Profile

Erika von Mutius: reshaping the landscape of asthma research

When Erika von Mutius tried to outsmart the funding authorities, she had no idea that when her plan backfired it would lead to "the big-break" in her medical career. "I had just spent 2 years running a study into the effect of air pollution on croup in children, but I'd had no experience of how to run a project and felt it had just all been a mess, so when my boss asked me to run another project I was desperate to avoid it. I therefore applied for an outrageously high sum of money so the authorities would reject me. To my complete surprise, however, they came up with the cash."

Now a professor at the University Children's Hospital, University of Munich, Germany, von Mutius has gone on to win seven awards for her work to further our understanding of the causes of child asthma and allergic disorders in Europe. Her research has shown how children exposed to certain "harmful" environmental factors are far less likely to suffer from asthma and allergies. Today she also argues that allergies develop much earlier than is commonly thought—and may even occur before birth.

According to her former mentor, Fernando Martinez, director of the Respiratory Sciences Center at the University of Arizona in Tucson, USA, von Mutius has reshaped the research landscape. "Experts once told Erika to tone down her supposedly radical suggestions that various 'nasties' might have protective qualities. Today, however, the same views she forwarded then are deeply engrained in literature on asthma and allergies."

This radical research path emerged after medical studies at the University of Munich and an internship at the University Children's Hospital, in 1984, where von Mutius worked in general paediatrics and neonatal and paediatric intensive care. After running the air pollution project, her successful application for more than 1 million Deutschmarks set her on a course to analyse the local prevalence of asthma and allergy. In the midst of this research came a surprise. "I'd long been thinking that air pollution levels were very low in Munich and had to be very high in industrial East Germany, but I knew that for propaganda reasons the [Communist] regime would never allow a comparative study. Suddenly, however, the Berlin Wall fell and the chance appeared", she says. Teaming up with two interested doctors in Leipzig and Halle, von Mutius began studies in former industrial strongholds of Bitterfeld, Merseburg, Leipzig, and Halle where the river Saale had run violet with toxic waste. But when her team analysed their results they were left speechless: the prevalence of hay fever and allergic sensitisation was about 50% lower in these areas than in and around Munich.

During her fellowship at the Respiratory Sciences Center at the University of Arizona, in 1992, Martinez encouraged von Mutius to think creatively when researching instead of just collecting and analysing statistics. "Fernando's reflective, philosophical approach helped me make more sense of my own findings. It was only when we discussed a 1989 article by David Strachan that had shown how children with many siblings had higher resilience to allergies, that I could tie this in with how very young infants in East German state-run childcare facilities also spent lots of time surrounded by other young children. He was a real inspiration."

Now fuelled by a desire to undertake more creative research into the causes of allergies, von Mutius consolidated the asthma and allergy department at the University of Munich Children's Hospital in 1993. She then attended training courses in clinical effectiveness in the late 1990s at the Harvard School of Public Health in Boston, USA, where she worked closely with Scott Weiss and Patricia Finn, returning there in 2000 to complete her masters in epidemiology, which she says she studied "merely as a tool to further my understanding of allergies". Weiss, Director of the Center for Genomic Medicine at Brigham and Women's Hospital and professor of medicine at Harvard Medical School, says "From her earliest training Erika has had a clear vision of where the field of asthma epidemiology was going and she has worked very hard to be at the forefront of the field, whether it is genetic or early life exposures, she has been a leader."

Having since focused her work on European child allergy and asthma projects, von Mutius' collaborative studies in Germany, Switzerland, and Austria have shown how young children regularly exposed to farmyard dirt and dust develop much less hay fever and asthma. Another project, GABRIEL, launched in 2006, involves over 150 scientists from 14 European countries and 40 000 participants to try to identify the genetic and environmental causes of asthma.

Today, von Mutius is a member of two scientific advisory boards and five major allergy-related organisations, including the International Study of Asthma and Allergies in Childhood. Although she sees patients each week, von Mutius spends most hours researching. Her dream, she says, is to fully understand the specific natural protection factors governing allergies and explore whether a vaccine can be found. She may well succeed. For her former "mentor", Martinez, her creative yet practical approach makes von Mutius unique: "In stereotypical terms, Erika has Latin passion and German practicality. In science that's a winner as you can develop creative new approaches then work with precision to ensure their fruition."

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