapeutic targets and second, identify potential biomarkers that allow us to target patients at risk. By targeting those phenotypes, we aim to restore the regenerative capacity of the lungs. Simply, we want to reactivate the endogenous healing power of the lungs. For this, it is super important that we can identify those patients early enough. The earlier we can target them, the more successful we likely will be, so we need early diagnosis. At the same time, we also need ways to track whether the treatments we develop are successful.

Are there any promising therapies or interventions from your research that you believe will significantly improve patient care?

As I said, we are looking from a biomarker perspective, and we are looking from a therapeutic strategy perspective. We have shown in our lab some time ago that we can target specific ageing pathways in mice that can improve disease, specifically pulmonary fibrosis. This is done by drugs that target the so-called senescence. We are currently investigating the development of those so-called senolytics that are more specific for the type of ageing phenotypes we find in the diseased lung. We have developed a model of human lung ageing based on human lung tissue, where we can see the development of fibrotic phenotypes. We have identified a soluble factor that is secreted upon the induction of ageing and mediates profibrotic reprogramming of fibroblasts. We are now looking in patients to see if we can use this as a diagnostic tool and, at the same time, can inhibit this specific factor. This looks promising in our human *ex-vivo* models so we hope that we can move forward in the coming years.

How can international societies, such as the ERS, promote the implementation of these personalised therapies?

I think it is a really important question. If we do translational research, we need the best basic scientists to speak to the best clinicians and all of them to speak to the best physician-scientists together. I think it is still a problem to bring those people together. I feel societies, like the ERS, play an essential role in bringing people together to identify important translational problems to make sure we don't miss important problems that will change patients' lives. Next, these societies can provide the opportunity to create networks to allow for the implementation of clinical trials. If you think about personalised therapy, you need a big network to do this.

You hold multiple roles, as a Professor and a research group leader, among others. How do you manage your time effectively and maintain a healthy work–life balance?

I'm afraid I have no secret, but I can share with you what I think is important. I have learned that it keeps being a challenge. There is not one thing you can do that works forever, it is an ongoing process. You have to be conscious about it all the time, because your life changes. If you have children, first they are small and then, as they get older, they need different things. But also your work role changes. You have more PhD students, you get more grants, you have to write papers, you have to write grants. It is also very important that you identify activities that you enjoy and that you can do outside of work when you have the time. For me, that is being with my children, doing sports, reading, and spending time with friends.

The other thing that I have learned is that I really love my job and I think it comes with a lot of privileges. Sometimes we lose perspective on this. Obviously, it is exhausting to travel a lot, but it is also great. It is a privilege to see other places and meet people who are also my friends. I try to not forget about this. We also need to understand that we cannot always give 100% in all tasks we do, we only have 24 h in a day. So, you have to choose what is important for you and do it, nobody else can do it for you. It is a very personal decision, but you are also allowed to change this decision and readjust if you feel like you have to.

How important has mentorship or collaboration been in your career? Can you share any experiences where collaboration or mentorship significantly impacted your professional development?

For me, the most important aspects are the personal relationships, collaboration and mentorship that make this job worth doing. I think that, if you work with people who share your passion for research, this creates energy that is unparalleled. I think one of the big privileges in our job is that, at some point at least, you get to choose most of the people you work with. So, you are in a position where you can create much of the microenvironment you work in, including both your collaborators and the students you work with. Obviously, you cannot choose everybody, but you can choose a lot of people you work with, and that is something that we really have to consciously do. I have been very fortunate to have had many great mentors, and still have, and I think this support was/is instrumental, and I try to pay it forward to my mentees. For me, having someone who I can ask for guidance and who believes in me has always been super important. I was lucky to have Melanie Königshoff as my postdoc mentor, she is a super inspiring and energetic person who has a lot of passion for research, so it is enjoyable to talk about science with

her, and I know she is in my corner which is super helpful. There are many other people who also supported me. For example, Oliver Eickelberg, who I met a long time ago; I always call him when I have major life decisions to make. And I am lucky to have, in both institutions, institute directors (Bernd Schmeck and Önder Yildirim) that support me personally in my career development, but also my research.

You have moved places a lot over the years, were these moves choices or needs? Do you think you would have achieved a similar profile without them?

I am definitely sure it would be different. If it would be better or worse, I don't know, but it would have been different because the places you go and the research you do makes you the scientist you are. For me, I can say that all of those were very conscious choices, some harder than others. I studied in the town where I was born and, at some point, I thought "I have to leave otherwise I will never get out of here". I really wanted to go abroad, so I moved to Switzerland. This was a very easy move for me to do. Then, I realised "I don't want to stay in Switzerland" – I had a great time, but it is just not where I see myself ending up. Then, I moved to Munich and I spent a long time there. I personally liked it, both my children were born there, so it has a special place in my heart. The next move I made to Marburg was harder, because I had to drag my family with me, but I think it was very important that I did this because I wanted something I could not have in Munich. Sometimes, you have to make these choices to create opportunities. You may be lucky and things just come to you, but most of the time they don't. So, you have to go out and create opportunities, and then things happen. Then, you have to be brave and make choices, but it is great if you have choices. Moving broadens your horizon because, everywhere you go, you learn to look at problems from a different scientific angle, and that makes you a better scientist. Of course, it takes time to set up the research when you move, so you have to be very conscious about when and where you move. But it changes the way people look at you – you might be super independent, but people don't see it because you stayed in one place. They just realise that in the moment you move. At the same time, it is important to keep the network you established, as it enriches you. The ability to expand your network is another advantage of moving.

Moving is always an individual choice, and not moving doesn't mean you cannot be successful. There is no "one size fits all". There are always reasons why you might not be flexible to move, but you can still build a successful career and, most importantly, you can still be happy.

What piece of advice would you give to yourself if you could talk to yourself 5 years ago and what advice would you give to ECMs at the start of their career?

I have always loved my job and I have always told everyone that I have the best job in the world. But, I always doubted whether there was a future for me and I was always afraid I wouldn't make it. And this worry took away joy. So that is what I would tell myself: to worry less and to enjoy the process more. I believe that if you work hard and if you proactively search for opportunities, those opportunities will come. I believe there is a place for all of us in different roles and worrying doesn't help. That is what I would advise anyone starting: enjoy the process, believe in yourself and proactively create opportunities. And the ERS community is a very nice place to start creating those opportunities!

You have been nominated for the ECM award by a colleague. What significance does winning this award hold for you and has it influenced your research path in any way?

Winning this award means so much to me. I have worked really hard to be a good scientist, a good mother and a good member of the community. It is great to have that objectively recognised. It feels very good to be recognised for my work. Winning the award gives me visibility, beyond the usual networks I have, which is very valuable. Also, an award from an international research community carries some weight, which is important moving forward. For example, I am currently in a tenure track position, so it will be very helpful in my professional evaluation. Beyond the fact that it means the world to me, it also helps to recognise people who fight to have a research career, people who are trying to support the community and also have a family at the same time. There are a lot of people like this out there and I think they all deserve an award. I am an example of someone who is trying to do that and I hope that it can be an inspiration that it is possible.

During your Mina Gaga lecture at the ERS Congress you also inspired many ECMs with the quote "the more stars the brighter". Can you explain what this means for you?

I really believe in the power of peer support or peer mentoring. We always search for mentors who are 30 years older and much more experienced. I think that we can support each other almost as well, and I think as a community of ECMs we should be more supportive of each other. Historically, the scientific community has been very competitive and people have been afraid to talk to competitors. I believe there is space for all of us in different roles. Science has become more and more of a team sport and collaboration

is becoming much more important. We are lagging behind in how we interact with each other. I think we have a responsibility to do this as ECMs and to change this for the future. Many of us will be the future leaders and we have the power to change the way we interact as a community. At the end of the day, we all want the same thing: to improve the lives of our patients. If we support each other, we will go a lot faster and achieve a lot more. I really think that we should help each other. We should share networks, we should be generous, for example, by sharing grants and collaborating with each other. We should create opportunities for each other, for example, by saying each other's names in a room full of opportunities. If we do that, I think that we can make the world a better place. If we let others shine, we will have many more stars in the sky that will make the world brighter for all of us in the end.

Take home messages

- Achieving work–life balance is an ongoing process without a magical solution. Identify activities you enjoy outside of work to maintain the balance.
- Work together with people who share your passion for research.
- Try to worry less and enjoy the process more. Be brave, make choices, and create opportunities for growth in your professional career. If you search proactively for opportunities, they will show up.
- As ECMs, we should create opportunities for each other. By collaborating, we can move science much faster and achieve what we all want: a better future for our patients.
- Let others shine! More stars in the sky will make the (research) world brighter for all of us.

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Conflict of interest: S. Cuevas Ocaña is a European Respiratory Society officer (representative of the Early Career Members of Assembly 3 and the Chair of the Early Career Member Committee). H. Demeyer is a European Respiratory Society Officer (representative of the Early Career Members of Assembly 9. M. Lehmann reports funding from Berlin Chemie (podcast on lung regeneration in COPD) and Boehringer Ingelheim (research grant), unrelated to the present manuscript. S.N.H. Rathnayake and J. Cruz do not have any conflicts of interest to declare.

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