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Einstein Foundation Award for Promoting Quality in Research

INTERNATIONAL RESEARCH AWARD — THE 2022 AWARDEES

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Einstein Foundation Award – The 2022 Awardees

Canadian physician Gordon Guyatt and the Psychological Science Accelerator honored as this year's recipients of the €500,000 prize for enhancing quality in research



The Einstein Foundation Berlin is to honor Canadian physician Gordon Guyatt and the Psychological Science Accelerator (PSA) with this year's Einstein Foundation Award for Promoting Quality in Research. Gordon Guyatt is a pioneer in evidence-based medicine and one of the world's most influential medical researchers, having developed best practices for all areas of clinical research that are now applied worldwide, including standards to assess patient health, design and conduct clinical trials, perform systematic reviews, and carry out clinical practice. He is the recipient of this year's international Individual Award, while the 2022 Institutional Award honors the Psychological Science Accelerator (PSA), a network of 1,400 researchers in 71 countries working to improve the quality of psychological research. The PSA promotes internationally networked research in large teams (known as *big team science*) in order to make results reproducible and relevant across all cultures. The winner of the award's Early Career category is the Ape Research Index envisioned by Elisa Bandini (University of Tübingen) and Sofia Forss (University of Zurich). The Ape Research Index will document, for the first time, experience-dependent cognitive flexibility among chimpanzees in research, with the potential to impact how we understand our nearest living relatives, and also ourselves.

The €500,000 Einstein Award for Promoting Quality in Research honors researchers and institutions whose work helps to fundamentally advance the quality and robustness of research findings. "The award is the first to honor efforts to improve research quality," said Martin Rennert, Chair of the Einstein Foundation's Executive Board. "The award's aim is to provide global visibility and recognition for those engaging with this challenge. For the Einstein Foundation, the prize is an opportunity to help raise standards, increase the efficiency of research quality evaluations, and strengthen trust in science and research in general."

The award is presented in three categories to individual researchers, institutions, and early career researchers. Awardees are selected by a prestigious international jury of renowned researchers representing the natural sciences,

the humanities, and the social sciences. "Gordon Guyatt's achievements perfectly reflect the award's objective" said jury member Alastair Buchan, Einstein Visiting Fellow and Professor of Stroke Medicine at Oxford University. "His pioneering work in evidence-based medicine has had a tremendous impact on the quality of clinical research, health care, and health care policy." "This year's institutional awardee, the Psychological Science Accelerator, has developed a unique transformative approach to raise scientific standards by ensuring that research is truly diverse and democratic," commented jury member Dorothy Bishop, Emeritus Professor of Developmental Neuropsychology at Oxford University.

Alongside Dorothy Bishop, Alastair Buchan, and jury president Dieter Imboden, former President of the Research Council of the Swiss National Science Foundation, this year's award jury includes Marcia McNutt, President of the National Academy of Sciences of the United States, Julie Maxton, Executive Director of the Royal Society, Alvin Roth, winner of the Nobel Prize in economics, the science historian Lorraine Daston, the philosopher Moshe Halbertal, the computer scientist Michel Cosnard, economists Lena Lavinas and Edward Miguel, the psycholinguist Suzy Styles, the social scientist Soazic Elise Wang Sonne, the entomologist Raghavendra Gadagkar, and Jürgen Zöllner, former Senator for Higher Education and Research of the State of Berlin, now representing the Damp Stiftung.

The award is generously funded by the Damp Stiftung. Additional resources are made available by the State of Berlin.

The award office is headed by Ulrich Dirnagl, Founding Director of the QUEST Center at the Berlin Institute of Health (BIH). The QUEST (Quality, Ethics, Open Science, Translation) Center, the Max Planck Foundation, and the Public Library of Science (PLOS) are supporting the Einstein Foundation in establishing the award. The Staatsbibliothek zu Berlin and the Klaus Groth Stiftung are award ceremony partners.

About the award winners:

Individual Award | Gordon Guyatt, McMaster University

Gordon Guyatt is Professor of Health Research Methods, Evidence, and Impact at McMaster University in Hamilton, Canada, and one of the world's most-cited medical researchers. Since the 1980s, Guyatt has been working to ensure that medical practitioners base their treatments on high-quality studies and that medical students are trained to critically assess such studies. In 1991, Guyatt introduced the concept of evidence-based medicine to overcome established notions of medicine based on intuition, tradition, and authority. Instead, he wants treatments to rely on evidence and quality standards, such as randomized controlled trials and systematic reviews. With his commitment to promoting evidence-based medicine, Guyatt has initiated a cultural shift in medical practice that also benefits patients. The winner of the Individual Award receives €200,000.

Institutional Award | Psychological Science Accelerator

Founded in 2017, the Psychological Science Accelerator (PSA) has been making key contributions to the democratization and diversification of psychological research. Adopting a collaboration-based approach (referred to as *big team science*), the network brings together scientists from more than 70 countries — from PhD students to senior researchers — to conduct large-scale projects. It thus provides a framework for researchers to carry out studies and trials with thousands of participants (in some cases from more than 80 countries) that deliver reliable results and are relevant across cultures. Its democratic approach also determines the choice of research topics, which are suggested by PSA members and collectively voted on. The concept behind PSA has already given rise to several big team science initiatives within psychology, each pursuing their own focus, for instance in behavioral research. The winner of the Institutional Award receives €200,000.

Early Career Award | Shortlist

The jury had nominated four project proposals for the €100,000 Early Career Award.

1. The **Ape Research Index** envisioned by Elisa Bandini (University of Tübingen) and Sofia Forss (University of Zurich) aims to highlight an aspect that has previously been neglected in behavioral experiments involving primates that regularly participate in studies, namely the training effect on their cognitive abilities.

2. The **Open Science Observatory** plans to promote transparent methods in health research and establish continuous monitoring of transparency standards using crowdsourcing and algorithms. The team consists of Tom Hardwicke and Fallon Mody (both from the University of Melbourne), as well

as Robert Thibault and Stylianos Serghiou (both from Stanford University).

3. The **Translated Instruments Validation Initiative** presented by Jessica Flake (McGill University) and Nicholas Coles (Stanford University) aims to increase the reliability of psychological studies around the world by verifying translations into various languages with the help of a global network of researchers.

4. The **TrialsTracker** enables automated evaluations of clinical trials. Nicholas DeVito (University of Oxford) wants to see additional checks integrated into trials, including compliance with specific regulations and early warnings when reporting is required to provide researchers with an effective tool to increase the transparency of their work.

The Einstein Foundation Berlin is an independent, non-profit, science-led organization established as a foundation under civil law in 2009. It promotes international cutting-edge science and research across disciplines and institutions in and for Berlin. In the last thirteen years, it has funded over 200 researchers — including three Nobel laureates — more than 70 projects, and seven Einstein Centers.

The Damp Stiftung was established by Dr. Walter Wübben, the former majority owner of the Klinikgruppe Damp, to fund medical research and teaching as well as social projects. Besides supporting the Einstein Foundation Award for Promoting Quality in Research, the Damp Stiftung also provides funding for the Foundation's Einstein Strategic Professorships.

Further information

www.einsteinfoundation.de/award

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Press Photos

2022 Individual Award Winner: Gordon Guyatt

Einstein Foundation Award winner Gordon Guyatt improved the quality of clinical research and helped bring evidence to medicine. His next mission is bringing patients into the discussion

In the 1970s, patients who were hospitalized after heart attacks were routinely given the same treatment: An infusion of the drug lidocaine, which doctors thought would ward off lethal arrhythmias in the wake of a cardiac event.

As a young doctor on a rotation through a cardiac care center in Toronto, Canada, Gordon Guyatt followed the conventional wisdom. “When I was in training in the mid-80s, I did an intravenous infusion of lidocaine on every patient who came through the door,” he says.

Between 1970 and 1988, 15 different randomized trials — involving nearly 9,000 patients — turned his thinking around. None of them showed that lidocaine was any better at preventing arrhythmia after a heart attack than a placebo. In fact, the cumulative evidence suggested doctors were doing more harm than good.

Forty-five years later, Guyatt often begins lectures with the lidocaine example to prove a point: The history of medicine is full of treatments that were based mostly on guesswork and intuition rather than solid evidence. From hormone-replacement therapy to anti-oxidant vitamins, “a lot of what was taught as fact was based on low or very low-quality evidence you couldn’t substantiate,” he says. “It became evident, as people started doing more high-quality studies, that we had been messing up a lot, and we’d better try to generate higher-quality evidence.”

Now a Professor of Health Research Methods, Evidence, and Impact at McMaster University in Hamilton, Ontario, Guyatt has devoted his career to that cause. His work pushed fellow doctors to base treatments on stronger evidence — particularly randomized control trials, the gold standard of research design. His contributions to evidence-based medicine and clinical epidemiology — including improving the methods of randomized trials, measuring how patients are feeling, systematic reviews, and clinical practice guidelines — have been cited over 300,000 times, making him one of the most-cited living scientists in the world.

It might come as a surprise that medicine has ever been practiced any other way. But until fairly recently, doctors-in-training learned only through an apprenticeship model in which their mentors relied on intuition, tradition, and authority. Those mentors had received little or no training in

recognizing trustworthy from untrustworthy evidence — for instance, they were often unprepared to distinguish between observational studies and randomized trials.

“When I got interested in clinical epidemiology, it became vividly evident we were on sand. There was no foundation for most of what we were doing.”

Oxford University Professor of Stroke Medicine Alastair Buchan, who is part of the Einstein Foundation Award jury, calls it “ego-based medicine”. Guyatt is even less generous, describing the way doctors sitting on prestigious panels made official guideline recommendations as GOBSAT, short for “Good Old Boys Sitting Around a Table”. “When I got interested in clinical epidemiology, it became vividly evident we were on sand,” Guyatt recalls. “There was no foundation for most of what we were doing.”

In the 1980s, Guyatt was named head of the internal medicine residency program at McMaster’s medical school, in charge of designing the curriculum for doctors-to-be. He was determined to raise the standards of clinical evidence. “I thought clinicians should know how to read the literature and distinguish between when there was good evidence for what we do and when there’s little or no evidence,” he says.

When Guyatt and other doctors at Canada’s McMaster University decided to incorporate the concept into their teaching in the 1980s, they realized there was no simple term for what was at the time a revolutionary approach. “When we took it to wards and clinics, people realized it was a different way of practicing medicine than we had all been taught,” Guyatt says.

In 1991, Guyatt coined the term “evidence-based medicine”, a term that stuck. The concept, too, has proved powerful. His work, together with that of other scientists and doctors, has transformed the medical field in the last 30 years. The shift to evidence-based medicine has changed everything, from the way large-scale clinical trials are designed and conducted to the way patients and doctors interact. “He’s had a huge impact on the way medicine is practiced,” Buchan says.

In a pivotal 1992 paper published in the Journal of the American Medical Association entitled “Evidence-based medicine: A new approach to teaching the practice of medicine”, Guyatt and his colleagues laid out the new approach: Residents in internal medicine at McMaster were taught to de-emphasize intuition and unsystematic clinical experience in favor of high-quality evidence like randomized control trials, a model Guyatt hoped others would adopt. “Rather than accept opinion being handed down, the Hamilton group said they wanted to see the evidence,” Buchan says. “That’s had a huge impact on the way medicine was practiced.”

The initial response to the idea was “rage”, Guyatt recalls. “We were essentially telling colleagues, ‘Sorry, guys, you weren’t trained to be a good doctor.’ It wasn’t a very popular position.”

“The word has got out. Evidence-based health policy and education have spread all over the world.”

But evidence-based medicine quickly caught on. Thirty years later, it is standard practice, improving the quality of medicine by bringing the best science to bear on patient problems. “The word has got out,” Guyatt says. “Evidence-based health policy and education have spread all over the world.”

After years of teaching evidence-based medicine to residents, Guyatt recognized that doctors could use some help—most don’t have time to keep up with the scientific literature, even if they have been trained to evaluate its quality. That was part of the reason he helped develop the GRADE approach (Grading of Recommendations Assessment, Development, and Evaluation), a transparent framework for weighing scientific evidence and translating the tradeoffs of any given treatment for patients. Guyatt calls it “a science of how to do systematic reviews”. “Clinicians need to understand what the benefits and harms are,” he says.

By systematically evaluating the quality of clinical trials, the approach had an impact on the quality of the studies themselves. “It defined the way in which things should be evaluated and used this to drive home what was good medicine,” Buchan says.

The next frontier? Finding and testing good ways to bring patients into the conversation. Of course, Guyatt is gathering evidence along the way—work that has him branching out into psychology and social science. “We can still do randomized control trials of one approach versus another,” he says, “and we should.”

2022 Institutional Award: The Psychological Science Accelerator

Human behavior, by default, is a very complicated thing that is hard to capture in small and specific experiments. The Psychological Science Accelerator, winner of the 2022 Institutional Award, has made its name by facilitating large, crowdsourced international studies in all aspects of the discipline and by democratizing and diversifying big team psychological science.

After attending the Society for the Improvement of Psychological Science conference in 2017, Christopher Chartier, Associate Professor of Psychology at Ashland University, Ohio, was inspired to write a blog post about how a “CERN for Psychology” could help tackle the research reproducibility crisis impacting psychology and other areas of science. The post was extremely popular, and within a month, over 100 psychology labs had asked him where they could sign up.

Chartier’s fledgling idea turned into the Psychological Science Accelerator (PSA), a distributed network to enable and support crowdsourced research projects. Five years later, the organization has 2,468 members in 73 countries. Although many of the members are based in Western Europe and North America (around two thirds), 12% are in Eastern Europe, 9% in Asia, 5% in Latin America, and 2% in Africa.

Nicholas Alvaro Coles, now Director of the PSA, was working on his PhD at the University of Tennessee when he helped lead the organization’s first big study on face perception. Similar studies had been carried out in the past, but primarily in Western regions. This initial study, published in the journal *Nature Human Behaviour*, recruited 11,570 participants in 41 countries—an impressive feat given that most psychological science studies typically struggle to recruit more than a few hundred participants and are mostly carried out by White scientists from Western countries.

“As a graduate student, I thought this was a very unique way of collaborating—the most promising way we can tackle the big questions,” says Coles. “That’s why I decided to double down and focus on further building up big team science.”

“What can happen throughout academia is a siloing of expertise into small clusters of individuals who have direct power relationships with one another. What is exciting about the Psychological Science Accelerator is that this is a grassroots network of individuals from across the globe who have come together to try to disrupt that pattern.” (Suzy Styles)

A key distinguishing factor about the Psychological Science Accelerator is its distributed nature and democratic decision-making across the membership. This is one main factor that impressed Einstein Foundation Award jury member Suzy Styles, an Assistant Professor in Psychology at Nanyang Technological University in Singapore, about the organization. “What can happen throughout academia is a siloing of expertise into small clusters of individuals who have direct power relationships with one another,” she explains. “What is exciting about the Psychological Science Accelerator is that this is a grassroots network of individuals from across the globe who have come together to try to disrupt that pattern.”

Coles was appointed Director in early 2021. With funding from Stanford University, he now fully dedicates his time to running the Accelerator. Since he has been in the post, the Accelerator has gone from strength to strength. It now has 12 projects in its portfolio, three published in Nature Human Behaviour, one in PNAS and one in Affective Science, with plans for many more in progress.

The largest study the organization has produced so far involved testing a brief cognitive intervention to improve emotional well-being during the pandemic, one of three large COVID-19-related studies completed by the Accelerator. It involved over 450 researchers, who collected data from nearly 28,000 participants in 87 countries and 42 languages.

Coles explained that in order to attract more members from around the world and make study investigators and participants more diverse, they are trying to identify research questions that are globally relevant. “We don’t want labs to join just so that they can help us solve the questions we’re personally interested in. We want it to be mutually beneficial. Our three international studies on COVID-19 were the most popular among our members, and that’s because they were relevant to everyone.”

“I think that ability to reach into your network, find the experts, and bring them onto the team is a way that any discipline could increase research rigor.”
(Nicholas Alvaro Coles)

The large size and multiple country distribution of the Accelerator network help to ensure members carry out robust and reliable research. Every proposed project can be reviewed by the PSA community, and once a project is started, the network also lends itself to crowdsourcing expertise. “I think that ability to reach into your network, find the experts, and bring them onto the team is a way that any discipline could increase research rigor,” notes Coles.

The organization has also always been welcoming to researchers at all levels of seniority. “You don’t have to have your own lab,” emphasizes Styles. “You might be a PhD student in an under-resourced part of the world and you’re very interested in some of the activities of the Psychological Science Accelerator. You can still contribute what you have and gain knowledge along the way.”

Transparency is a guiding principle for the Accelerator. All data, materials, and code are open, and all proposed studies must be pre-registered before the work even starts. It is also very open about how it spends its funding, with all expenses and balances tracked on a publicly open platform. “To the best of my knowledge, there aren’t many organizations that engage in science where you could go to a website and see exactly how they spent their money,” says Coles.

Until now, the Accelerator has been run mostly by volunteers with limited funding, but this is now starting to change. In 2021, the John Templeton Foundation awarded ex-director and founder Chris Chartier a grant of nearly \$1 million to fund further Psychological Science Accelerator projects and three new personnel positions. As part of a broader project, the John Templeton Foundation also awarded a team led by Michael McCullough and Nicholas Coles funding to partner with the Accelerator on a global study on gratitude. The Einstein Foundation Award will also be a big boost for the PSA.

Despite being a young organization, the Accelerator has already inspired the foundation of other big-team science projects such as ManyPrimates and ManyDogs, focusing on primate and dog behavior, respectively. They were also co-organizers of the first interdisciplinary Big Team Science Conference this year, held virtually in October with more than 450 registrants.

“In the future, we hope to also serve as an incubator, where we work with people who have promising ideas that aren’t yet fully developed,” says Coles. “Particularly if a person is located in a region where there have traditionally been barriers to access, we hope to be able to dedicate resources to helping them develop their idea, make it relevant to the broader Psychological Science Accelerator community, and obtain the funding they would need to pull it off. In doing so, we hope to build a big team science that can be led by anybody with promising ideas — not just those who are fortunate enough to have pre-existing institutional resources to develop those ideas.”

Early Career Researcher Award: 2022 Finalists

Measuring human experience around the globe: Translated Instruments Validation Initiative

Well-being, attitudes towards climate change, beliefs about privacy — psychological experiments across the globe strive to capture the human condition. Engaging in such research requires reliable and valid instruments such as high-quality questionnaires and surveys in many languages. So far, however, “instruments are often translated without an investigation of their reliability and validity,” says psychologist Jessica Flake from McGill University in Montreal. In consequence, the concrete meaning of questions like “How satisfied are you with life?” can literally get lost in translation. To overcome this problem, the scientist proposes the Translated Instruments Validation Initiative (TIVI) together with Nicholas Coles from Stanford University. By pooling resources from thousands of scientists, the initiative aims to develop a database of reliable psychological instruments useable on a global scale. “TIVI will provide an interactive dashboard allowing researchers to download rigorously tested instruments in their language of choice,” Jessica Flake explains. In this way, the psychologists hope to contribute to a more diversified pool of both researchers and study participants.

Monitoring transparent research practices: Open Science Observatory

Transparent research practices help to ensure findings are reliable, verifiable, and reproducible. However, most research is not transparently reported. With the Open Science Observatory, four researchers from the University of Melbourne, Stanford University, and the company Prolaio Inc. are introducing a quality management tool that puts scientific studies to the test. “Transparency underpins research quality, but it’s widely neglected, as the recent deluge of low-quality COVID-19 research illustrates,” team representative Tom Hardwicke explains. To foster change, the project combines crowdsourcing and algorithms to monitor transparent research practices. “The Open Science Observatory will produce maps of the research transparency landscape, enabling us to gauge the health of the academic literature and adapt our efforts towards improving it.” Displaying its findings on a public dashboard, the project team aims to show the positive impact of transparent research practices and help policy makers design and refine transparency initiatives worldwide.

Quantifying the impact of experience: Ape Research Index

Whether it is stage acting or handling a power tool, how well we master a task depends on our previous experiences — and the same applies to our closest animal relatives, the great apes. The idea that practice makes perfect is still rarely considered when it comes to studying the cognitive abilities of great apes. “A lot of research today is carried out with small groups of captive chimpanzees,” says primatologist Elisa Bandini from the University of Tübingen. “These apes are often tested on an almost daily basis, which, in all likelihood, impacts their behavior and cognition.” An experienced chimpanzee will probably perform better on subsequent tasks. However, findings are often generalized to a species-wide level and even used to inform hypotheses on human behavior and cognition. Within the scope of the Ape Research Index (ARI) meta-study, Elisa Bandini and Sofia Forss from the University of Zurich strive to pin down bias by quantifying the impact of an ape’s previous experience in research. “ARI will help researchers in primatology, psychology, biology, and related disciplines assess their findings and provide them with a concrete tool to increase the robustness, transparency, and reproducibility of data.”

Improving clinical research quality: TrialsTracker

Clinical trials are often underreported, or not reported at all, yet remain the bread and butter of decision-making in health care. “Failing to report health research biases our understanding of the benefits and harms of medical interventions,” says Nicholas DeVito. “It leads to research waste, inefficient decision-making, and sometimes real harm to patients.” To make sure reporting requirements are more reliably met, the scientist from the University of Oxford led the development of audit tools as part of the TrialsTracker project. The publicly available platforms offer automated audits of compliance regarding trial reporting in the US and the EU. “It’s a first-in-class tool for clinical trials transparency that provides the public with valuable information, scientists with tools and data, and policymakers with context for their decisions about the regulation of clinical research.” Building on the original idea, DeVito plans to expand the TrialsTracker project with additional data, functionality, and coverage. “Expanded datasets, tools, and services will support scientists and the public with audit data responsive to the evolving research policy environment and thereby guarantee ongoing transparency into the reporting of clinical trials.”