



Policy Advice in a World of Global Challenges: The Role of National Academies

Bärbel Friedrich

Baltic Conference on Intellectual Cooperation

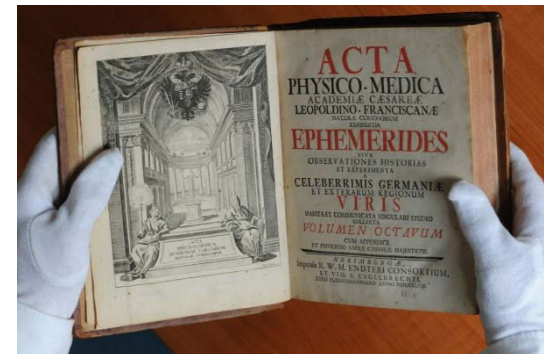
Riga, Latvia, 20 April 2015

A historical view on the Leopoldina

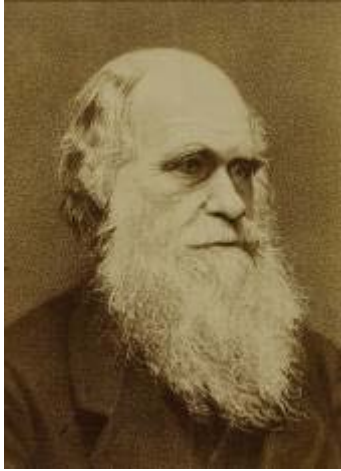


Leopoldina
Nationale Akademie
der Wissenschaften

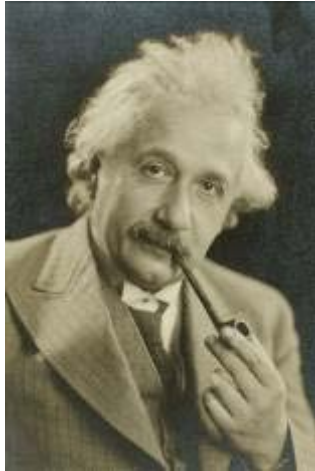
- Leopoldina was founded in 1652 in Schweinfurt (Frankonia). It is the oldest continuously existing academy of sciences worldwide. Since 1878 the Leopoldina resides in Halle (Saale)
- Leopoldina has about 1,500 members including around 500 foreign scholars and 11 % female scientists
- In 1670 the first scientific, still existing journal *Nova Acta Leopoldina* was edited



Distinguished members of the Leopoldina



Charles Darwin



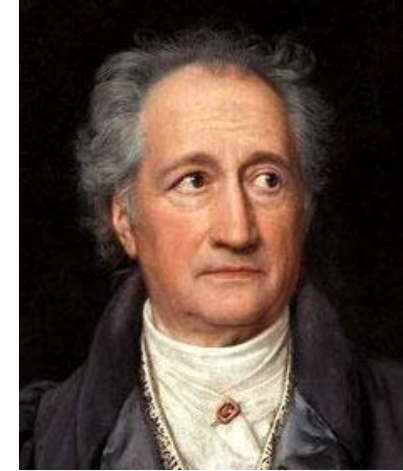
Albert Einstein



Marie Skłodowska-Curie



Alexander von Humboldt



Johann Wolfgang von
Goethe



Max Planck



Christiane Nüsslein-Volhard



Stefan Hell

Currently 30 Noble laureates

Structural changes

- Leopoldina initially focused on medical and natural sciences
- Leopoldina survived difficult times of German history: a substantial brain drain during the National Socialist period and isolation during separation of the country
- Contacts between East and West (1949 to 1990) were maintained through international conferences and a vice president resident in West Germany
- Since German's reunification in 1990 Leopoldina is undergoing structural rearrangements (integration of additional sections, for example technical, informational, behavioural, economic, social and cultural sciences)
- 28 sections are arranged in four classes
 - I. Mathematics, Natural Sciences and Engineering
 - II. Life Sciences
 - III. Medical Sciences
 - IV. Humanities, Social and Behavioural Sciences
- In 2000 the “young academy” was established under the umbrella of the Leopoldina and the Berlin-Brandenburg Academy of Science and Humanities

In 2008 the Leopoldina was appointed as National Academy of Sciences



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Federal Minister of Education and Research Annette Schavan (l), Leopoldina-President Professor Volker ter Meulen (m), German Federal President Professor Horst Köhler (m), Prime Minister of Saxony-Anhalt Professor Wolfgang Böhmer (r)



Main building of Leopoldina in Halle (Saale) since 2012, an office in Berlin near the government center



As National Academy, the Leopoldina has the mandate to:

- represent Germany's scientific community on an international level and in inter-academy relations
- provide independent, science-based advice to the government, policy-makers and society on key issues, covering all scientific disciplines
- maintaining the character of a scholarly society, e.g. organization of symposia, meetings, awards and honours, support of excellent young scientists

Process of generating topics for policy advice

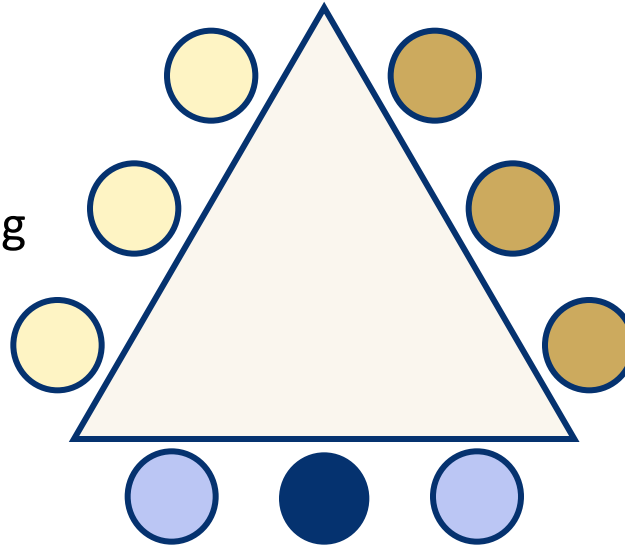


Proposals for policy advice are borne on various levels

- Eight scientific committees consisting of 10 – 20 members and external experts
 - meet regularly and discuss topics of interest for the society and politics
 - submit a short exposé on an adequate issue to the decision-making Presidium
- Also individual members, sections and classes are requested to provide “hot topics” of societal and political relevance
- Presidium and invited guests meet annually for a two-days retreat to discuss challenging scientific issues
- In contact with the government, parliamentarians and NGOs scientific questions are addressed that are of common interest
- Responses to urgent situations of scientific relevance are given quickly, e.g. Epidemics like *Ebola*

The Standing Committee of the Academies

German Academy
of Science and Engineering
acatech



**Union of the
German Academies
of Sciences**
(members rotating,
one permanent representative
of the Berlin-Brandenburg
Academy of Sciences)

**German National Academy
of Sciences Leopoldina**
(Leopoldina president holds the chair)

The inter-academy panel is consulted for contributions and recommendations of issues of concern



Next Step:

Constitution of Working Groups

- Interdisciplinary working groups composed of about 20 appointed members and experts are assisted by science officers of the Leopoldina
- Decision is made on the format of the report: e.g. Full statement of around 100 pages, discussion paper, ad-hoc short reports, recommendations
- Gain of information: workshops, hearings of experts. Final goal is to obtain independent scientifically-based knowledge
- Establishment of a writing group. The text undergoes several rounds of discussion and circulates within the working group
- The Presidium decides whether the manuscript is appropriate for external review or requires revision prior to sending out for independent review (up to 8 reviewers are requested)
- The working group completes revision before the paper is being published

Publication of Statements and Recommendations



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- Press, policy makers, government and science institutions as well as NGOs are usually shortly informed about the forthcoming publication of a report
- The reports are often introduced during a press conference or breakfast or lunch meeting with politicians and journalists
- The reports are open to the public via internet and printed in German and English

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Ecosystem services, agriculture and neonicotinoids (2015)
There has been considerable controversy in recent years over the effects of neonicotinoids on honey bees, culminating in a European Commission regulation in 2013 restricting certain uses of...

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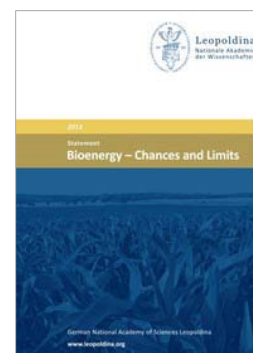
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www.leopoldina.org/en/publications/statements-and-recommendations

Selection of recent National Reports (103 in total)



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- **Statement on progress of molecular breeding and on the possible national ban on cultivation of genetically modified plants (2015)**
- Socialisation in early childhood (2014)
- **Individualised Medicine – Prerequisites and consequences (2014)**
- **Report on tomorrow's science - Life sciences in transition (2014)**
- On designing communication between the scientific community, the public and the media (2014)
- Scientific freedom and scientific responsibility (2014)
- Clinical trials with medicinal products on humans (2014)
- **Antibiotics research: Problems and perspectives (2013)**
- A Future with Children (2012)
- Bioenergy – Chances and limits (2012)
- More Years – More Life (2009)
- Synthetic Biology (2009)

Cultivation of genetically modified plants (Ad-hoc Statement, April 2015)



Statement, 26 March 2015

Academies issue statement on progress in molecular breeding and on the possible national ban on cultivation of genetically modified plants

Summary

Since the mid-1990s, cultivation of genetically modified plants has been increasing steadily. These plants differ from the original cultivars in that genes are deliberately introduced into the plants, or existing genes are deliberately modified. This intervention may lead, for example, to increased resistance to pests or adaptations in the composition of vitamins and storage compounds such as starch and fatty acids. In 2014, *genetically modified organisms* (GMOs) were grown on 13 percent of the world's farmland. Science-based data show that the use of GMOs can result in increased yields, higher incomes for farmers, and reduced use of insecticides. The international trend towards increased GMO cultivation is clearly visible; however, it conflicts with the political and legal situation in Germany, where field tests and commercial cultivation of genetically modified plants are no longer taking place.

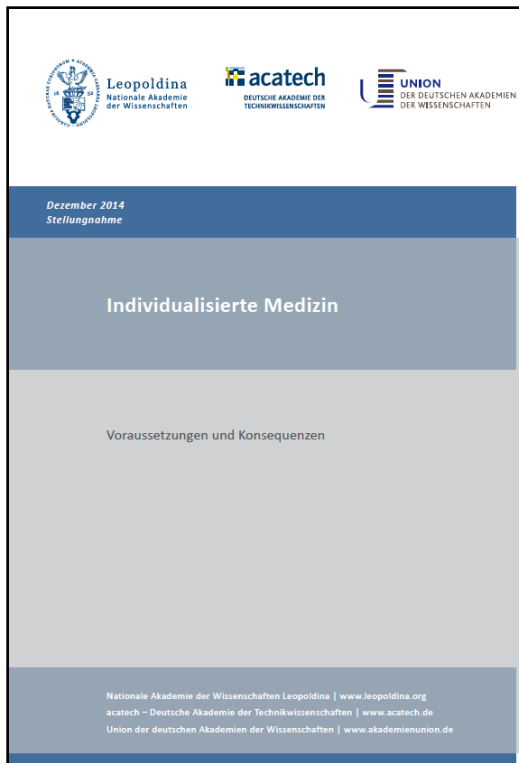
It is questionable whether the regulations under the German Genetic Engineering Act, which are linked to specific types of genetic modification, are still practicable and appropriate. The breeding products of some new molecular genetic methods can hardly be distinguished, or cannot be distinguished at all, from the products of non-regulated techniques that are considered *conventional* breeding. Moreover, similar plants can be produced using traditional breeding methods, but those methods are less efficient and take much longer.

The German National Academy of Sciences Leopoldina, acatech – the National Academy of Science and Engineering, and the Union of the German Academies of Sciences and Humanities strongly recommend that future risk assessment should be based primarily on the specific characteristics of new plant cultivars and not on the process by which they are produced. The Academies argue against a general ban on GMO cultivation, which is not scientifically justified. The Academies consider such prohibitions in Germany an acute threat to freedom of research and professional freedom, to property protection and general freedom of action, and thus to opportunities for studying, developing and commercially utilising genetically engineered crop plants. Therefore, the German academies emphatically recommend a science-based evaluation on a case-by-case basis. Moreover, field trials are indispensable for risk assessment of GMOs, especially following a deregulation procedure.

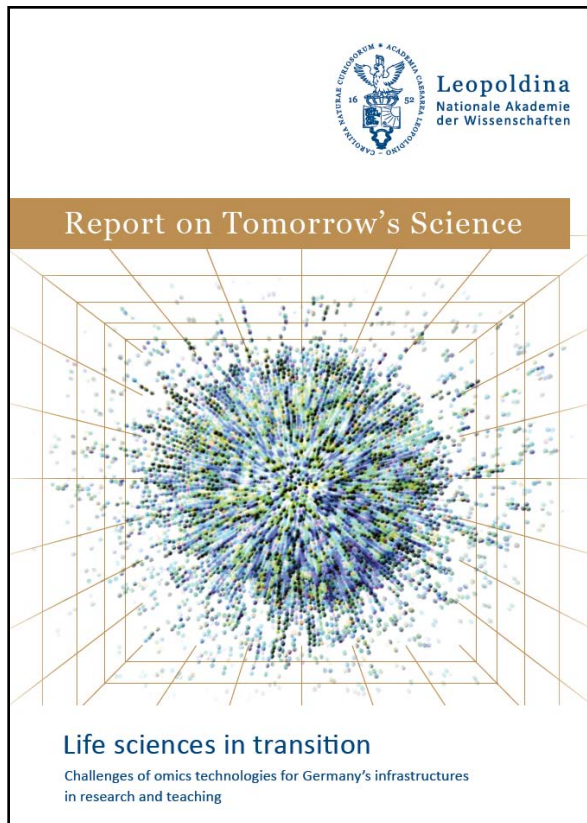
- Consequences of novel molecular genetic breeding techniques
- German and European regulatory systems for GMOs should base future risk assessment primarily on the specific characteristics of new plant cultivars and not on the techniques by which they are produced
- Field trials are necessary for research, banning the cultivation of GMOs means a severe restriction of freedom of science

Individualised Medicine - Prerequisites and Consequences

(Statement, December 2014)



- Individualized medicine opens novel science-based dimensions of understanding, diagnosing, treating and predicting diseases
- Likewise it raises a number of ethical, legal and economic concerns
- What are the prerequisites and consequences for implementing individualized medicine into our health care system?



Life Sciences in Transition

Challenges of omics technologies (genomics, transcriptomics, proteomics, metabolomics, etc.) and bioinformatics (big data) for Germany's infrastructures in research and teaching

Antibiotics Research: Problems and Perspectives (Statement, January 2013)

ANTIBIOTICS RESEARCH: PROBLEMS AND PERSPECTIVES

Statement

Academy of Sciences and Humanities in Hamburg
German National Academy of Sciences Leopoldina



AKADEMIE DER
WISSENSCHAFTEN
IN HAMBURG

- Relevant to both human and veterinary medicine and a global matter of concern
- What are the consequences of increasing antibiotic resistances?
- How can future research contribute to solving the problem of resistance and the lack of new antibiotics?
- What regulatory and financial framework conditions are required to ensure that research results find their way into application more quickly?
- Proposals for research, industrial and legal treatment

➤ Establishment of a round table

Collaboration with International Academy Networks



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- European Academies Science Advisory Council
- The global network of Science Academies
- Federation of the European Academies of Medicine
- All European Academies
- Network of the G7 Academies



- EASAC is a cross-border association of EU-National Academies
- Elaboration of science-based statements on questions of political relevance in the EU and beyond
- Main addressees are the EU-Parliament and the EU-Commission
- EASAC office is hosted by the Leopoldina in Halle (Saale)
- **Recent Statements:**
 - Ecosystem services, agriculture and neonicotinoids (2015)
 - European Space Exploration - Strategic considerations of human versus robotic exploration (2014)
 - Management of Nuclear Fuel and its Waste (2014)
 - Risks to Plant Health - European Union priorities for tackling emerging plant pests and diseases (2014)
 - Trends in extreme weather events in Europe (2013)
 - Planting the Future - Opportunities and Challenges for Using Crop Genetic Improvement Technologies for Sustainable Agriculture (2013)
 - Carbon Capture and Storage in Europe (2013)



- Iap closely interacts with its member academies to strengthen the role that science plays in society and to advise public officials on the scientific aspects of critical global issues
- Helps to establish science academies in countries where academies do not yet exist. Iap tries to support young and small academies to make them popular in their own countries
- Sponsors programs for young scientists career development. Attracts and engages decision makers
- **Recent statements:**
 - IAP Statement on Realising Global Potential in Synthetic Biology: Scientific Opportunities and Good Governance (2014)
 - IAP/IAMP Statement on Antimicrobial Resistance: A Call for Action (2013)



Memoranda of Understanding:

- Indian National Academy of Sciences (INSA) · 2007, 2012
- Russian Academy of Sciences (RAN) · 2011
- Korean Academy of Science and Technology (KAST) · 2012
- Académie des Sciences · 2013
- Academy of Science of South Africa (ASSAf) · 2013
- Israel Academy of Sciences and Humanities · 2013

Participation in the bilateral “Years of Science”



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- **Germany+India 2011-2012 | Infinite Opportunities**
 - Leopoldina-Lecture „Challenges for the Engineering Sciences“, NK Gupta & M. Kleiner, Halle, November 2012
- **German-South African Year of Science 2012/13**
 - Symposium „Technological Innovations for a Low Carbon Society“, Pretoria, October 2012
 - Symposium „Socio-Ecological Novelty – Frontiers in Sustainability Research“, Berlin, March 2013
- **German-Turkish Year of Research, Education and Innovation 2014**
 - Science Bridging Nations
 - German Turkish Science Talks (in cooperation with the Alexander von Humboldt Foundation)



G7 Summits' recommendations by national academies (Formerly G8)

2012 Camp David, USA

- Improving knowledge of emissions and sinks of greenhouse gases
- Energy and water linkage: challenge to a sustainable future
- Building resilience to disasters of natural and technological origin

2013 Lough Earne, United Kingdom

- Driving sustainable development
- Drug-resistance in infectious agents

2015 Schloss Elmau, Germany

Academies drafted statements on three topics:

- Resistance to antibiotics
- Neglected and poverty-related diseases
- Future of the world's ocean



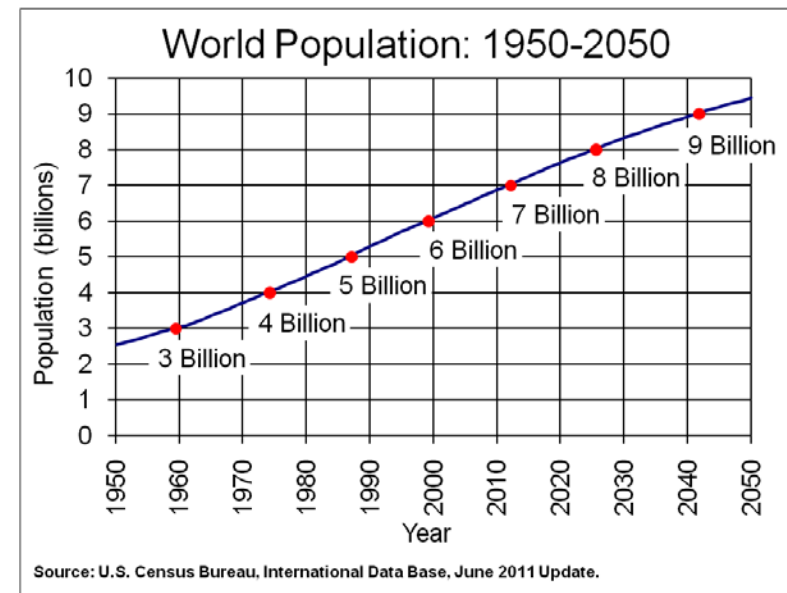
G7 GERMANY
2015 | Schloss Elmau

Global challenges of ongoing concern



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- Climate change
- Population growth
- Mobility, migration
- Misuse of scientific data („dual use“)
- Health system (antibiotics)





Humboldt university of Berlin

Thanks for your attention



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Bärbel Friedrich

Baltic Conference on Intellectual Cooperation

Riga, Latvia, 20 April 2015



G-SCIENCE ACADEMIES STATEMENTS 2013



Drug Resistance in Infectious Agents – A Global Threat to Humanity

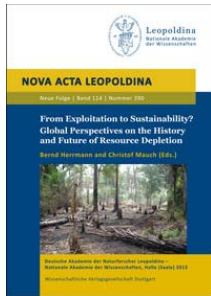


Antimicrobial Resistance: A Call for Action



Process of generating policy advice

- Organisation of high-level national and international symposia and conferences.
- Organisation of public **Leopoldina-Lectures**
- Conferring recognition for scientific excellence
- Promotion of young scientists: **Junge Akademie** and Young Scientists Forum
- Establishment of interdisciplinary workgroups to elaborate statements and recommendations (nationally and internationally)
- Interaction with other national academies and active participation in international bodies (i.e. IAP, G-Science, EASAC etc.)



National statements and recommendations

- Antibiotics Research: Problems and Prospects (2013)
- Advancement of the German Science System (2013)
- Demographic change:
 - More Years – More Life (2009)
 - Future with Children (2012)
- Energy:
 - Post-Fukushima Energy and Policy Recommendations (2011)
 - Bioenergy: Chances and Limitations (2012)
- Biosciences:
 - Animal Experiments in Research (2012)
 - Preimplantation Genetic Diagnosis (2011)
 - Synthetic Biology (2009)
 - New Methods of Stem Cell Research (2009)

