2023 — ISSUE 1

MAGAZINE

of Heinrich Heine University Düsseldorf

Is it fair?

Triage in a pandemic

ARTS AND HUMANITIES
A unique gaze

BIOLOGY
A microbe never walks alone

MEDICINE
A cure for HIV

hhu.

1 — 2023

Faculties

Title

PHOTO CHRISTOPH KAWAN

PHOTO CITLALI GUITERREZ

PHOTO PAUL SCHWADERER

What do scientists at HHU think of the triage regulation added to the Infection Protection Act?

PHOTO ALICE HAUSDORFF

German-Jewish women photographers in Palestine/Israel were commissioned to promote the newly established Jewish State of Israel ...but also forgotten by history.

Faculties

Legal notice

PUBLISHER
Communications Office of HHU Düsseldorf in cooperation with the Office of the Vice President for International Relations and the International Office, Universitätsstraße 1, 40225 Düsseldorf

EDITORIAL TEAM
Dr Arne Claussen, Susanne Dopheide, Carolin Grape, Achim Zolke

EDITOR-IN-CHIEF
Dr Victoria Meinschäfer

PHOTOGRAPHY
istockphoto.com – Nerthuz (Cover), Citlali Guiterrez, Christoph Kawan, Steffen Köhler, Paul Schwaderer

LAYOUT AND TYPESETTING
vista – Digital Brand Content Design
studiovista.de

TRANSLATION
Catherine Illsley

CONTACT
"Magazine of Heinrich Heine University Düsseldorf",
Heinrich Heine University Düsseldorf,
Universitätsstraße 1, 40225 Düsseldorf

prorektor.international-wisskomm@hhu.de

Editorial

PHOTO IVO MAYR

Dear Reader,
The pandemic now seems like a ghost of times past and everyone is happy that a return to the old "normal" – a time without restrictions – appears to be possible. However, even though it is no longer as "virulent" as it used to be, the coronavirus has not gone away and we cannot rule out another exceptional pandemic situation in the future. So it is all the more important to take the time now to learn lessons from the experiences gained over the past three years. We need to ask and answer questions that could become critical again in a future crisis.

One such question is how to decide, in the case of scarce resources, which people can be given what medical treatment, i.e. how to prioritise when the demand for treatment is higher than its supply. We are talking about what is known as "triage" and legislation on this has already been passed for the coronavirus pandemic. However, the debate about triage needs to be continued and, within this debate, it is important to consider different perspectives. Being able to find these various approaches within one university and involve them in such a debate offers an immense advantage – and this is exactly what happens in the title story of this HHU Magazine: We look at the topic of "triage" from the perspective of law, philosophy and, of course, medicine. It is clear to see that the three disciplines approach the issue in very different ways. At the same time, it becomes obvious that linking – not merging – these diverse perspectives is essential in order to do the topic justice.

Other research reports in the HHU Magazine are more strongly focused on the individual faculties. We look at German-Jewish women photographers in Palestine, how social media influences the pricing of contemporary art and how to handle the issue of liability claims involving "e-scooters". We also present a microbiology project conducted here in Düsseldorf, funded by the German Research Foundation, which is examining cooperation between microorganisms. A further article looks at the now-famous "Düsseldorf Patient": Medical experts at University Hospital Düsseldorf have succeeded in curing a person of HIV by means of a stem cell transplantation. This great success gives hope to many sufferers, while at the same time demonstrating the importance of research and innovation at universities.

I wish you an enjoyable read! Kind regards,

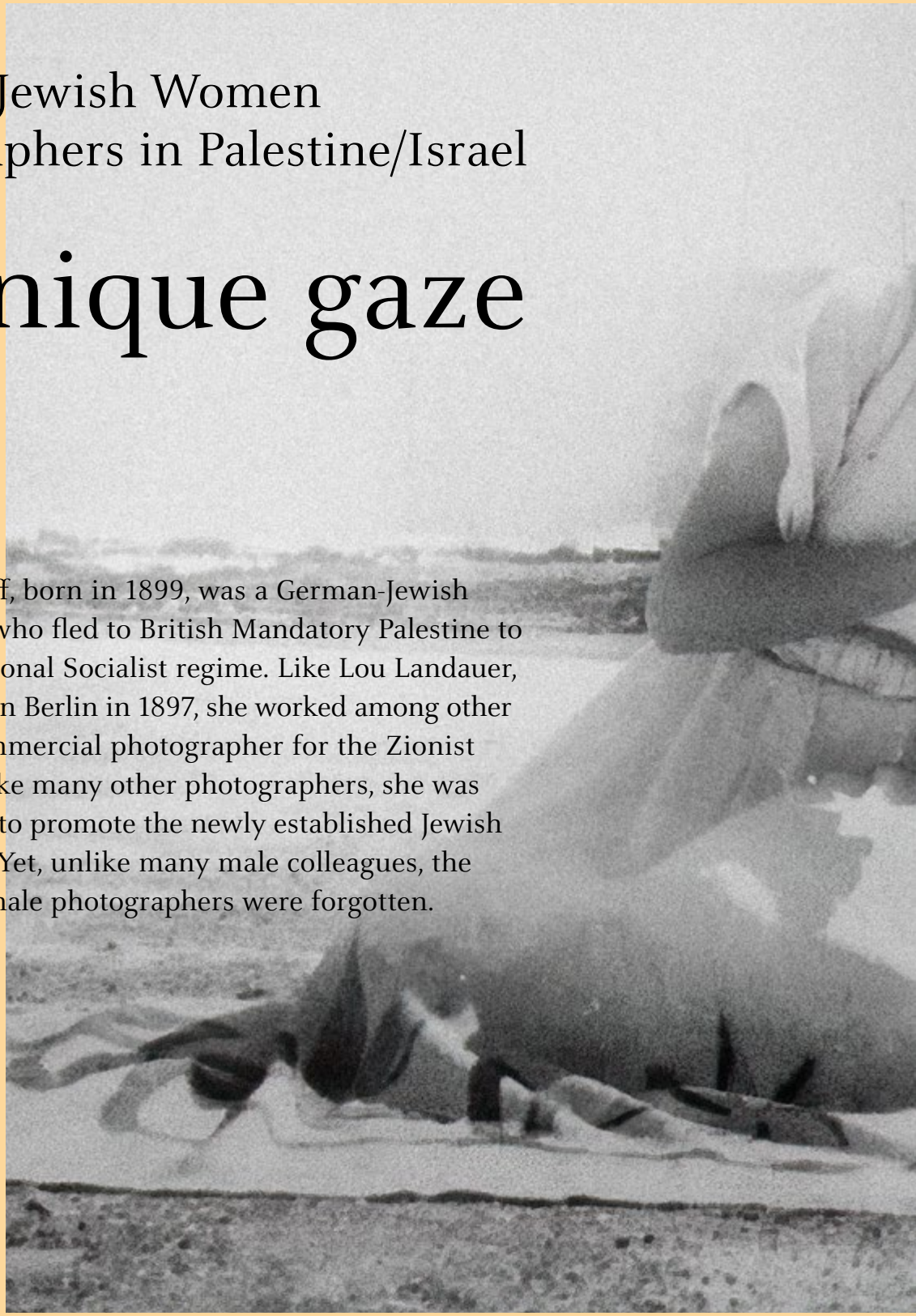
Professor Dr Stefan Marschall
Vice President for International Relations and Science Communication

German-Jewish Women Photographers in Palestine/Israel

A unique gaze

BY VICTORIA MEINSCHÄFER

Alice Hausdorff, born in 1899, was a German-Jewish photographer who fled to British Mandatory Palestine to escape the National Socialist regime. Like Lou Landauer, who was born in Berlin in 1897, she worked among other things as a commercial photographer for the Zionist project. And, like many other photographers, she was commissioned to promote the newly established Jewish state of Israel. Yet, unlike many male colleagues, the majority of female photographers were forgotten.



Alice Hausdorff, Untitled, dancer at the Habima theatre, Tel Aviv, ca. 1945, private collection of Bouky Boaz, Caesarea, Israel

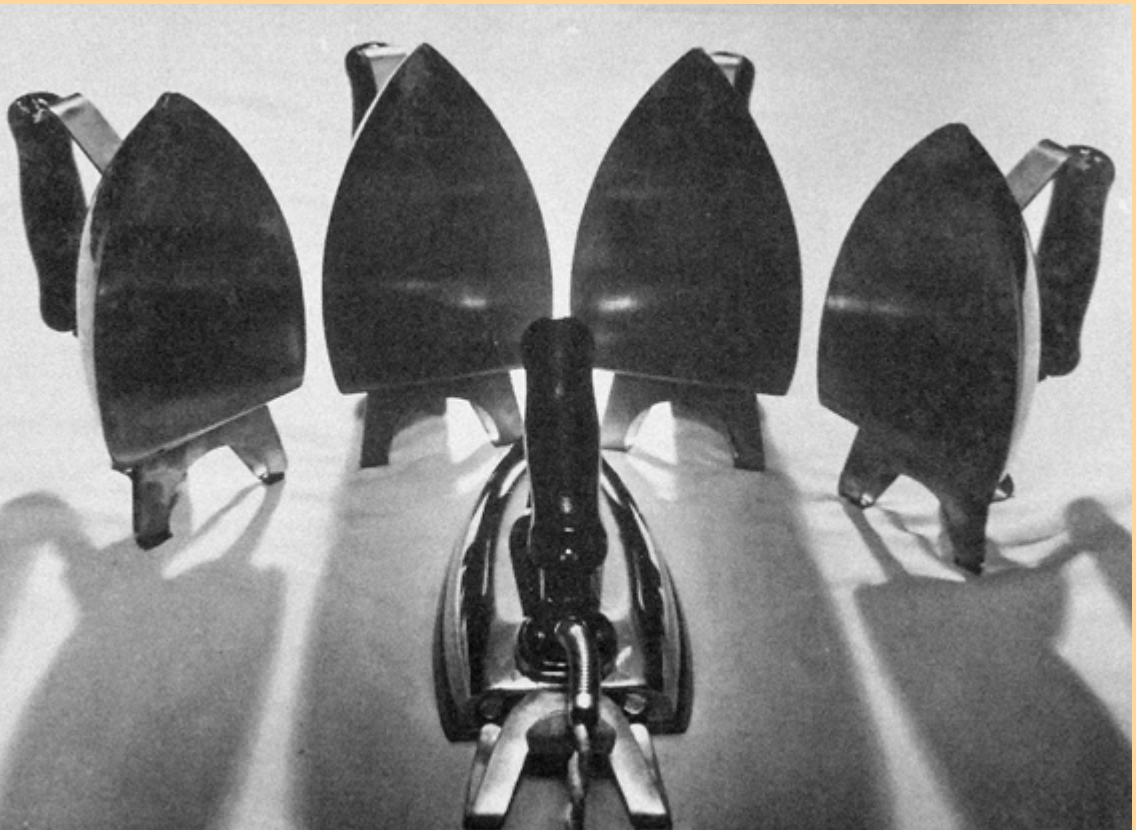
“During the Weimar Republic, photography was explicitly a women’s profession. Women forced their way into previously unoccupied sectors and became portrait or commercial photographers.”

Anna Sophia Messner — art historian

Anna Sophia Messner, research associate at the professorship for Transcultural Studies (Professor Dr Eva-Maria Troelenberg), has rediscovered ten of these German-Jewish women photographers. In her dissertation “Gazing at Palestine/Israel” which has just been published, she documents the life stories and above all artistic work of these women. “During the Weimar Republic, photography was explicitly a women’s profession,” she explains. “Women forced their way into previously unoccupied sectors and became portrait or commercial photographers.” Commercial photography for e.g. the consumer goods industry cast a spotlight on female target groups. Silk stockings or cosmetics were products for women and were often also styled and shot by women. With the emergence of mobile 35 mm format cameras in the 1920s, travel photography also became much easier and in many cases, women were the ones who travelled to foreign countries and shared what they saw there. Naturally always through the eyes of the visual language of the Weimar Republic, with its unique aesthetics of the “New Vision” and “New Objectivity”: clear, sharp and with unusual crops. “A significant proportion of these photographers had Jewish origins. Among other things, this can be attributed to the fact that Jewish middle-class parents were extremely open-minded with regard to the educational and professional ambitions of their daughters,” says Messner.

Unique image style

Women consequently had a significant influence on the visual language of the Weimar Republic and this avant-garde style of photography also quickly aroused interest in the nascent state of Israel. “The former Mandate



Alice Hausdorff, Untitled, advertisement for irons, Berlin, ca. 1930, private collection of Bouky Boaz, Caesarea, Israel

Alice Hausdorff, Untitled, young Arab man collecting water, Israel, ca. 1950, private collection of Bouky Boaz, Caesarea, Israel

naturally also had its own style of photography," says Messner. "The first photographers came to Palestine with their cameras as early as 1839, yet the majority of images taken then were completely different," namely a form of bible photography showing (or replicating) scenes and locations from the bible. Interest focused not on a contemporary view, but rather on a quasi-biblical view of the Holy Land. "This was not the kind of photography that the founders of the young state of Israel had in mind for their process of nation building," says the art historian. Rather, the Zionists were seeking cultural transfer and a modern, western image style. "So they called upon the women photographers of the Weimar Republic to project the image of a modern state out into the world – although these early photographers rarely got any thanks for doing so.

Plucking women photographers from oblivion

Anna Sophia Messner found ten collections of works by important German-Jewish women photographers – in some cases after they had literally been thrown out. The entire estate of Alice Hausdorff was found in an old suitcase on a street in Haifa 18 years ago," comments Messner. "After her death, the landlord cleared the flat inhabited by the single woman and simply threw her photos out." Fortunately, a passing photographer found the images and sold them to an Israeli collector, who granted Messner access to the collection. Hausdorff immigrated to Palestine in 1939. "She first lived in Tel Aviv and then in Haifa after having to give up her own large studio in Berlin," continues Messner. She earned her living by documenting agricultural work and life on the kibbutzim on behalf of the young state of Israel, yet artistically, her heart clearly lay in her theatre photography. She shot for the Habima theatre, the national theatre of Israel, in Tel Aviv yet, despite her many assignments, her name has been completely forgotten in Germany and even in Israel today. "She is never mentioned and is unknown both in collective memory and among academics," says Messner, who is now hoping to change this.

Throughout her study of the photography of the Weimar Republic and in the young state of Israel, the art historian has observed a clear gender gap: "Although

"After her death, the landlord cleared the flat inhabited by the single woman and simply threw her photos out."

Anna Sophia Messner — art historian

“Although women were explicitly commissioned as photographers, their images have seldom been archived – by contrast with those taken by their male counterparts.”

Anna Sophia Messner — art historian

women were explicitly commissioned as photographers and their work and unique image style were genuinely appreciated, images taken by female photographers have seldom been archived – by contrast with those taken by their male counterparts. The majority of the collections have been found by coincidence.”

Oriented to the *Bauhaus* style

The same applies for the images taken by Lou Landauer. Messner discovered her estate in a Berlin auction house and had the opportunity to view it. From the end of the 1920s, Zionist institutions frequently commissioned the photojournalist, who then immigrated to Palestine when the National Socialists seized power. In 1942, Landauer established the first Department of Photography at the Israeli Bezalel Academy of Arts and Design. “She was clearly oriented to the *Bauhaus* style and understood photography as an artistic medium at a very early stage,” says Messner. Yet, despite this important position at the Academy of Arts, Landauer lived in precarious financial circumstances for the majority of the time and immigrated to the USA in 1949. Her images were found at the Bezalel Academy just over six years ago by a cleaner at work. Others arrived at the Berlin auction house via circuitous routes.

Showing the diversity of female perspectives

“The images of the ten women photographers studied construct an aesthetic, iconographic, social and historic matrix, and illustrate the diversity of female perspectives on the Weimar Republic, Palestine and the young state of Israel,” comments Messner, who views the photographs as “transcultural contact zones”. “The images demonstrate a variety of alternative perspectives on Palestine, Israel and the nation-building process with a view to the prescribed Zionist narrative, which defined the image culture and was dominated by male image hierarchies.”

→ **Anna-Sophia Messner: *Palästina/Israel im Blick. Bildgeographien deutsch-jüdischer Fotografinnen nach 1933***
(Palestine/Israel in View. Pictorial Geographies of German-Jewish Women Photographers after 1933), Wallstein Verlag, 44 euros

Alice Hausdorff, Andrejew Jertschuk – Der Irrentanz (The Dance of the Lunatic), Berlin, ca. 1930, private collection of Bouky Boaz, Caesarea, Israel

Update for liability law?

When no-one pays compensation for a fall over an e-scooter

PHOTO ISTOCKPHOTO.COM – JUN

BY CAROLIN GRAPE

Really useful for some, yet a constant source of annoyance for others: the e-scooters permitted on inner-city roads since 2019. The ideal companion for the "first or last mile", they bring passengers from buses or trains directly to the office or their own front door. Primarily available from various providers as rental vehicles, they can now be found in large numbers in many city centres.

To date, however, e-scooters have been less known for their eco-friendly credentials and more for high accident figures resulting from users illegally riding them along pavements or leaving them in unsafe locations where pedestrians could fall over them. Who is liable in the event of an accident involving an e-scooter? Professor Dr Dirk Looschelders, holder of the Chair of Private Law, Private International Law, Comparative Law and Private Insurance Law at the University of Düsseldorf, was involved in the formulation of recommendations at the 60th road traffic law conference *(Verkehrsgerichtstag)* in Goslar.

Applicable law

By contrast with e-bikes, e-scooters are powered solely by an electric motor. Consequently, they are defined as Personal Light Electric Vehicles (PLEVs) in the Ordinance on the participation of Personal Light Electric Vehicles in road traffic and amending other road traffic regulations *(Elektrokleinstfahrzeuge-Verordnung)* and thus have to be insured. However, unlike e.g. cars, they are only subject to fault-based liability and not strict liability of the owner – which represents a major problem when it comes to the settlement of accident claims. Dirk Looschelders explains the difference: "Under certain circumstances, a person who owns a car may be liable for damages in the event of an accident, irrespective of whether they are actually at fault. Strict liability also covers cases where e.g. a car is parked correctly but the handbrake fails and the car rolls into another vehicle."

However, this does not generally apply to slow-moving vehicles designed to have a maximum speed of 20 km/h. To date, this classification has applied to vehicles such as agricultural and forestry tractors, construction vehicles and other self-propelled machinery, motorised invalid vehicles and also e-scooters. Legislators have explicitly excluded these vehicles from strict liability in Art. 8 (1) of the Road Traffic Act *(Strassenverkehrsgesetz – StVG)*

> "Under certain circumstances, a person who owns a car may be liable for damages in the event of an accident, irrespective of whether they are actually at fault."
>
> **Professor Dirk Looschelders — legal expert**

Accidents involving Personal Light Electric Vehicles (PLEVs): e-scooters

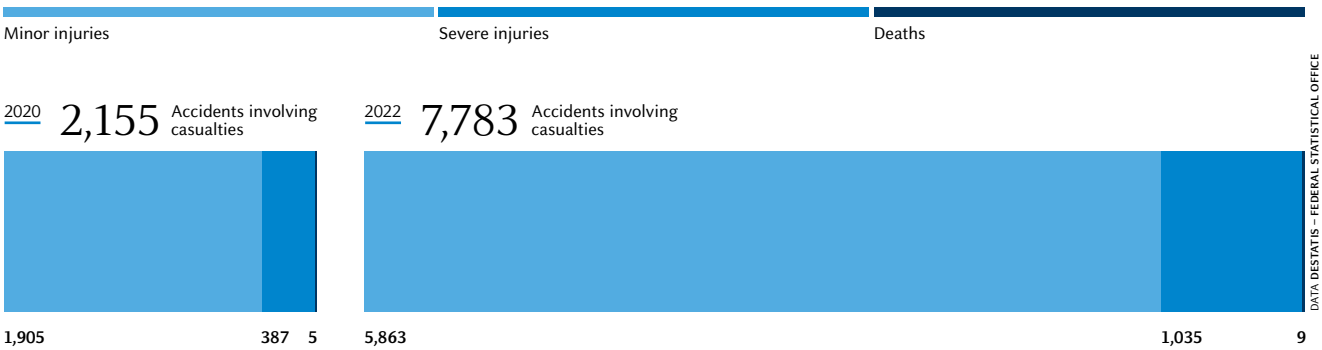


PHOTO ISTOCKPHOTO.COM – MARTIN WAHLBORG

Doubly dangerous for pedestrians: Without proof of who actually knocked the e-scooter over, no liability can be assigned.

due to their low risk potential. Consequently, only fault-based liability applies in the event of accidents, i.e. compensation will only be paid out where concrete proof can be provided that a person is at fault.

"This is problematic when parked e-scooters fall over and damage cars or become hazards on pavements. If it cannot be established who actually knocked the e-scooter over, no liability can be assigned as the vehicle owners (usually the rental companies) do not have to pay compensation for damage incurred in this way. Without strict liability, the claimant will not receive any compensation," says the expert. "As the situation on the roads has changed, the general statutory exclusion of strict liability for slow-moving vehicles is no longer appropriate," he continues.

More dangerous than originally thought

He is calling for a fundamental reform of Art. 8 (1) StVG for several reasons: Over the course of time, the potential risks presented by slow-moving vehicles have increased significantly – whether as a result of changes to technical dimensions and features, higher speeds of other road users, or new types of vehicles such as e-scooters, the increase in usage and limited space on the roads.

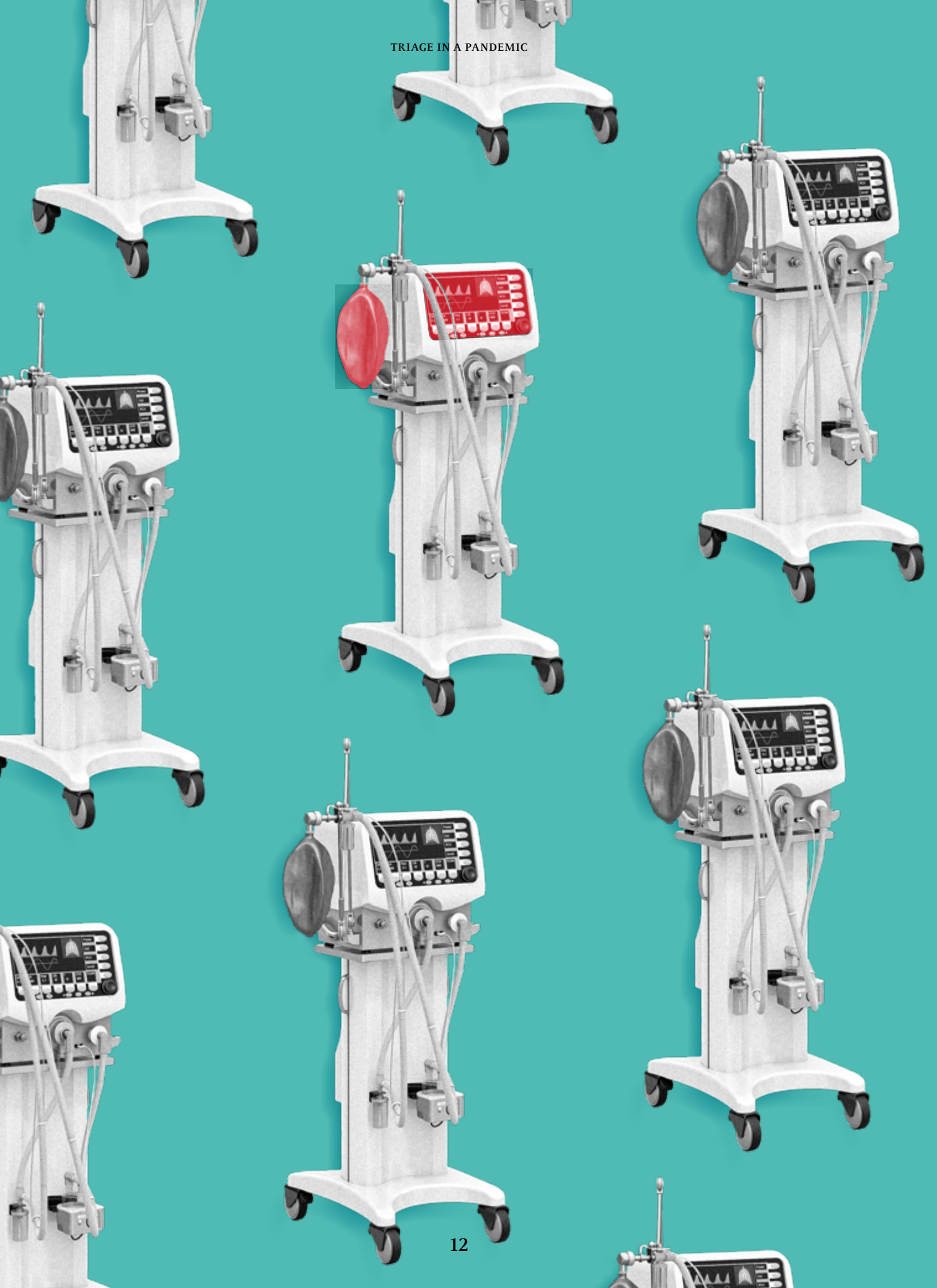
The fact that the inappropriate use of PLEVs (travelling on pavements, etc.) is much more dangerous than originally thought is reflected in accident statistics. The Federal Statistical Office began recording e-scooter accidents involving casualties, minor injuries and deaths in 2020. By October 2022, the number of accidents involving casualties had more than trebled, while deaths almost doubled from five to nine, despite the fact that traffic volumes were lower than usual during this period as a result of the pandemic. And: These figures do not include the many cases that were not (or could not be) reported.

"Now it is down to the government. Liability law urgently needs updating to take account of the situation on modern roads. Legislators must treat e-scooters in exactly the same way as vehicles and apply strict liability, even if this is likely to result in higher insurance premiums for rental companies and higher rental prices for users as a consequence," summarises Dirk Looschelders.

Agreeing with Professor Looschelders, participants in the 60th road traffic law conference voted in favour of a fundamental reform of the exemption and recommended the general abolition of the concession for slow-moving vehicles (6 – 20 km/h). The road traffic law conference in Goslar is an influential institution whose recommendations to legislators have already frequently shaped road traffic regulations.

"This is problematic when parked e-scooters fall over and damage cars or become hazards on pavements."

Professor Dirk Looschelders — legal expert



Triage in a pandemic

Is it fair?

BY VICTORIA MEINSCHÄFER

Two people contract an infection. Their condition worsens and they need to be put on a ventilator, but only one bed is available in intensive care and all nearby hospitals are full. Who must be helped, who may be helped? Statutory regulations for this triage situation were added to the Infection Protection Act (*Infektionsschutzgesetz*) in November 2022. But what do professors at HHU think of this? Professor Dr Helmut Frister (criminal law), Professor Dr Frank Dietrich (philosophy) and Professor Dr Joachim Windolf (surgery) explain their point of view.

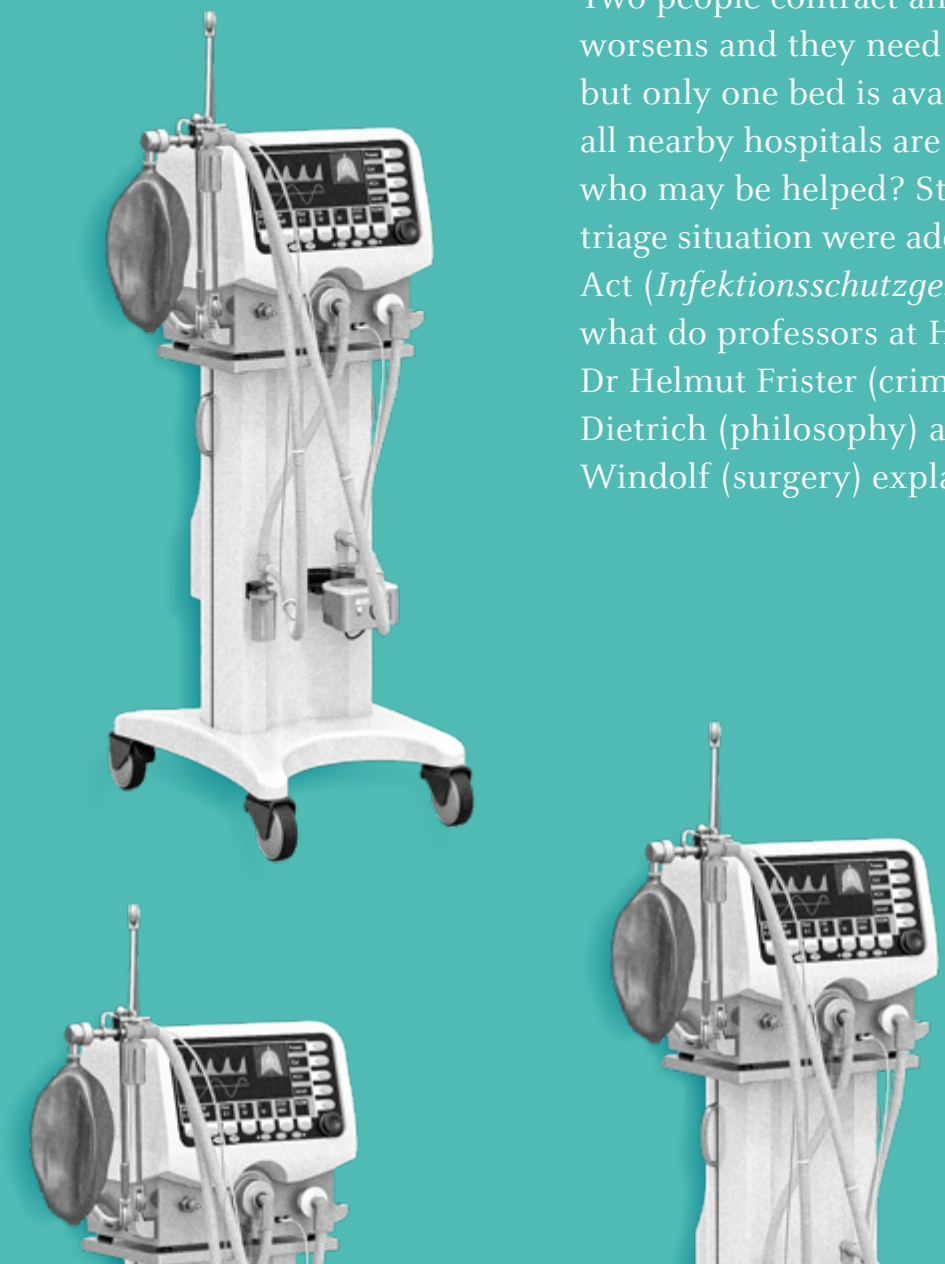


PHOTO ALEXLMX

The addition of these regulations to the Act was necessitated by a claim brought before the Federal Constitutional Court in the summer of 2020 by organisations representing people with disabilities. They feared that people with disabilities would be at a disadvantage compared with other groups of people in the event of a triage situation during a pandemic, as doctors may consider their probability of survival to be lower than that of healthy individuals as a result of their disabilities. Professor Frister does not fully understand why this ruling by the Federal Constitutional Court was necessary: "Discrimination is already prohibited under Art. 3 of the Basic Law for the Federal Republic of Germany *(Grundgesetz)*. Discrimination is also prohibited under the UN

Defining a statutory regulation

Convention on the Rights of Persons with Disabilities so there was not really any reason to pass yet another law." Nevertheless, legislators needed to find a solution following the ruling in Karlsruhe as the court decided in favour of passing a statutory regulation on how to deal with such shortages in the event of a crisis. As explicit reference was made to the case of the pandemic, this regulation was added to the Infection Protection Act. "The Federal Constitutional Court called upon legislators to define what to do in the event of a pandemic, so that is what they did," says Frister.

Professor Helmut Frister

PHOTO PAUL SCHWADERER

Very rare

Yet, like the philosopher Frank Dietrich, he assumes that the regulation which has now been passed would also be applied in other triage situations in the event of a crisis. "I think it is unfortunate that it only relates to the pandemic situation," says Professor Dietrich, "and wonder whether it would actually be more appropriate to include the regulation in the Criminal Code *(Strafgesetz)* rather than the Infection Protection Act." Professor Windolf fully understands the concerns of the organisations representing people with disabilities, but feels them to be premature. "Just because a person is unable to walk and uses a wheelchair, no-one would ever think of treating them worse in the context of Covid. In the case of Covid, we always decide solely on the basis of whether the patient has a better or worse chance with regard to their breathing situation. It has absolutely nothing to do with any disability."

In any case, it is important to state that triage would only be applied if a transfer to another clinic were no longer possible – and it is highly unlikely that this case would occur outside the framework of pandemics. After all, even major natural disasters or accidents are mostly limited to a local region. During his time as head of trauma surgery, Professor Joachim Windolf was in fact confronted with triage decisions following major accidents/incidents. "It is extremely hard for the person who has to make a decision! After all, they have to decide quickly who should be treated immediately, who can wait a few minutes and who has no chance anyway." However – as the medical professional clearly states – "this is a special case – it has nothing to do with individuals, it is about ensuring collective survival." Furthermore, as he sees it, it is a situation which the majority of doctors rarely experience during their careers "and, if so, then only with a few patients to consider."

Windolf is pleased that there is now – at least for the case of a pandemic – a law that sets out clear regulations. He believes that, to date, many colleagues feel they have been left to their own devices by politicians and society when it comes to having to make a decision about how to allocate scarce resources. "How should we, as doctors, make such a decision?" he asks. "Even if I can still transfer a patient somewhere else, how should I decide

who to transfer?" We need some form of orientation, a guideline. We found it helpful that this discussion arose during the pandemic as we need to know what society expects of us."

So, how should the decision be made now when there is only one bed available in intensive care and two patients? The new statutory regulation states that the decision must be based solely on the short-term probability of survival. However, what counts as "short-term" is not clearly defined. "That is better than no statement at all, but it only helps to a certain extent," says Windolf. "Although statistics exist on the probability of survival for this or that illness, we can never really predict the individual case. This or that illness situation may have a certain probability of survival in statistical terms, but this says nothing about the situation on the ground at that moment." Orientation to short-term probability of survival helps a little at least, but other options would also have been conceivable: For example, longer-term life expectancy could play a role, evaluation of quality of life or even drawing lots were all seriously discussed.

"We need doctors who will fight unconditionally for their patients and act as their lawyers."

Professor Frank Dietrich — philosopher

Professor Frank Dietrich

PHOTO CITLALI GUITERREZ

PHOTO CHRISTOPH KAWAN

The decision that has now been taken sounds easier than it is, as Dietrich explains: "Patient A has a 10% probability of survival without intensive care ventilation, which would increase to 50% if they were to receive the required therapy. Patient B has a 50% probability of survival on a general ward, which would increase to 80% if intensive care measures were to be initiated. Where the greatest increase in probability of survival is the key factor, then patient A should be chosen; if the higher probability of survival in absolute terms counts, then patient B."

In Windolf's experience, this is an interesting issue in theory, but day-to-day life in hospitals does not work like that. Although score systems exist in medicine for determining probability of survival or extent of treatment, "they are used for research purposes and only offer a probability, no certainty. They are statistics for collectives, not calculations for individuals, and as such we can only warn against them."

From the point of view of legislators and in the opinion of many experts, the decision to select short-term probability of survival as the relevant criterion is a sensible choice. "The decisive factor is that taking the prospect of success into account increases the chance of being saved by intensive care treatment in the case of a life-threatening condition for each and every individual," says Frister. Philosopher Frank Dietrich is not so quick to agree: "I am still considering this. I believe that the statutory regulation can be justified and I would like to be able to defend it, but there are still a few issues with it."

Is triage discriminatory?

Dietrich is currently considering issues of discrimination. Direct discrimination is easy to recognise, for example, where a person is disadvantaged as a consequence of belonging to a specific, easily recognisable group. Gender or skin colour are simple examples of this. However, in addition to easily recognisable, direct discrimination, discrimination can also be indirect, e.g. where a seemingly neutral criterion is applied in a selection process which ultimately results in members of a

"The state can never be allowed to judge the quality of human life. This led to "euthanasia" under the National Socialist regime and so this criterion can never be applied in Germany."

Professor Helmut Frister — legal expert

specific group being disadvantaged. "And this disadvantage may not be intended at all," stresses Dietrich. Even the statutory regulation on triage which has now been passed could potentially discriminate against older people as their short-term probability of survival is lower in many cases due to their age. This could indirectly lead to older people being disadvantaged, as the existence of severe comorbidities will also play a role in the assessment of probability of survival. However, according to the philosopher, there is an aspect of age that differentiates it from all other discrimination factors such as skin colour or gender. "Which age group a person belongs to changes over the course of their lifetime – even those who are young today will be elderly one day." Accordingly, all members of society are affected in the long term and it is therefore easier to justify disadvantaging someone because of their age rather than because of other characteristics.

Are older people at a disadvantage?

Triage is a life-or-death decision. "It is such an important decision that it cannot be taken by one person alone," says Frister. Legislators have therefore introduced the "dual control" principle and specify that the decision cannot be taken by two medical professionals who work closely together. And on top of this: If one of the two patients has a disability, a doctor who is an expert on this disability must also be involved. This is due to the concern or experience that medical professionals

PHOTO PAUL SCHWADERER

may also be prejudiced against people with disabilities which could, in the event of an emergency, lead to the probability of survival of a person with a disability being assessed as lower than it really is. As such, this is a good decision, even though it is probably difficult to implement in practice. "To a certain extent, this is a sensible regulation," says Frister. "And I believe that you could realise such a decision-making process in a large clinic like the University Hospital here in Düsseldorf. However, in smaller hospitals in the countryside it would not really be feasible."

Windolf also considers the regulation sensible, "but we do that anyway. Such a decision is never taken by just one person." Consulting colleagues from other disciplines is also already standard practice in Windolf's experience. "As doctors, we are sometimes also confronted with such borderline decisions outside the framework of Covid or a war situation, e.g. in intensive care medicine, and we always make them in a team. But, as I said, it is definitely helpful if society takes a clear position on this topic."

Medical training needs to be modified

Legislators have also stated that medical training needs to be modified in this regard. Even though the criterion of short-term probability of survival is perhaps not without problems, all alternatives for deciding the issue of prioritisation are worse choices in the eyes of Dietrich and Frister. Quality of life cannot be chosen, as it is not something that can be judged by a third party. Anyone who judges the quality of life of another person could quickly find themselves "on the wrong track", as it were, because legal experts consider that to be only a small step away from declaring a life "unworthy of life".

"The state can never be allowed to judge the quality of human life. This led to "euthanasia" under the National Socialist regime and so this criterion can never be applied in Germany." Remaining life expectancy is also not an appropriate criterion for the same reason. The question also arises as to "what to do in the case of children who have a lower life expectancy than healthy adults due to an illness." All this leaves drawing lots as a decision-making criterion, which was actually proposed by experts as a fair option. "I find the idea of drawing lots problematic as a potential consequence could be that we end up allocating limited treatment places in an inefficient way," says Dietrich, "and in the worst case scenario, we would save fewer lives than we could actually save." Frister also points out that drawing lots

PHOTO CHRISTOPH KAWAN

Professor Joachim Windolf

"We need some form of orientation, a guideline. We found it helpful that this discussion arose during the pandemic as we need to know what society expects of us."

Professor Joachim Windolf — physician

would not utilise specialist medical knowledge and the expertise of doctors to maximum effect, which would in turn make it an inappropriate criterion.

Certainty for patients

Initial prioritisation is already difficult enough and even deciding on that does not mean that the issue has been clarified once and for all. In addition to ex-ante triage – i.e. the decision on which of the two or more patients should be allocated the free intensive care bed – there is also the option of ex-post triage. This means that not only would the one free ventilator place be allocated, but also that all patients in intensive care would have to be reviewed again on a regular basis to check that their intensive care treatment remains justified or whether a new patient has a stronger claim to the place. Under the current law, ex-post triage is definitively forbidden, but it was still included as a possibility in the initial draft of the law. "Due to public opinion, however, the Federal Minister of Health changed his mind on this," says Frister, even though the majority of criminal law experts and medical professionals on the Committee on Health had spoken in favour of ex-post triage during the course of the legislative process. "The problem with the ban on ex-post triage is that it renders the criterion of short-term probability of survival virtually meaningless. Imagine a situation where there are 30 ventilator beds, all of which are occupied, yet several of the patients have only a very low probability of survival. If there is ultimately only one bed left and two patients arrive at the same time, then the decision is made on the basis of the criterion of short-term probability of survival. However, the importance of the criterion is minimised to the short period where only one bed is available."

By contrast, Dietrich is clearly against ex-post triage. He does not want those who already have a bed to be taken into account again in future allocation decisions. "I believe that, although there are important fairness reasons for taking all patients needing intensive care into account in such a decision, this practice would seriously impact the doctor-patient relationship." In the worst case scenario, patients would not disclose all conditions to their doctors to prevent the information possibly being used against them. "We need doctors who will fight unconditionally for patients and act as their lawyers. Ex-post triage would make doctors more like judges who have to weigh my interests against those of others." Windolf sees this the same way. "Ex-post triage would be an enormous psychological burden for doctors and nursing staff. Just imagine this situation: You treat a patient for ten days and do everything you can to ensure they can survive and then you suddenly receive the order to stop. It could ultimately also result in a situation where patients would no longer be able to rely on everything being done to help them."

So, even though there is now a law for the (unlikely) event that triage is needed during a pandemic, the issue has still not been finally settled. There is still a wide range of opinions that have not been considered – and too great a reluctance to think the issue through to the end.

PHOTO CITLALI GUITERREZ

New “MibiNet” Collaborative Research Centre for “Microbial Networking” at HHU

A microbe never or: how work together

Microscopic cross-section of a *P. rufescens* community: A fungus (mycobiont; blue) forms the cortex, which contains a pronounced zone in which the cyanobacteria (photobiont; green) are embedded.

ILLUSTRATION MICHAEL FELDBRÜGGE, LEA GEISSL

walks alone — microorganisms

BY ARNE CLAUSSEN

This year, the German Research Foundation (DFG) newly established the Collaborative Research Centre (CRC) 1535. Headed by spokesperson Professor Dr Michael Feldbrügge from HHU and co-spokesperson Professor Dr Julia Frunzke from *Forschungszentrum Jülich* (FZJ), a team comprising research groups from four universities and two research facilities is seeking to understand how microbial communities interact. They also intend to build complex communities synthetically. Decoding microbial networking is of great importance for applications in agriculture, medicine and biotechnology.

PHOTO STEFFEN KÖHLER

Professor Dr Michael Feldbrügge is spokesperson and Professor Dr Julia Frunzke is co-spokesperson of the new Collaborative Research Centre 1535 MibiNet.

Microbes are not solitary entities. They virtually always live together with other types of microbes in large communities, in which they both cooperate and compete with each other. While one type might provide nutrients for example, another may protect the community from intruders. Professor Feldbrügge: "Microbes are similar to people in that there are good and bad characters. The latter harm the community and must be kept away for the good of all other members."

New thinking – microorganisms live in communities

To date, research into microbes has mainly been conducted under isolated conditions. Professor Frunzke: "In classical microbiology, an individual microorganism is observed in a pure culture. This has enabled various processes to be explained in molecular detail. However, this old way of thinking falls short; it fails to recognise that microbial traits evolved in the context of interaction."

The new CRC is aiming to counter this old way of thinking with a completely new research approach, which Professor Feldbrügge formulates as follows: "We want to understand how the communities evolve and function, how they are composed and how they control their processes."

One example of a microbial network is the microbiome of the human intestine. The microorganisms it contains – bacteria, fungi, archaea and viruses – are of fundamental importance for the digestive process and nutrient uptake. Without them, a person could not survive. A healthy microbiome can also effectively fight pathogens entering the body via the intestine.

In addition to these communities of different cooperating microorganisms, each individual cell contains subunits like organelles that communicate with each other in a process called intracellular networking. Chloroplasts – in which photosynthesis takes place in plants – and mitochondria – the "powerhouses" of cells – are two examples of organelles in eukaryotic cells, i.e. cells with a nucleus.

"Some organelles were originally independent microorganisms, which were absorbed and permanently incorporated into the cells during evolution. This happened around 1.5 to 2 billion years ago. These "endosymbionts" have lost much of their independence over the course of time and surrendered the majority of their DNA to the host cell.

The team headed by Professor Dr Eva Nowack from the HHU Institute of Microbial Cell Biology recently reported on an example of related research in the scientific journal Current Biology: the flagellate *Angomonas deanei*.

It incorporated a bacterium relatively recently (between 40 and 120 million years ago). This bacterium supplies the flagellate with vitamins and metabolites; it is already so dependent that reproduction occurs synchronously and the genome is reduced, but not yet to the same extent as in mitochondria.

Communication is key in communities

Communication between the individual partners is critical for both types of networks. "In the case of networks within a cell, e.g. cell division must be coordinated," stresses Feldbrügge. "It would be fatal if cell organelles were to divide uncontrolled."

Such communication processes usually occur chemically via the exchange of signalling molecules. They dock with special receptor molecules on the cell or organelle surface, triggering a reaction from the recipient. To understand the processes within a cell, biosensors are employed, which can e.g. prove the availability of the signalling molecules.

Once an understanding has been gained of how microbial networking works, it will be possible to replicate it synthetically. Julia Frunzke: "We are pursuing a synthetic biological approach. Once we have understood the key exchange processes and dependencies, we intend to use our knowledge to produce synthetic networks. If they do not work, then our understanding is not yet complete."

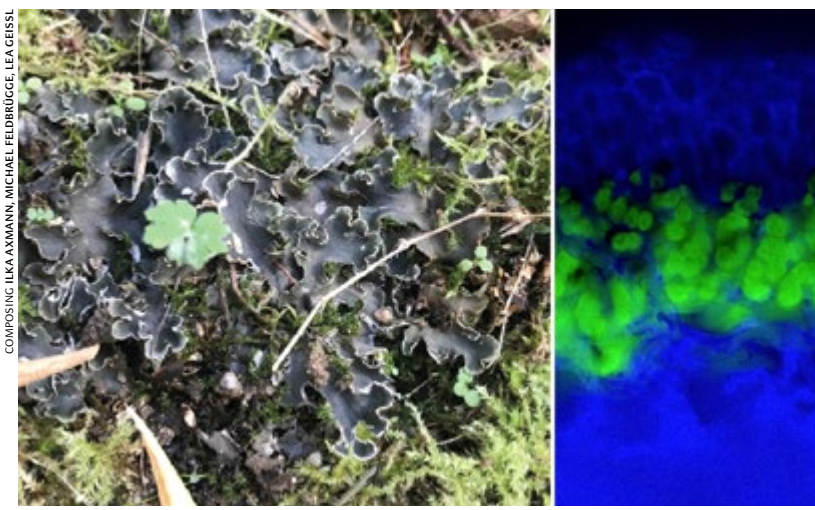
Bacteria for biotechnology

Professor Feldbrügge: "Bacteria such as *Escherichia coli* are already being used in many areas in the bioeconomy to produce substances such as human insulin. Networks of multiple, cooperating bacteria can enable the production of significantly more complex manufacturing chains for fine chemicals." For example, using sunlight as an energy source, a photosynthetic cyanobacterium can produce sugar. It can then pass this sugar on to other bacteria, which can in turn produce complex substances from it. Frunzke: "This may support our transition to a sustainable bioeconomy by harnessing the energy of the sun for the production of value-added compounds."

Microbial networks are also particularly interesting for research and applications for many other aspects. They can influence entire ecosystems. "Lichens are one example," comments Professor Feldbrügge. "They are communities of fungi and either algae or bacteria. Lichens frequently occur in extreme regions such as the Arctic, where they are one of the few forms of life, which can in turn provide food for other creatures – such as reindeer."

A key issue for the practical usability of such synthetic communities is how they can be established and stabilised in the long term. A central technology is the so-called microfluidics system. It enables the cultivation of cells in very small fluid chambers with controlled inflows/outflows. It also enables the creation of synthetic cells. The technology

> "In conventional microbiology, an individual microorganism is observed in a pure culture. This has enabled various processes to be explained in molecular detail. However, this old way of thinking falls short; it fails to recognise that microbial traits evolved in the context of interaction."
>
> **Professor Julia Frunzke — biologist**



COMPOSING ILKA AXMANN, MICHAEL FELDBRÜGGE, LEA GEISSL

The field dog lichen (*Peltigera rufescens*) is a community comprising a fungus and a bacterium, as the microscopic image on the right shows.

Example of a microfluidic system. The image shows a glass block containing tiny fluid chambers. It allows the precise observation of communities of microorganisms.

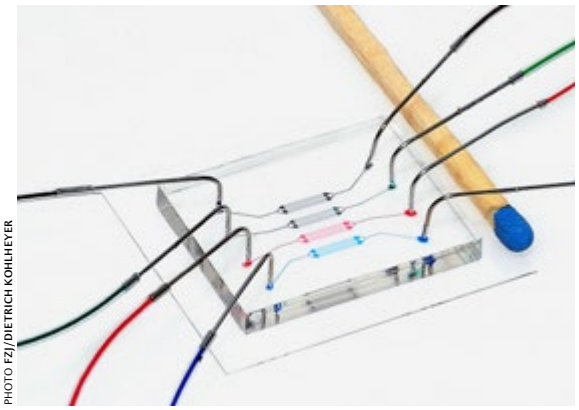


PHOTO FZJ/DIETRICH KOHLHEYER

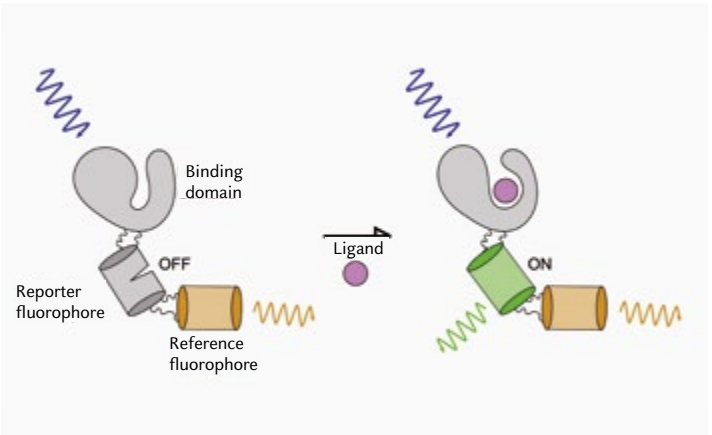


ILLUSTRATION ATHANASIOS PAPADOPOULOS

The "Matryoshka" biosensor: The inactive biosensor can be seen on the left. When light is shined on it, only the reference fluorophore emits orange-coloured light. If a molecule relevant for the measurement (ligand) binds to the docking point, activating the biosensor, a structural change occurs. This conformational change also activates the reporter fluorophore, which emits green fluorescent light when light is shined on it. Both orange and green light are then measured; the ratio of the two types of light enables conclusions to be drawn about the concentration of the ligand.

can be used for the targeted control and study of exchange and communications processes.

The new CRC 1535 "MibiNet" comprises twelve research groups, three central projects and the integrated Graduate School "MibiNext". "The research groups are working together across multiple institutes," says Michael Feldbrügge. The research objectives are formulated in such a way that they can only be achieved together. "This collaborative aspect – every member of a sub-project has complementary expertise – was one of the key factors in the decision to award the funding to the CRC as it is closely aligned with the new DFG objective of focusing on the establishment of such "CRC 3.0" projects, which can only achieve success through intensive collaboration, in the future."

Research targets can only be achieved by collaboration between institutes

Dr Lilli Bismar, Coordinator of the Graduate School, adds: "MibiNext is all about giving future microbiologists and quantitative biologists a new 'spirit' during their training so they can focus directly on microbial connectivity and be capable of handling complex data sets."

CONTACT
Professor Dr Michael Feldbrügge
Institute of Microbiology
michael.feldbruegge@uni-duesseldorf.de

Professor Dr Julia Frunzke
Institute of Bio- and Geosciences – Biotechnology (IBG-1) at Jülich Research Center
j.frunzke@fz-juelich.de

The Collaborative Research Centre CRC 1535 "Microbial networking – from organelles to cross-kingdom communities" (MibiNet) was launched on 1 January 2023 and comprises three funding periods. The funding for the first four years totals around 11 million euros. In addition to HHU and FZJ, further partners include Aachen University of Technology (RWTH), Bielefeld University, the University of Cologne and the Max Planck Institute for Plant Breeding Research in Cologne.

PHOTO STEFFEN KÖHLER

Study on the influence of social media on art market prices

Instagram? – A catalyst

Who decides what an artwork is worth? Why does a Gursky cost millions, while you can buy a work by the artist Joe Bloggs for €500? And would anything change in this regard if Joe Bloggs put more effort into their Instagram profile?

Maxi-Alexandra Loede has examined the "Influence of Social Media on the Pricing of Contemporary Art" in her master's thesis in the "Art Mediation and Cultural Management" study programme. One reason why her supervisor, Dr Julia Römhild, considers the study important is that, although assumptions about the factors influencing art market pricing are made in practice and in literature, there is very little empirical evidence to back them up.

The study programme is a collaboration between the Faculty of Arts and Humanities, and the Faculty of Business Administration and Economics. Business administration expert Dr Römhild always finds it fascinating to see how humanities students suddenly find themselves having to navigate the world of pricing and marketing, and then learn how to view the art market from a business perspective. Pricing is a particularly sensitive topic as "there is very little transparency and an ongoing lack of clarity about how prices on the art market are determined. We can list a number of influencing factors, but the situation is never entirely clear," says Römhild.

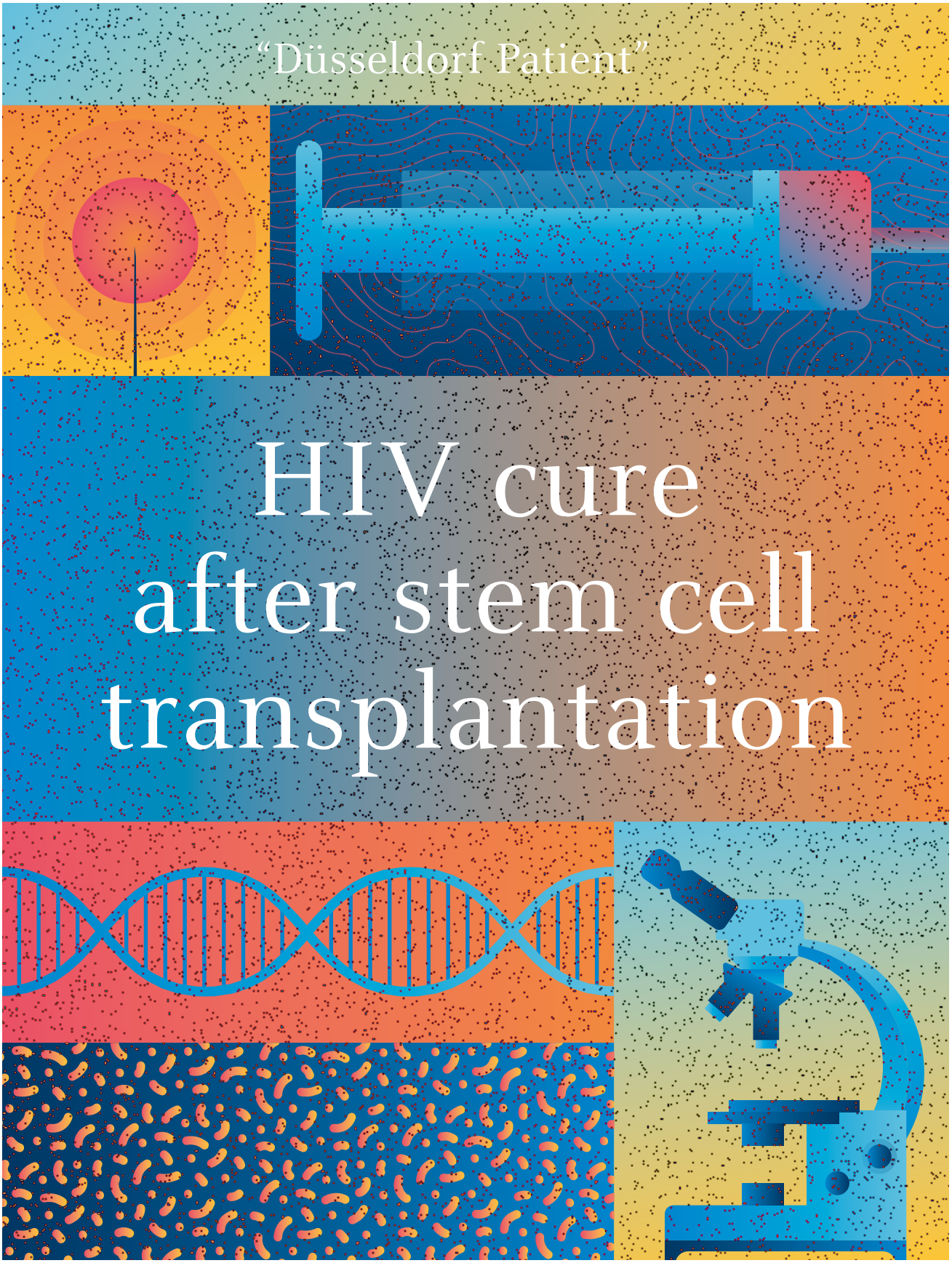
Expert interviews confirm an influence

On the basis of interviews conducted with seven experts, Loede has attempted to shed some light on the topic. She asked art market economists, artists, gallery owners and art bloggers whether social media have an influence on pricing and all confirmed that is the case. But exactly how great is that influence? Even following completion of the study, it cannot be quantified in figures as art buyers are an extremely heterogeneous group. An older, wealthy couple is less likely to be interested in an artist's Instagram profile, but more willing to invest higher sums. By contrast, Instagram profiles are important to young people, who may even discover artists via the platform. However, they have less money to spend. "We can observe that the number of followers can act as a reference for inexperienced art buyers," says Loede. "At the same time, a large number of followers can indicate higher demand, which in turn helps push prices up."

Showcasing the creative process

Instagram also represents a good opportunity for young artists to raise their profile: "A visual medium not only allows the finished artwork to be displayed, but also provides a showcase for the creative process," Römhild continues. Loede adds: "Social media activity can influence price as it supports an artist's brand development." However, as the interviewed experts represented different positions, it is still not possible to provide a definitive answer as to whether artists with an Instagram profile will be more successful in the coming years than those without. "It is likely that Instagram acts as a catalyst for building on a well-established basis," Loede says. Genuinely unsuccessful artists will not become successful, even with an attractive Instagram feed, while Instagram can be a useful supplement for successful artists but it is not the be-all and end-all for achieving fame. V. M.

> "At the same time, a large number of followers can indicate higher demand, which in turn helps push prices up."
>
> **Maxi-Alexandra Loede — graduate of the Cultural Management study programme**


"Düsseldorf Patient"
HIV cure
after stem cell
transplantation

BY SUSANNE DOPHEIDE

The so-called "Düsseldorf Patient", a man now aged 53, is just the third person worldwide to have been completely cured of HIV via stem cell transplantation. As in the case of the other two patients (Berlin Patient and London Patient), the transplantation was undertaken to treat an acute hematologic disease, which had developed in addition to the HIV infection. The team of doctors in Düsseldorf headed by Dr Björn-Erik Ole Jensen, a specialist in infectious diseases, and the haematologist Professor Dr Guido Kobbe, both from Düsseldorf University Hospital, have now presented the steps taken to cure the "Düsseldorf Patient" in their current publication in the renowned scientific journal, Nature Medicine.

Almost ten years after the stem cell transplantation and more than four years after ending the HIV therapy, Marc – the patient – is now in good health. The fact that the virus has not returned is the result of extremely thorough scientific and therapeutic preparation and monitoring of the patient's health.

Planning further studies

The international research team headed by the medics in Düsseldorf hope the knowledge gained will provide starting points for planning future studies into cures for HIV. Due to the risks involved, stem cell transplantation is only carried out within the framework of treating other life-threatening diseases. Consequently, research must now be continued to enable patients to overcome HIV infections without the need for this intervention in the future.

The initial diagnosis came in 2008 and, six months after starting his HIV therapy at Düsseldorf University Hospital, the "Düsseldorf Patient" was diagnosed with acute myeloid leukaemia (AML), a form of blood cancer that is life-threatening. In 2013, following the return of his leukaemia after the initial chemotherapy, Marc underwent a blood stem cell transplantation. This operation transfers another person's immune system, which is capable of attacking the malignant cells. This therapeutic principle also makes it possible to cure patients who would be unable to beat leukaemia solely through chemotherapy. "From the outset, the aim was to treat both the leukaemia and the HIV," says Professor Guido Kobbe, who performed the transplantation in Düsseldorf. The stem cells taken from the donor exhibited a specific mutation in the CCR5 gene (CCR5Delta32 mutation). This rare genetic mutation, which is predominantly found in central and northern Europe, results in the absence of a docking site for HIV in immune cells, providing good protection against infection with the virus. "Of course, the donor also needs to be as identical as possible with regard to genetic tissue characteristics," says Dr Jensen. This was successful, enabling the stem cell transplantation to treat both diseases.

This matter-of-fact scientific report actually meant a long and difficult process for the patient in practice. Professor Guido Kobbe describes the situation: "The patient deserves great praise. It is not easy to fight two such serious illnesses in an extremely long therapy process and not lose heart in the face of setbacks. The leukaemia returned more than once – initially after the primary chemotherapy and then again following the blood stem cell transplantation. However, our patient was always very, very motivated and optimistic." In 2018, following careful planning and with constant, close monitoring by the team of doctors treating the patient, the anti-viral HIV therapy – which had ensured that any residual HIV was kept under control up to that point – was ended.

To ensure it was ultimately possible to talk of a cure, extensive tests were conducted throughout this period, for example to establish whether evidence of replication-capable HIV cells could still be found. In the publication in Nature Medicine, the authors describe in detail which additional indicators they reviewed to enable them to exclude any remaining active HIV infection and thus now assume a cure.

"Following our intensive research, we can now confirm that it is fundamentally possible to prevent the replication of HIV on a sustainable basis by combining two key methods."

Dr Björn Jensen — specialist in infectious diseases

Following the world's first report in 2009 that a stem cell transplantation from a donor with the described specific gene mutation can in principle cure an HIV infection, many questions about the prerequisites remained unanswered. The detailed virological and immunological analysis of the blood and tissue of the "Düsseldorf Patient" now provides important insights for future HIV research – as Dr Björn Jensen, specialist in infectious diseases, describes: "The most important results are further findings relating to the immune system and what role the transplanted immune system plays in eliminating HIV cells remaining in the reservoirs. HIV-1 is capable of forming a long-lived viral reservoir by inserting "viral blueprints" into the genetic material of long-lived immune cells, from which replicable virus cells can subsequently be produced."

Detailed analysis of blood and tissue

These findings are important for future cure strategies as well as with regard to the monitoring of patients treated with other cure strategies. It is essential to know which examinations need to be conducted in order to be sure that the virus has really been beaten after the end of the anti-viral HIV therapy. On behalf of the international team, Dr Björn Jensen says: "Following our intensive research, we can now confirm that it is fundamentally possible to prevent the replication of HIV on a sustainable basis by combining two key methods: On the one hand, we have the extensive depletion of the virus reservoir in long-lived immune cells, and on the other hand, the transfer of HIV resistance from the donor immune system to the recipient, ensuring that the virus has no chance to spread again. Further research is now needed into how this can be made possible outside the narrow set of framework conditions we have described."

"Our team decided to take a very cautious and extremely thorough approach. The focus naturally lay on achieving the greatest possible benefit for our patient. However, we were also aiming to make a significant contribution to understanding the success factors of

PHOTO ISTOCKPHOTO.COM – KAEART

such a therapy," says Professor Dr Tom Lüdde, co-author and Director of the Department of Gastroenterology, Hepatology and Infectiology at Düsseldorf University Hospital, where the treatment was carried out.

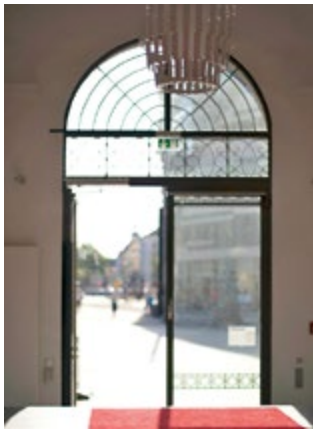
Life without HIV medication

According to Professor Kobbe, what makes the case of the "Düsseldorf Patient" special is "that we can now look back over ten years of monitoring his treatment. This means that we can have a lot of confidence in all statements we make with regard to the process and that we have gone beyond the periods during which any relapse can be expected. Many other researchers were also involved, conducting examinations that would not have been possible in that form in Düsseldorf. A great deal of HIV expertise from around the world has flowed into the project. We can honestly say that our patient is without doubt the best documented patient where the simultaneous treatment of both conditions has ultimately led to making a life without HIV medication possible for him."

Marc should have the last word on the subject, and he quotes his GP: "I was diagnosed with HIV in 2008. I remember well that my GP said, "don't take it so hard. We will see HIV cured in our lifetime." At the time, I dismissed the remark as him just trying to cheer me up. So today, I'm all the more proud of my global medical team, who have actually succeeded in curing me of HIV. On Valentine's Day 2023, I threw a big party to celebrate the ten-year anniversary of my bone marrow transplant, with my donor as the guest of honour."

The team of doctors in Düsseldorf headed by Dr Björn Jensen, a specialist in infectious diseases, and the haematologist Professor Dr Guido Kobbe, both from Düsseldorf University Hospital, have now presented the steps taken to cure the "Düsseldorf Patient" in their current peer-reviewed publication in the renowned scientific journal, Nature Medicine.

Heinrich Heine University Düsseldorf



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.

Further information, programme, bookings:
Haus der Universität
Schadowplatz 14
40212 Düsseldorf
Tel. +49 211 81-10345
hdu@hhu.de
hdu.hhu.de

Director: Professor Dr Georg Pretzler **Programme Development:** Dr Heidrun Schnitzler **Event Planning and Support:** Susanne van Putten