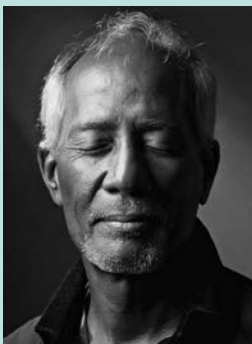
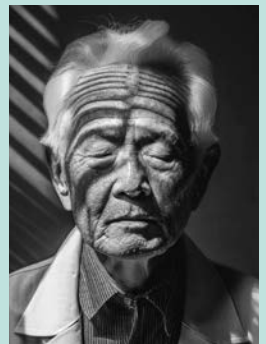
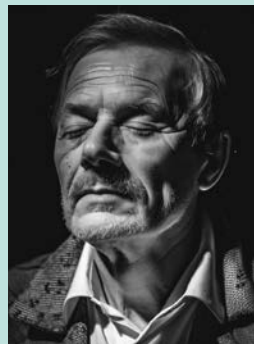
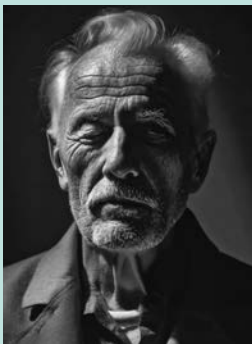
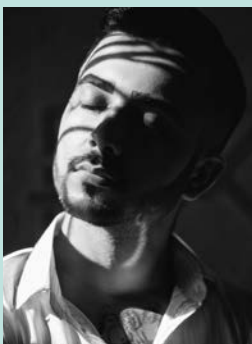


MAGAZINE

of Heinrich Heine University Düsseldorf



XY – now resolved
Clarity in the genome



MEDICINE
**Targeting
leukaemia**

ENGLISH STUDIES
**Tales of the
Konkomba**

LAW
**Money laundering
in Germany**

hhu.



According to estimates, one hundred billion euros are laundered in Germany every year. A topic for criminal law expert Professor Dr Till Zimmermann.

Title

- 12 **XY – now resolved**
Clarity in the genome

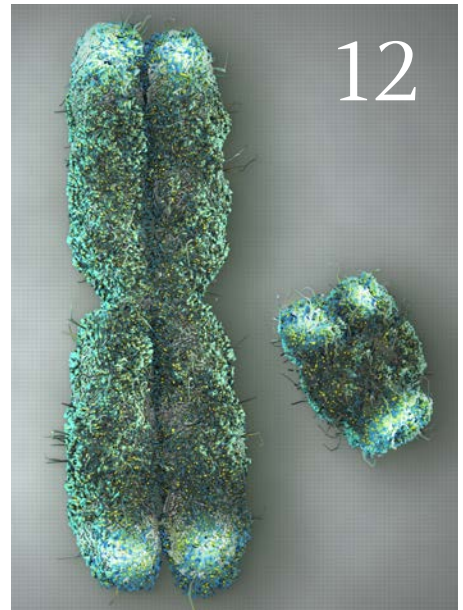
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Scientists at HHU have succeeded in reconstructing 43 Y chromosomes from different populations worldwide.

Legal notice

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Editorial



Dear Reader,

Decoding the human genome is a challenge for humanity in the truest sense of the word. Sequencing and reconstructing the Y chromosome are part of this epochal project, in which many scientists worldwide are involved – including researchers from Heinrich Heine University, namely Professor Tobias Marschall and his team (NB: Even though we share the same surname, there are – as far as I am aware – no familial genetic overlaps between the two of us). Genomics benefits significantly from innovative data collection and data analysis methods developed in the field of artificial intelligence (AI). AI has also generated the photos of the people shown on the cover – these persons do not actually exist. All this underlines once again how advanced artificial intelligence has become – what good it can do, yet also where risks lie. It is therefore to be welcomed that the European Union is taking steps to regulate the use of AI.

I would also specifically like to draw your attention to a second article in the Magazine – coming from the area of culture and translation studies. It looks at the Konkomba, a small ethnic group living in the Ghana/Togo border region and at the fables and stories passed down through the generations of these people. The Centre for Translation Studies has taken on the task of gathering and translating these stories.

At HHU, we are in fact in the process of placing a stronger focus on Africa and expanding our cooperation with African partners, for example within the framework of the NRW-Ghana University Alliance, of which HHU is a member. This cooperation offers great potential. In the current times in particular, the idea of intercultural exchange, international encounters and openness is more important than ever before. HHU is committed – also in the spirit of its namesake – to remaining a place where we teach and learn, research and live together peacefully in mutual respect and tolerance.

I wish you an enjoyable read!

Kind regards,

Professor Dr Stefan Marschall
Vice President for International Relations and Science Communication

Coming and going

Women in top management

BY CAROLIN GRAPE

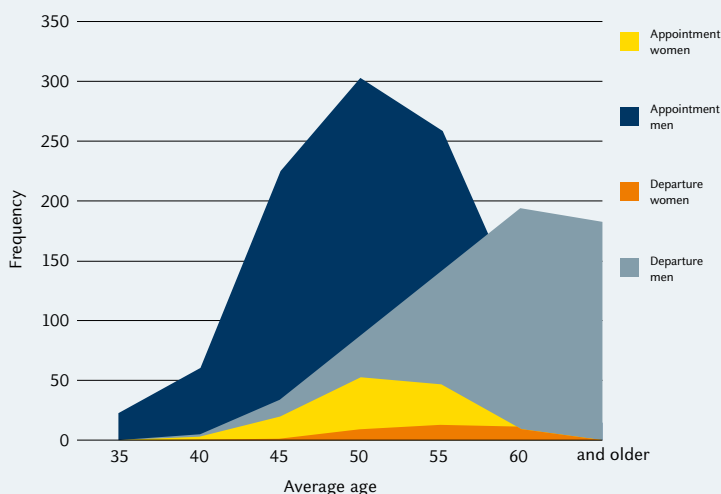
New laws and new management methods are bringing change to German companies: More and more women are being appointed to executive and supervisory boards. However, according to a recent study by Dr Janine Maniora, professor of business administration, women leave their executive board seats on average more quickly than their male counterparts.

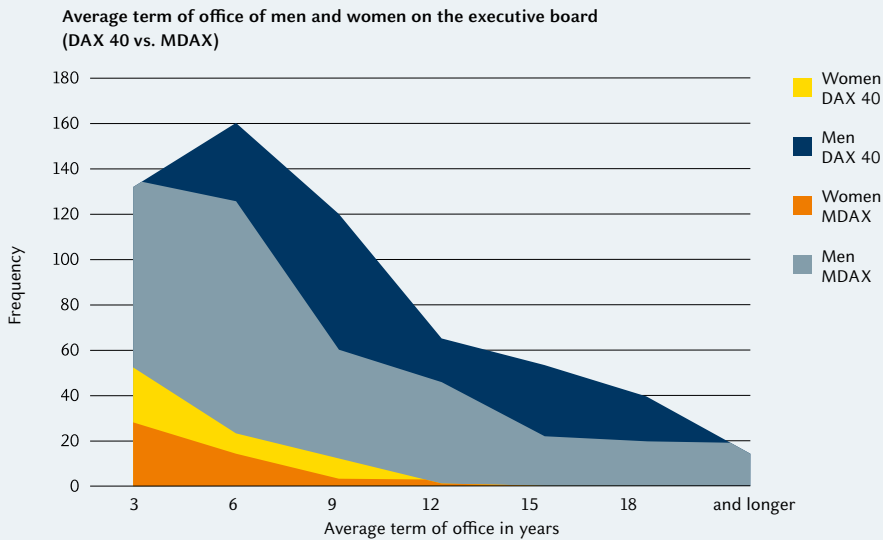
Since the introduction of a statutory women's quota in the Acts on Equal Participation of Women and Men in Management Positions in the Private and Public Sectors (Führungspositionen-Gesetze – FüPoG) I (2015) and II (2018), the proportion of women in top management positions has increased, according to the German-Swedish AllBright Foundation. The foundation works to promote more women and diversity in executive business positions and analyses developments on a regular basis. According to the current AllBright report (June 2023), almost one in five executive board members in major German companies are currently women. For the first time since the end of 2022, more women than men have been appointed to executive board positions in the DAX 40. The ratio currently lies at almost 23%. In the medium-sized stock corporations listed on the MDAX, the proportion of women on executive boards has risen from 11.7 to currently 13.7%. However, around half of all MDAX companies are still managed by men only. New figures give cause for hope: They show that young women are promoted to executive positions as often as men and in some cases even have better chances of promotion. However, this is only the case when they work full time.

Is there a systematic approach behind the departures of prominent female board members?

One thing that stands out: The number of women leaving top-level positions has increased in the past year. Three examples: Carla Kriwet stood down as Chief Executive Officer of the DAX company Fresenius Medical Care after just 66 days. Chief Financial Officer Tanja Dreilich

Average age of men and women when they join and leave the executive board (DAX 40 and MDAX)





left the Hamburg-based logistics company HHLA after just six months. Sabine Bendiek resigned as Chief People & Operating Officer and Labour Relations Director of SAP after three years. Some of the women resigned, while others were forced out or simply fired. Is there a systematic approach behind the reported departures of prominent female board members from major German companies?

“On behalf of the Sunday newspaper *Frankfurter Allgemeine Sonntagszeitung*, we have examined the term of men and women that served as management board members in major German companies between 2010 and 2023 – namely, all companies listed on the DAX and MDAX – with a total of 1,142 board members including 137 women,” explains Janine Maniora from the Chair of Business Administration, esp. Financial Accounting.

The length of time men and women spend on executive boards differs significantly

The most important result of the study: With an average term of office of 6.45 years, executive board members at DAX 40 and MDAX companies now generally spend less time at companies than in the past anyway, but there is one critical difference: On average, women leave the board more than twice as quickly as their male colleagues. Our study shows: The average man remains on the board of management for six years and eleven months, the average woman only three years and two months,” continues Professor Maniora, adding: “That could however change in the future as a result of FÜPoG II.”

There can be a number of reasons why female board members leave their positions more quickly. Several are well known: Some women are still promoted to board

level too quickly, meaning that they do not possess the necessary experience on such bodies. And yes, women still come up against a male-dominated communication culture, which women can struggle with.

New explanations have also emerged as a result of developments over recent years: “Many companies have failed to implement a systematic executive development system for women. Due to the lack of internal candidates, women are often brought in from other companies – and consequently lack internal knowledge and a network within the company. They are also still frequently appointed to administrative functions (CFO, CTO, CHRO) – and there they also leave more quickly. Public interest in women increases the pressure on them in general and failures attract greater attention. And finally: Successful women are head-hunted more quickly,” the expert summarises.

Ultimately, it is largely down to the fact that companies have too few women in the pipeline. When there are more women on executive boards, they will also stay longer.

“Our study shows:
The average man
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Professor Janine Maniora — business administration expert

Targeting leukaemia

Predicting effectiveness in advance to find the right medication

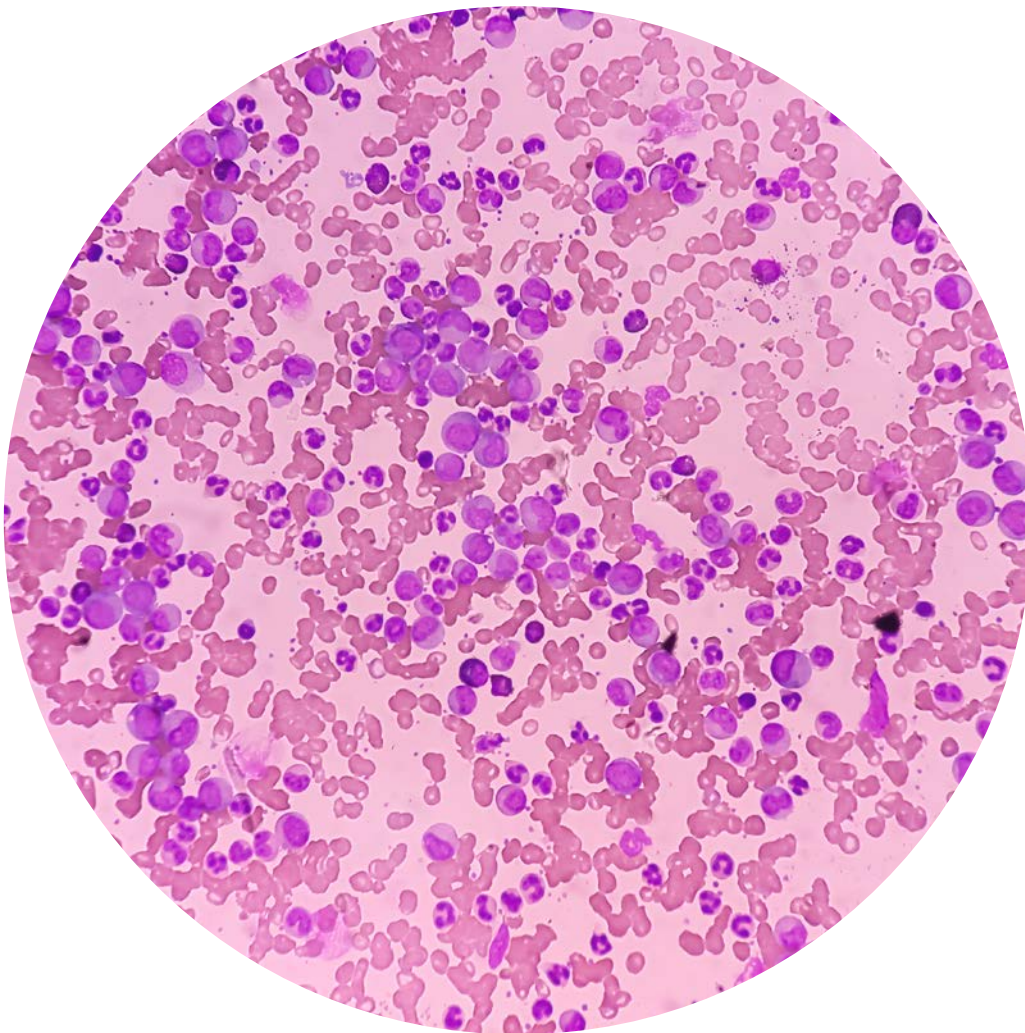


PHOTO ISTOCKPHOTO - MD BABUL HOSEN

Diagnosis: Leukaemia. First of all, a shock for patients, while the doctors treating them are “spoiled for choice” as it were, because it cannot always accurately be predicted which chemotherapy will be effective. The solution to date: If at first you don’t succeed, try, try again. This takes time and is hard for patients. Led by Professor Dr Sascha Dietrich, head of the Department of Haematology, Oncology and Clinical Immunology at University Hospital Düsseldorf, three researchers from HHU have now conducted a “Drug Response Profiling” trial, which enables the effectiveness of potential medication to be predicted in advance in the test tube.

BY SUSANNE DOPHEIDE

Although many resistance mechanisms and prognostic markers are known today, being able to test how effective a treatment would actually be for the individual patient before starting the therapy would be a big step forward. And it would be even better if this test were non-interventional. The aim of the SMARTrial was to determine exactly how accurate this drug profiling is. “The direct examination of primary leukaemia and lymphoma cells with potential medications that we tested here can make a significant contribution to predicting therapy response and the most effective therapy for the individual,” says Sascha Dietrich.

The trial, which has just been published in the scientific journal “Nature Cancer”, examined the application of Drug Response Profiling in more detail. In this case, profiling means testing whether a patient will respond to a certain chemotherapy medication before the actual treatment. To this end, cancer cells are taken from the patient by means of blood samples, bone marrow punctures and biopsies, and tested outside the body (*ex vivo*) under laboratory conditions with a wide range of potentially effective medication. “Using mathematical models, we then compared the potential therapy success of a wide variety of medication options,” explain the lead authors of the Nature publication, Dr Nora Liebers and Peter Martin Bruch from the Department of Haematology, Oncology and Clinical Immunology. “We were able to show that we could predict the effect of various chemotherapies in particular by means of the *ex vivo* tests.”

Automated pipetting process

Such broad-based screening, in which a significantly higher number of medication options can be trialled in the test tube than could be given to patients, is made possible by highly automated pipetting processes. These processes enable hundreds of tests to be conducted in parallel with a high degree of accuracy.

On average, the Drug Response Profiling results were available within three days. “That would also make this test suitable for use in day-to-day clinical operations as, for example in the case of aggressive haematological cancers, therapy decisions usually have to be taken very quickly,” says Dietrich.

“This therapy was highly effective and enabled the patient to undergo a stem cell transplantation, which has also proven effective in the long term.”

Professor Sascha Dietrich — haematologist oncologist

In the case of patients with acute myeloid leukaemia (AML), the largest individual group in this study, it was also possible to predict the response to the standard therapy with the medications daunorubicin and cytarabine beyond the already known genetic risks. In particular, patients with an adverse risk profile benefitted from the profiling.

Personalised therapy

Dietrich reports on a trial participant with aggressive lymphoma. Following the failure of all standard therapy options, he was treated with a personalised therapy based on the *ex vivo* medication response of his cancer cells. “This therapy was highly effective and enabled the patient to undergo a stem cell transplantation, which has also proven effective in the long term,” says the oncologist. “Further trials are of course necessary to establish the precise value of this technique in clinical applications, but this work is an important step towards fully personalised leukaemia therapy.”

PUBLICATION

Liebers, N., Bruch, PM., Terzer, T. et al.

Ex vivo drug response profiling for response and outcome prediction in hematologic malignancies: the prospective non-interventional SMARTrial.

Nature Cancer (2023)

→ <https://doi.org/10.1038/s43018-023-00645-5>



Once upon a time

Stories of the Konkomba are being recorded in an Anglicist project

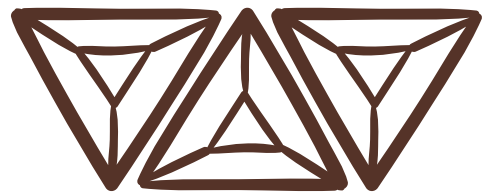
BY VICTORIA MEINSCHÄFER

Fairy tales, sagas and other stories are part of written literature in Europe. Although it is clear that they were passed on orally in the past, it is also a matter of course that you can read them. Or have them read to you. But what about African stories? More precisely: the folktales of the Konkomba, a small ethnic group living in the Ghana/Togo border region? Tasun Tidorchibe is working to record these folktales at the Centre for Translation Studies.

Tidorchibe, a Konkomba himself, studied English literature at the Kwame Nkrumah University of Science and Technology in Kumasi. He explains that, after completing his master's, it became clear to him that the folktales he had heard in his village as a child were considered literature, albeit a kind passed on orally. Initially for his own pleasure, he began a project: He encouraged relatives and acquaintances to tell him folktales over the phone and recorded them. As the corpus grew, it became clear to him that this could be a topic for a doctorate. He was interested not only in the content and form of the tales, but above all the question of whether and how they could be translated into English. Yet, did he have the right to do this? "I am a Konkomba myself, but in my work I am taking the liberty to record something that has so far only been passed on orally," he says, describing his doubts.

At Heinrich Heine University, Tasun Tidorchibe found an interested supervisor in Professor Dr Eva Ulrike Pirker. "The mark that other languages and oral narrative cultures have left on Anglophone literature worldwide should not be underestimated. At the same time, we lack access to them. I was inspired by Tasun

Tidorchibe's project as it offers exemplary access and takes oral narrative culture seriously as a literary tradition." The research is accompanied by the project "Demarginalising orature: Translating minor forms into the digital age". In a course funded by the ELFF and Digital Humanities over a period of two years, Tidorchibe and three student assistants have assembled a multimedia collection comprising folktales, their translations and explanatory notes. The aim is to make the tales accessible to the international research community as well as to a wider audience in a culturally sensitive translation and a digitally readable format. Pirker points to the problems inherent in every literary translation and





Folktales are told to a large group of listeners – and the audience is often involved.

“Men and women usually tell stories as entertainment, either when everyone is sitting together at leisure or when a larger group needs to complete a tedious manual task.”

Tasun Tidorchibe — anglicist

transposition to another language: “First of all, there is an ethical issue: Do we indeed have the right to record and provide fixed, textual versions of stories, which are passed on orally and which every storyteller can modify slightly?” Tidorchibe has found a good solution to this issue, as his recordings are primarily audio files. The tales told by various individuals are stored in a database with English subtitles. This allows the oral nature of the tales to remain clear, but the danger of the narrative becoming fixed remains. “Men and women usually tell stories as entertainment, either when everyone is sitting together at leisure or when a larger group needs

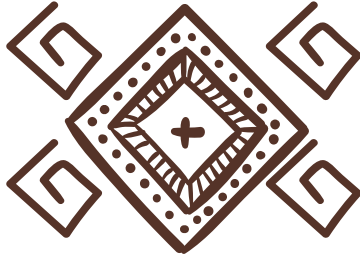


PHOTOS EMMANUEL TASUN TIDORCHIBE

to complete a tedious manual task.” Someone then always tells a story and they often do not do so alone, but rather also involve the audience.

The limits of translation

With every translation into English, there are of course limits as to what can actually be translated. “English, the language of colonisation, does not offer adequate solutions for some words,” Pirker says. “*Ubor*” is one example, which is often translated as “chief”. “However, this creates a false sense of hierarchy, as the word describes different functions, which the English word ‘chief’ does not express correctly.” This led Tidorchibe to keep some words in the source language. This practice touches on a familiar debate in the world of translation: Translations extensively adapted to the target language are described as “domesticated”, while leaving untranslatable words in the source language is referred to as “foreignization”. The latter is often more



is already only spoken by a small number of people. The project comprises around 100 tales collected by Tidorchibe in Likpakpaln, the language of the Konkomba. Around 1.2 million Konkombas still live in Ghana and Togo today and around half of them speak Likpakpaln fluently. Making the tales known in English may inadvertently put the language even further at risk.

Stories illustrate moral behaviour

literal, but has an impact on readability. “We are trying to find a good middle way,” says Tidorchibe. “We are translating them into English but are drawing attention to the boundaries and difficulties of translation.” Anne Schulzki and Michael-Zane Brose, two student assistants working on the project, are convinced that the disruptions caused by the words that cannot directly be understood are meaningful and important. They feel that it is good to leave certain terms in the source language and raise awareness of the challenges of translation.

Pirker points to another problem: When the tales are translated, it is not only the case that the meaning may be changed in some places, but also that the tales then have a new, independent existence in a much more powerful language, namely English. The practice may thus add to marginalising the original language, which

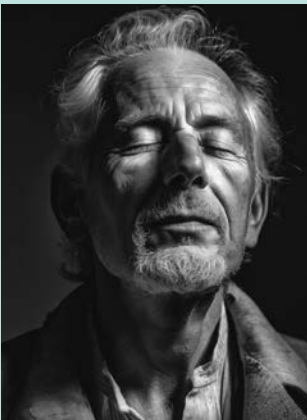
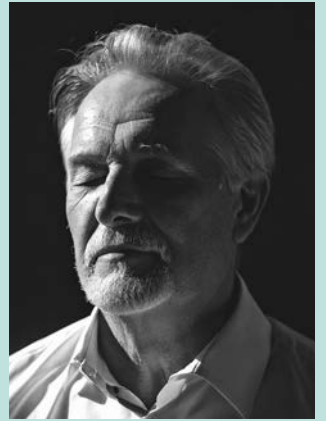
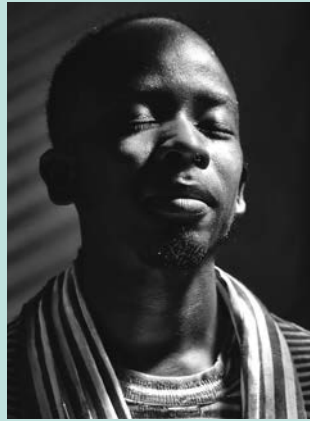
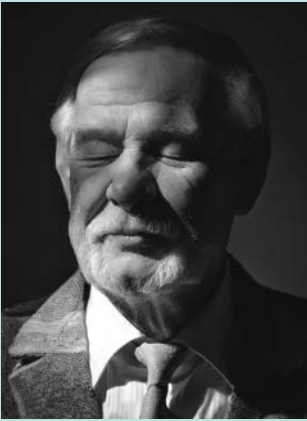
And what do the Konkomba tales contain? “They have more in common with fables than with German fairy tales,” says Tidorchibe. They usually end with a moral lesson. Some even begin with one, for example when a story is told to illustrate a specific behaviour. Animals play an important role and, as in many folktales across the globe, there are not only speaking animals, but also speaking plants or inanimate objects. What makes them significantly different from the fairy tales of the Grimm Brothers? “Our folktales are not as ‘romantic’. They do not end with the prince marrying the princess and everyone living happily ever after.”

MORE INFORMATION

→ blogs.phil.hhu.de/ctsdus/demarginalising-orature

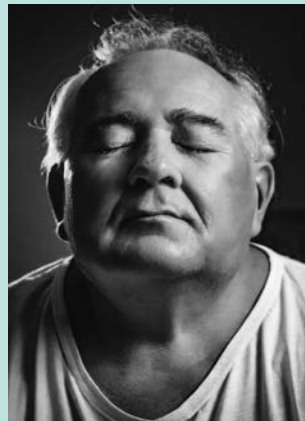
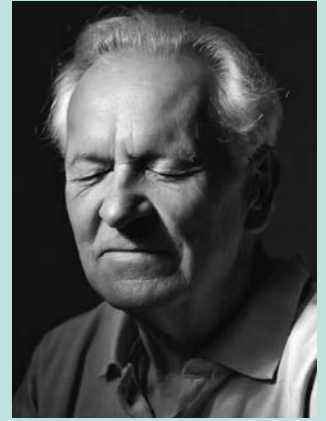
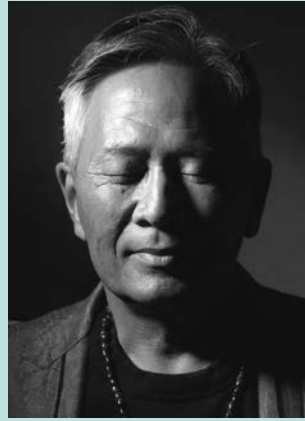


Fascinated children and young people from a village listen to a storyteller.





PHOTOS: MIHU / PAUL SCHWABERER / ADOBE FIREFLY



Clarity in the genome

XY – now resolved

BY SUSANNE DOPHEIDE

Following the complete reconstruction of a human genome in 2022, the Y chromosome was the last blind spot in the human genome. It is more difficult to analyse than all other chromosomes. It is also tiny and – yes: knobbly. Dr Peter Ebert, head of the Core Unit Bioinformatics, and Professor Dr Tobias Marschall, director of the Institute of Medical Biometry and Bioinformatics, have now succeeded in reconstructing 43 Y chromosomes from various populations around the world as part of an international research collaboration.

The structure and analysis of the human Y chromosome have now been published in two articles in the scientific journal “Nature”. The work closes many gaps to existing data and provides an insight into the development and variation of the male sex chromosome in different populations. These new reference genomes not only provide a reliable framework of reference for comparative gene analyses – such as within the context of medical diagnostics – but are also a prerequisite for further developments in “personalised medicine”.

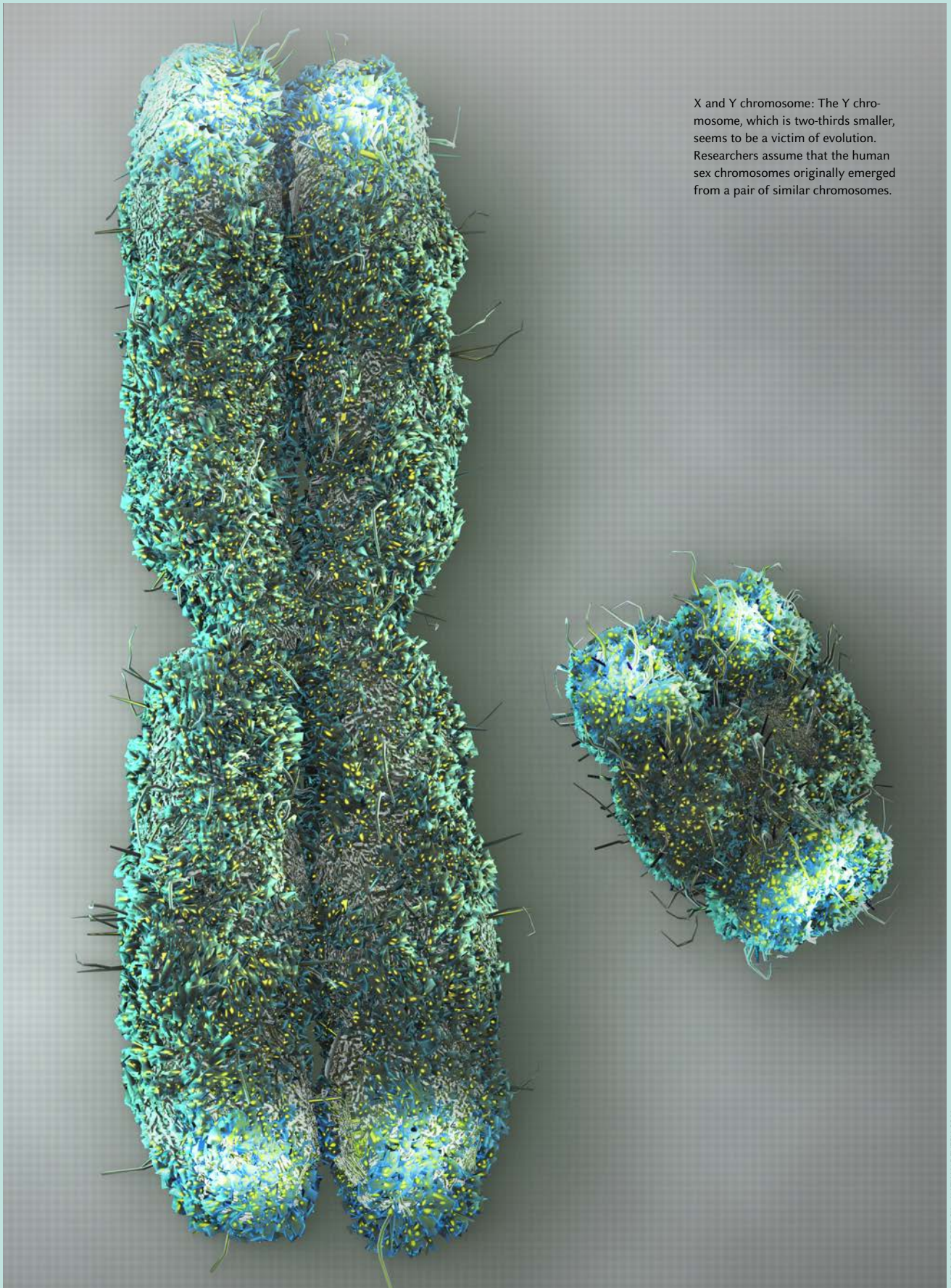
Y chromosomes from 43 men from 21 populations

Dr Peter Ebert, Professor Tobias Marschall and their colleagues have assembled Y chromosomes from

43 men from 21 different human populations. In parallel, the Telomere-to-Telomere (T2T) Consortium headed by Dr Adam Phillippy (Genome Informatics Section, Computational and Statistical Genomics Branch, National Human Genome Research Institute, USA) has published the first complete assembly of the Y chromosome of a single individual of European descent.

Human genomics covers the analysis of all DNA sequences – by contrast with genetics, where research focuses on individual genes. Modern technologies have brought rapid developments in genomics. Nevertheless, the Y chromosome – one of the sex chromosomes – has long been neglected, if not completely ignored. The other sex chromosome, the much larger X chromosome, was already decoded in 2020. So why has there not been a complete reconstruction of the Y chromosome? “As a result of its structure, the Y chromosome – which is two-thirds smaller than the X chromosome – is significantly more difficult to sequence,” says Peter Ebert. The Y chromosome contains large sections





X and Y chromosome: The Y chromosome, which is two-thirds smaller, seems to be a victim of evolution. Researchers assume that the human sex chromosomes originally emerged from a pair of similar chromosomes.



138,000 years of human evolution have shaped the Y chromosome in its current form.

PHOTO: HBU/PAUL SCHWABER/ADOBE FIREFLY

“The project is like a gigantic puzzle with some tricky sections.”

Dr Peter Ebert — bioinformatician

of repetitive, highly condensed sequences not transcribed into messenger RNA. “The project is like a gigantic puzzle with some tricky sections.” To continue the analogy of a puzzle: Which pieces form part of the picture, which are repeated and, if so, how often, where do they belong and what can you actually see on them?

The Y chromosome – a victim of evolution?

In order to sequence a genome, the DNA is broken down into fragments. These fragments are then computationally assembled into a complete genome with more than six billion base pairs, which form the 46 human chromosomes. The method is highly accurate and works well for the majority of the genome.

However, the Y chromosome appears to be a victim of evolution. Researchers assume that the human sex chromosomes originally emerged from a pair of structurally

similar chromosomes but that one of them, the Y chromosome of our ancestors, subsequently experienced significant degeneration. The chromosome has in fact lost 97% of its former genes in the course of many millions of years of reproduction. This idiosyncratic evolutionary development has led to speculation that the human Y chromosome could even eventually disappear completely, although admittedly not for millions of years yet. However, it is already possible to observe that some biological men are losing the Y chromosomes in dividing cells as they age – with as yet unknown health consequences.

The group including Pille Hallast, Peter Ebert and Mark Loftus – the lead authors of the current publication – examined 43 Y chromosomes from 21 populations around the world. This has several key advantages: On the one hand, it enables better depiction of human diversity than e.g. the previously described reference genome of one male individual of European descent. In the current study, almost half of the chromosomes came from African lineages. In addition, the large

“We have combined various technologies to ensure maximum accuracy in resolving the difficult sequence sections, which have not formed part of any reference to date,” explains Dr Peter Ebert in conversation with Susanne Dopheide.



PHOTOS: BERNHARD TIMMERMANN



“Such projects are only conceivable with the help of high-performance computers such as those at the Centre for Information and Media Technology at HHU,” says Dr Peter Ebert.

number has already enabled the discovery of extraordinary individual variability in Y chromosomes. This was not only previously unknown, but could also prove to be an important knowledge base in the context of genetic conditions.

Influence on cancer?

Not least, however, the analysis of 43 different individuals representing various Y lineages has also enabled fundamental insights into the structure of the Y chromosome. It was possible to redefine the boundaries between the different chromosomal regions more precisely and identify variations with an unprecedented level of resolution and clarity.

The relevance of the Y chromosome for male health, among other things, is increasingly coming to the fore:

Its significance with regard to the probability of disease and poorer prognosis in the case of non-gender-specific cancers in men compared with women has only recently become clear. In June 2023, Nature published two studies on the Y chromosome and its influence on cancer in men. What was previously attributed to the less healthy lifestyle of men e.g. with regard to diet, exercise and stress, would also seem to include a genetic component.

“Better knowledge of the Y sex chromosome is also of interest for fertility treatment,” says expert Professor Dr Jan-Steffen Krüssel, head of the “UniKiD” interdisciplinary fertility centre at University Hospital Düsseldorf. “The treatment of poor sperm quality would require gene therapy to correct the mutations in a specific region of the chromosome, but we have a long way to go before we can do that. However, if further regions on the Y chromosome are identified, which are associated with poor sperm quality, that would be

“Better knowledge of the Y sex chromosome is also of interest for fertility treatment.”

Professor Dr Jan-Steffen Krüssel — fertility specialist

“In both diagnostics and treatment stratification, there is an increasing trend towards personalised medicine and we cannot afford to have any blind spots on the genome going forward.”

Professor Tobias Marschall — bioinformatician

helpful when it comes to explaining the reason for poor sperm quality to those affected.” Professor Krüssel reports that it is frequently not possible to identify any concrete causes for poor sperm quality. “That is often not easy to accept, so an explanation would be helpful, even though treatment is not yet possible.”

Disease, poorer prognosis, poor sperm quality: “To investigate these findings in more depth, it is necessary to know the Y chromosome in full,” says Dr Peter Ebert.

New trend: personalised medicine

With a view to the future of biomedical research, it is clear that “in both diagnostics and treatment stratification, there is an increasing trend towards personalised medicine and we cannot afford to have any blind spots on the genome going forward,” says Professor Tobias Marschall. He is Co-Chair of the Human Genome Structural Variation Consortium (HGSVC), which is dedicated to the comprehensive description and analysis of human genetic variation and within the framework of which this project was realised.

PUBLICATION

Hallast, P., Ebert, P., Loftus, M. et al. Assembly of 43 human Y chromosomes reveals extensive complexity and variation.

Nature 621, 355–364 (2023).

→ <https://doi.org/10.1038/s41586-023-06425-6>

MORE INFORMATION

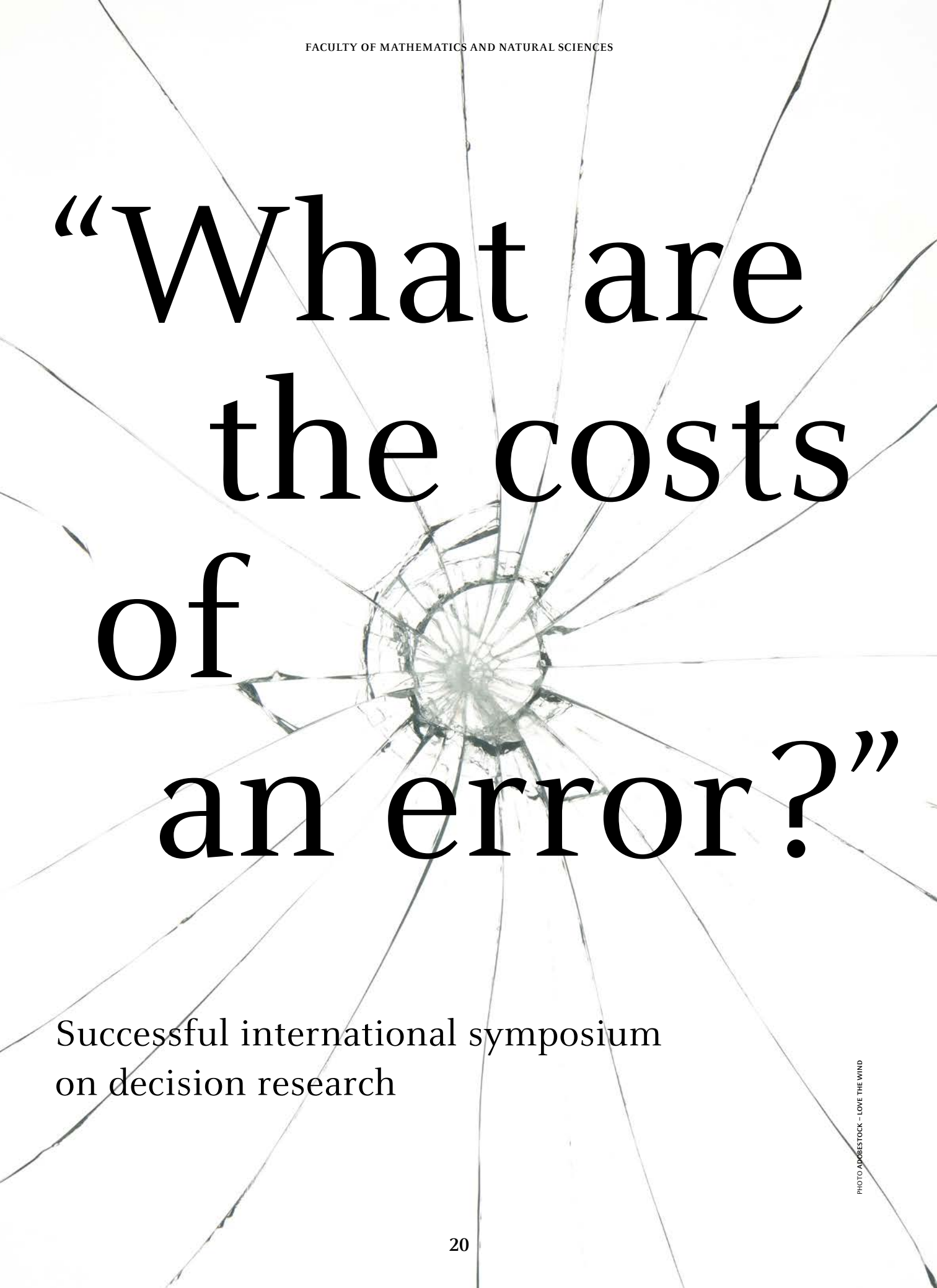
The complete sequence of a human genome (2022)
→ www.science.org/doi/10.1126/science.abj6987

Human Genome Structural Variation Consortium
→ www.hgsvc.org



Dr Peter Ebert, head of the Core Unit Bioinformatics

Dr Peter Ebert joined Professor Marschall’s working group “Algorithms for Computational Genomics” at the Saarland University in 2018. He gained his doctorate at the Max Planck Institute for Informatics in Saarbrücken. In 2020, he joined Professor Tobias Marschall at the Institute of Medical Biometry and Bioinformatics in Düsseldorf. He was honoured with the Ulrich Hadding Research Award in 2021. His key research area is genomics. Ebert is head of the Core Unit Bioinformatics at the Medical Faculty.



“What are
the costs
of
an error?”

Successful international symposium
on decision research

BY ARNE CLAUSSEN

Twelve years ago, the idea arose from a psychology seminar to invite leading researchers from the field of decision science to Düsseldorf every summer to discuss current topics in the field. Professor Dr Tobias Kalenscher from the Comparative Psychology research team at Heinrich Heine University Düsseldorf has been running the “Düsseldorf Symposium on Decision Neuroscience” ever since.

W “We always read current papers in my course on decision neuroscience back then,” remembers Professor Kalenscher, “but students did not have the opportunity to ask the authors direct questions. So, in 2012, we had the idea to invite some of them to Düsseldorf.”

The idea developed into a tradition, which was even continued during the coronavirus pandemic – in part online, in part as a hybrid event. On 26 June 2023, well over 200 people took part in the event.

Looking back, you can see how far research has advanced, says Kalenscher: “For a long time, the established opinion in decision neuroscience was that a person will only help others when it brings the helping individual a strategic advantage.” For example, when profit can be

maximised, food resources exploited or reproduction better secured as a result. “This paradigm no longer applies today, as many of the examples discussed at our Symposium over the years prove. Many colleagues have in fact demonstrated that prosocial behaviour without direct personal gain exists.”

Altruistic rats

Professor Dr Inbal Ben-Ami Bartal from Tel Aviv University documents this, taking rats as an example: “The animals monitor the well-being of their conspecifics.” In extensive behavioural experiments, she and her team examined the processes that motivate rats to help other

Organisers and speakers at the Düsseldorf Symposium on Decision Neuroscience, bottom right: Professor Dr Tobias Kalenscher.



PHOTO MARKUS MALEK



1: The Symposium enables intensive exchange between young academics and researchers, who are performing ground-breaking work in decision neuroscience.

2: A packed event hall at the *Haus der Universität*

3: Professor Dr Inbal Ben-Ami Bartal, Tel Aviv

4: Austrian Federal Minister of Labour and Economy, Professor Dr Martin Kocher, Vienna

5: Professor Dr Carmen Sandi, Lausanne

6: A lively discussion during the event

7: Programme for the 12th Düsseldorf Symposium on Decision Neuroscience





PHOTO HHU/JOCHEN MÜLLER

Professor Tobias Kalenscher headed the 12th Düsseldorf Symposium on Decision Neuroscience, which was held at the *Haus der Universität* on 26 June 2023.

animals – even those unknown to them. The Israeli researchers found regions of the brain that are associated with empathy, as well as different neural regions of the brain that are active during behaviour vis-à-vis known and unknown animals.

Why do people make irrational decisions?

The US American researcher Professor Dr Paul Glimcher from New York University is considered one of the founders of neuroeconomics. His question: Why do people make so many irrational decisions? Among other things, he bases his answer on thermodynamic analyses of how much energy the brain uses on average, namely around 400 kilocalories or 20% of an average person's energy intake – at just 3% of their body weight. Glimcher: "If more energy were available to the brain, enabling it to perform better, it would make fewer mistakes. What is represented in the human brain is a compromise between resource consumption and mistake rate." So, ultimately, the optimisation question that defined evolution is: What are the costs of an error?

Professor Dr Carmen Sandi from the *École Polytechnique Fédérale de Lausanne* is working on translational aspects of the role of stress in neuropsychiatric conditions such as depression, generalised anxiety disorder or post-traumatic stress disorder. In basic and applied research, she is examining why some people are very susceptible

to stress, while others cope well even with extreme or chronic stress. In the process, she is concentrating primarily on the role of the reward systems in the brain in resilience to stress and of the mitochondria – the energy suppliers in the nerve cells of the brain.

"The neuroscientific aspects of decision-making can now be analysed in ever greater detail and the processes taking place in the brain better understood," summarises Professor Kalenscher: "The event format we have developed in Düsseldorf is very well received by students. This is also evident in the discussions, which are primarily driven by the young academics, who contribute their own ideas."

"The event format we have developed in Düsseldorf is very well received by students."

Professor Tobias Kalenscher — psychologist

Behavioural Economics and Politics

Is altruism irrational?

Professor Dr Martin Kocher, economist and Austrian Federal Minister of Labour and Economy, was a guest at the 12th Düsseldorf Symposium on Decision Neuroscience. At the event, Dr Arne Claussen spoke to him about the links between science and politics, and whether experiments are also possible in politics.

MAGAZINE Minister, on the one hand, you conduct behavioural economics research at the University of Vienna and you assumed responsibility for the Labour portfolio in 2021 and the Economy portfolio in 2022. What has changed for you since you entered politics and how do you perceive the two worlds today?

Professor Kocher I was already relatively close to the world of politics during my time in academia: As an advisory research institute, we received many requests from public offices. However, you do of course gain a greater understanding of both worlds – the scientific and the political – when you enter active politics. The different underlying objectives and restrictions become clearer. This is very helpful when it comes to assessing where communication difficulties arise between the two worlds.

MAGAZINE Could you provide a concrete example?

Professor Kocher There are very different timeframes involved: For policy-makers, issues can arise very suddenly and the legislative periods dictate the pace; this is almost completely alien to science. And of course, there is also the language used when talking to the media: Policy-makers learn to speak in headlines, while scientists provide comprehensive explanations.

MAGAZINE Your field of expertise is “behavioural economics”.

Professor Kocher It is all about how people make decisions against an economic background. The spectrum is broad: from decisions about savings to the question of whether and when people cooperate with and trust each other. The important aspect is that not everyone acts rationally and in

their own interests – some also demonstrate altruism and prosocial behaviour. And there is also irrationality, which we refer to as “bounded rationality”: describable systematic variances from conventional rational assumptions. Behavioural economics seeks to analyse this spectrum theoretically and then to substantiate it empirically – above all by means of laboratory and field experiments.

MAGAZINE Is altruism irrational?

Professor Kocher These are different aspects. I distinguish between rationality or bounded rationality on the one hand and social preferences, like altruism and egoism, on the other hand. So, a person can be entirely rational, yet still be sympathetic to other people and thus e.g. rationally donate large sums of money to charity, or stand up for a strong social system. These



PHOTOS: BMWAU/HOLEY

Professor Martin Kocher, Austrian Federal Minister of Labour and Economy, gave a presentation at the 12th Düsseldorf Symposium on Decision Neuroscience.

two different components should not be mixed.

MAGAZINE What do experiments in an economic context look like?

Professor Kocher We usually start in the laboratory and then often go out into the field. Typical decision-making experiments like those conducted by psychologists emulate decision-making situations under well-controlled conditions. Participants are randomly assigned to either a treatment condition where they receive, for example, a certain amount of social or monetary support or information or to a control

condition where they do not receive this. So, when we compare the decision-making behaviour of the two groups, we see the effect of this treatment condition.

MAGAZINE The Düsseldorf Symposium on Decision Neuroscience looked at the neuroscientific aspects of decision-making. How do neuroscience and economics interact?

Professor Kocher There is a field called “neuroeconomics”. It investigates fundamental economic preferences and associated neural correlates, for example social, risk or time preferences. The latter relates

to so-called time discounting: the conflict between short-sighted and far-sighted decisions, or what happens in the brain when trading-off the costs and benefits of a future decision? Behavioural economics and neuroscience are engaged in an intensive dialogue on this. A lot has changed thanks to the development of neuroimaging techniques. We have conducted research into the effect of hormones on economic decisions, which is also part of neuroeconomics.

MAGAZINE Among other things, neuroscientific research examines how decisions are taken under stress. How do you put people under stress in economic experiments?

Professor Kocher Stress can be induced, as can joy and sorrow. Stress can be generated e.g. by introducing time pressure: A complex decision needs to be taken in a short – often too short – period of time, otherwise there will be no reward. Economists use established methods from the field of psychology, draw inspiration from the boundaries of the discipline and also largely use similar terminology.

“Policy-makers learn to speak in headlines, while scientists provide comprehensive explanations.”

Professor Martin Kocher — Austrian Federal Minister of Labour and Economy

MAGAZINE How do you see the decision-making sciences in the political context?

Professor Kocher Ultimately, the key aspect in politics is often why people decide in favour of one thing or another and how these decisions are (or can be) influenced: Why does someone accept a job, what are the benefits behind it? For policy-making, this means: Which factors do we need to consider in order to respond to economic developments and how do people react to changes? A concrete example: Short-time work during the pandemic. In Austria, Germany and many other countries, extensive programmes involving huge sums of money have been implemented in recent years. We wanted to know: How do you design a system to ensure it provides the right incentives for companies and for employees. Short-time work should be used when it is needed, but not when it is not needed.

MAGAZINE During the coronavirus pandemic, science found itself acting as a political advisor in an unprecedented and unpractised way. How has this changed the relationship between science and politics in your experience?

“The demand for scientific expertise has never been greater than during the pandemic, both with regard to the medical aspects and the social/societal effects.”

Professor Martin Kocher — Austrian Federal Minister of Labour and Economy

Professor Kocher The demand for scientific expertise has never been greater than during the pandemic, both with regard to the medical aspects and the social/societal effects. Scientists suddenly found themselves in the public spotlight and expectations were high. That was not easy, but I think many scientists learned from the experience. In the same way, policy-makers now also have a much better understanding of the role of science and how to embed it in decision-making processes.

MAGAZINE How do you conduct experiments in policy-making?

Professor Kocher When policy-makers want to see whether an approach works, it is helpful to test it via an experiment. However, it is usually called a “pilot project”, as the term “experiment” is not particularly popular with the public. So, you start in one Federal State, evaluate the results and then implement it as a national law if it is successful. Experiments are a good thing as you can learn from them. You can evaluate the impact of an alternative course of action. Consequently, I always advocate a certain amount of experimentation in order to try out different possibilities. For me, it is a prerequisite for good policy-making to be flexible and respond to new insights – something that is completely normal for science. I find policy-makers who are overly confident that they know everything rather dangerous. In the long term, it is good to admit that even policy-makers do not know everything *ex ante*, but that it is good to try things out and then agree what works – and not to do what works less well.



Professor Kocher: “During the pandemic, scientists suddenly found themselves in the public spotlight and expectations were high.”

“Punishment is silver, asset seizure is golden!”

Combating money laundering in Germany

BY CAROLIN GRAPE

Wirecard, Panama papers, mafia and clan criminality: According to estimates, one hundred billion euros are laundered in Germany every year – and the real figure is likely to be significantly higher. “Yet, this has barely registered in the public perception,” says Professor Dr Till Zimmermann. The work of the holder of the Chair of Criminal and Criminal Procedure Law focuses in particular on the injustice of corruption in all areas of society. He was recently involved in the formulation of a draft law on combating money laundering.

In international comparisons, Germany continues to lag behind when it comes to combating money laundering. The Financial Action Task Force (FATF) rated Germany as “poor” in its 2022 country report. The FATF – the most important international body of the OECD and G7 countries – regularly reviews whether its member states are doing enough to combat terrorism financing and money laundering.

Germany is an ideal location for hiding the origins of illegal assets via bogus companies, cash payments or the purchase and subsequent sale of luxury goods: “In this country, it is still far too easy to transfer and manage assets without having to reveal your true identity or fear

detection. Criminals also profit from this, as it enables them to retain the income from their crimes or invest in new ones.”

The reasons for this are clear: Germany is one of the largest economies in the EU and therefore attractive for investments and business transactions. Its well-developed financial sector and many financial institutions make it more difficult to monitor (complex, international) money transfers and financial operations. As one of the largest export nations, Germany maintains close economic links with countries all over the world – which facilitates the cross-border smuggling of cash or money laundering activities. The federal system in Germany also makes central



PHOTO FABIAN HOFFMANN

Professor Till Zimmermann believes Germany is on the right track when it comes to combating money laundering, but is not yet properly equipped to act against all the dangers.

case and data recording more difficult. “Added to this is the intensive use of cash: You can pay cash for everything in Germany, regardless of how expensive it is. You are only obliged to provide ID for amounts above 10,000 euros. The risk of detection is low,” says the legal expert.

In order to close the criticised loopholes, the government has implemented several changes: A special authority – the Financial Intelligence Unit (FIU) – has been established to pursue money laundering. However, years after its establishment and several internal reforms, the Unit is still struggling with major organisational difficulties. It now reports to the Customs Criminal Office (*Zollkriminalamt* – ZKA) and thus ultimately to the Federal Minister of Finance.

How can you catch money launderers?

A stricter Money Laundering Act was implemented in 2021: So-called enablers (banks and insurance companies, but also notaries, estate agents, casinos and goods traders/dealers such as pawnshops) are obligated to report unusual or suspicious transactions to the FIU. If they do not meet this obligation, or only do so in part, they risk high fines and penalties.

The Federal Ministry of Finance has also produced a “National Risk Analysis” on combating money laundering, in which it has also defined the areas on which the authorities should concentrate. Cross-portfolio and international bodies are aimed at coordinating the work better than in the past.

However, investigations into cases of money laundering remain difficult. Anyone who launders money from criminal activities faces up to ten years in prison. That sounds drastic but, according to the legal expert, it is an empty threat in practice: “Suspicious alone are not sufficient to open a money laundering investigation – concrete facts have to be available. And in any case, in Germany, a person can only be punished when it can be proven in a criminal trial that the laundered money comes from a crime. Laundered drug money no longer has to come from drug dealing as was the case before the reform – a minor offence is now sufficient – but the hurdle remains.”

In addition to punishment, the seizure of criminal assets is an important part of combating money laundering – as “organised crime is only worthwhile when criminals can keep their profits and invest in expensive goods.” As the expert puts it in a nutshell: “Punishment is silver, asset seizure is golden!”

In 2017, legislators amended the law on asset seizure and introduced the new instrument of “non-conviction-based confiscation” (NCBC). Zimmermann explains: “If we find assets or items of unclear origin in the possession of

someone we suspect of a criminal offence, the state can now seize them more easily – even without prior conviction for a criminal offence. The only important thing for the seizure is that the public prosecutor’s office can convince the court that the assets come from a crime,” says the criminal law expert. “The accused also loses the assets or items seized during investigations if they cannot prove that they obtained them legally.”

The expert believes the NCBC still does not go far enough: “To date, it has only been possible to use this instrument against careless individuals who are already being investigated for a crime anyway. Proving professional money laundering structures is rarely ever successful,” says Till Zimmermann.

He therefore advocates freeing asset seizure from the shackles of criminal trials and regulating it in a separate law – with a focus on preventive financial investigations, i.e. the proactive analysis of the source and target of suspicious financial transactions. Responsibility for taking a decision on asset seizure would then lie – by contrast with the situation today – with the civil courts. “You would no longer need an initial suspicion under criminal law. We could then – as in Italy and the USA – completely reverse the burden of proof and suspects would have to prove from the outset that their assets do not come from crimes and have not been laundered.”

Conclusion: Germany is on the right track when it comes to combating money laundering, but is not yet properly equipped to act against the dangers it harbours. A genuine reversal of the burden of proof, a fixed cash limit, more trained personnel in the specialist authorities, better statistical recording, targeted analysis of money flows and greater cooperation at EU and international level are required to drive the money launderers out of their paradise.

“In this country, it is still far too easy to transfer and manage assets without revealing your true identity or having to fear detection.”

Professor Till Zimmermann — legal expert



Haus der Universität

The *Haus der Universität* is a place of dialogue and exchange between science and society – in the heart of Düsseldorf. After extensive renovations, the van Meeteren Foundation kindly allowed Heinrich Heine University to use the building at Schadowplatz 14 as an event centre and, since 2013, as a venue for scientific conferences and for presenting university research and teaching

as well as academic culture. The *Haus der Universität* takes on a central function for Heinrich Heine University at the interface between science and public. It is part of the higher-level public engagement strategy being pursued by the university, which actively furthers the exchange between the city of Düsseldorf, its citizens as well as society as a whole.

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