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Preface
2012 and 2013 have been eventful years. The Institute’s Development Plan 2011/2012 could be implemented entirely – though exclusively by securing third-party funding. The Plan was entitled “Translation”, a term that recently appears overused, but in fact was chosen as the objective for the newly established German Centre for Infection Research (Deutsches Zentrum für Infektionsforschung, DZIF). Thus, to a large extent, the 2011/2012 Plan could be realised through the Institute’s participation in DZIF. We are lucky that the German Federal Ministry of Education and Research (BMBF) for DZIF does not restrict itself to funding short-term projects but, for the purpose of sustainability, envisions a long-term institutional support – just as it does for the other German Health Research Centres. The support is being viewed as a sustainable investment – as long as the scientific deliverables are there. If not, one would have to consider alternatives. DZIF was founded in 2012 but full financial support will not start before 2015. For this reason, full implementation of the 2011/2012 Development Plan cannot occur earlier. Not least of which was the reason to lay out future Development Plans of the Institute over not just two, but rather four to five years.

Participation in DZIF not only supported “translational” research at the Institute. The DZIF’s principle of “Partner Sites” for the Hamburg area drew in the Faculty of Mathematics, Informatics and Natural Sciences (MIN) from the University of Hamburg (UHH), the University Medical Center Hamburg-Eppendorf (UKE), and the Medical Faculty of the Universität zu Lübeck as well as the Heinrich Pette Institute - Leibniz Institute for Experimental Virology (HPI) and Research Center Borstel - Leibniz Center for Medicine and Biosciences. All partner institutions agreed to participate in DZIF under the title of “Global and Emerging Infections”. A perfect fit for BNITM’s endeavours to address this topic on a broader scale regionally.

What is still missing is an interdisciplinary component although the topic indeed appears predestined for interdisciplinary research. For example health-related economic, social or legal aspects, to name but a few that are of major importance in the global control of infection. BNITM had made initial interdisciplinary approaches to the sociology and legal faculties of UHH in 2008; unfortunately, realisation of this
approach through support from the initiative for excellence programme of the state government has not been successful.

Prof. Chris Meier from the MIN Faculty at UHH together with partners from UKE, HPI, and BNITM, again applied to the Hamburg Administration for Science and Research (Behörde für Wissenschaft und Forschung, BWF) for funding of an interdisciplinary graduate programme in late 2013. The plan probably makes sense, having its own expertise in medicine and the natural sciences at the outset and successively including partners from other disciplines – even if perhaps initially for teaching only and then later for research.

Strong support for interdisciplinary approaches most recently comes from the Leibniz Association. Instigation came from a document of the Scientific Advisory Board to the Federal Government (Wissenschaftsrat) in 2012 entitled “Perspectives on Germany as a Site for Science” (Perspektiven des Wissenschaftstandorts Deutschland). The document praises the independence of the Leibniz Institutes, but in particular underlines the suitability of their diverse research agendas for interdisciplinary approaches. Since then, networking euphoria has been spreading throughout the Leibniz Association.

Similar to the paradigm of ‘Translation’, ‘Systems Biology’ is currently enjoying great scientific popularity – and numerous interpretations. It started with the discovery of cell biologists that it is not the study of the individual component that provides insight into cellular reactions or the origin of disease, but instead the analysis of all contributing components influencing one another in many ways.

In this sense, Systems Biology may as well be interpreted more broadly, e.g. describing the social, economic, and other influences on the individual disposition to an infectious disease (“exposome”), and also on the propagation and control of epidemics. In the 2013-2017 BNITM Development Plan, the term “Systems Biology” is therefore applied to cellular and molecular biology as well as to epidemiology and clinical research. In clinical research, i.e. research that proceeds from symptoms, the approaches of Systems Biology – or in this case, Systems Medicine – present a particular technological challenge. What is required is not the analysis of just an individual cell type, but of a complex organism like a human being. And again, a decision has to be taken of whether an institute like BNITM, focussing on a highly specialised research topic as it does, should also attempt to highly specialise in a very particular laboratory technology.

A challenge of a completely different sort arises from the developmental dynamics of countries located in the Global South, as the World Bank sums up the developing and emerging countries. On the one hand, there are the needs of local health care. It has become apparent that changes in environment and lifestyle cause a sharp climb in the occurrence of what is known as diseases of civilisation or, in technical terms, non-communicable diseases (NCDs). These diseases have since begun to cause, among physicians, politicians, and scientists in the affected countries, greater concerns than the classical tropical diseases. Of course, BNITM will not dedicate itself to researching NCDs, but cannot ignore the interests of its partners in the endemic countries. A constructive compromise would be to include in epidemiological studies experts in NCD research. Ideally, within a Leibniz network.

On the other hand, justified ambitions of researchers in the Global South toward establishing their own scientific agenda continue to grow. With the gradual transfer of greater responsibilities to colleagues in Ghana at the Kumasi Centre for Collaborative Research (KCCR) that has begun, BNITM appears to be on the right path, one that many other international institutions have not started down yet. Our partners in Ghana have shown their satisfaction with the progress of KCCR thus far and have indicated their willingness to extend the State Agreement negotiated in 1998 over the long term with nearly no modifications. This would be of great benefit for BNITM because, at the expiry of the current contract in late 2017, all facilities and equipment of KCCR would otherwise become property of our Ghanaian partners.

The changes in the Global South also affect the Deutsche Gesellschaft für internationale Zusammenarbeit (GIZ). As several developing countries have grown into quite powerful emerging economies financially, GIZ no longer views itself just as a project manager for the German Federal Ministry for Economic
Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung, BMZ), but instead increasingly as an agent for world-wide promotion of German expertise. In this sense, GIZ has begun – with a little encouragement from the Federal Ministry of Health (Bundesministerium für Gesundheit, BMG) – to explore fields of conceivable collaboration with BNITM. GIZ is very important for BNITM due to its close ties with BMZ. This is because all BNITM activities in the endemic countries have significant components of developmental collaboration, such as essential health care of entire African villages as part of epidemiological studies, and especially basic and advanced training of scientists in developing countries. We therefore found greater interest on the part of BMZ in the work of BNITM to be appropriate.

A certain section in the Coalition Agreement signed between the CDU and SPD parties in forming the new German government in November 2013 is a memorable one for the Institute. The paragraph describes the announcement by the government of its intent to strengthen research in "neglected diseases associated with poverty". As the sole institute working on this research topic in a reliable and sustained manner in Germany, BNITM must consider this statement as an instruction to develop ideas and plans for implementing the intentions of the new federal government.

There were also a few trivial practical items to report during 2012-2013. The BSL-4 laboratory as well as the BSL-3 insectary went into full operation following a tedious era of construction and corrections. The corporate design of the Institute was revised. Following extensive consideration of history and spirit of the times, the logo was modified only slightly and supplemented with the abbreviation "BNITM" in order to make the Institute recognisable also in cases when the logo is greatly reduced in size. BNITM was selected for the abbreviation instead of BNI as BNI in Ghana, for example, stands for Bureau of National Investigation - the national secret service -, and this confusion has not always been helpful.

The Board of Directors would like to thank the staff of the Hamburg Administration for Science and Research (BWF) and the Federal Ministry of Health (BMG), who are tasked with overseeing the Institute, for their great understanding and assistance in coping with what were in part demanding formalities during the continued development of the Institute. A special thanks goes to State Secretary Dr. Horst-Michael Pelikahn, who in his responsibility as Chairperson of the Board of Trustees has represented the interests of the Institute with great diligence and prudence, but with great expediency as well. At this point I would also like to belatedly thank again the former Ministerial Director Dr. Peter Lange. As the representative of BMBF on our Board of Trustees, he remained a loyal supporter of the Institute for nearly twenty years, even as he climbed the ministerial hierarchy to being department head, and the time-consuming effort on behalf of a small Leibniz Institute lay far beneath his job description. His advice, to which his expertise, acumen and personal authority lent great weight in the Board, had a lasting influence on the development of the Institute.

We are also indebted to the members of the Scientific Advisory Board, who sacrificed their valuable time to familiarise themselves with our scientific and organisational challenges and advise us expertly. In particular we thank the Chairperson, Prof. Klaus Lingelbach, for his very special efforts. Last but not least, we thank our supporters from the Vereinigung der Freunde des Tropeninstituts (Association of Friends of the Institute), Manfred Schüller and Dr. Lothar Dittmer at the beginning of the reporting period took over as Co-Chairs of the Association. Each in his own way, one as an advertising professional, the other as an experienced board member of a large foundation, has brought energy and enthusiasm to the Friends on the one hand, while critically analysing and updating the format and target group on the other.

Our staff members have earned our great appreciation for their constant and extraordinary loyalty and identification with the Institute. Once again I would like to highlight the additional work of my colleagues who have participated as representatives in the Institute’s staff council and numerous other committees.

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SCIENTIFIC ADVISORY BOARD
The Asian bush mosquito (Ochlerotatus japonicus) is known for its capability of transmitting various viruses. It originated in Asia, where it primarily inhabits forested areas in the northern part of Japan and Korea. Similar to the tiger mosquito, it has spread over vast parts of the world in the course of international trade in the last decades. In Germany, Oc. japonicus was first detected in 2008 when it arrived from Switzerland, settling initially in the state of Baden-Württemberg. Since that time, it has there been found practically everywhere and can be viewed as indigenous. Stable populations have also been observed in the states of North Rhine-Westphalia and Lower Saxony beginning in 2012. On account of the rapid propagation to several distant states, its ability to breed vigorously, and its minimal climatic requirements, it must be assumed that Oc. japonicus will propagate in the coming years to all areas of Germany with suitable forests.

Figure: Spread of the Asian bush mosquito (2011-2013). Red dots indicate locations where larvae have been found in Baden-Württemberg, while green dots show collection sites where no larvae have been found (Illustration: Katrin Huber, Community Action Alliance for Mosquito Control [KABS]).
The common house mosquito *Culex pipiens* (aka *Cpp*) is one of the most frequently encountered mosquito species in Germany. There are two different biotypes and an additional species named *Culex torrentium*, whose females cannot be distinguished under the microscope but show different biting behaviour. While the *Culex pipiens* biotype *pipiens* and *Culex torrentium* species prefer avian blood, the *Culex pipiens* biotype *molestus* primarily bites humans and mammals. Cross-breeding between the types can occur, resulting in hybrids that accept both birds and humans for blood meals, and thus can transmit infections from one to the other.

A typical pathogen transmitted by *Cpp* is the West Nile Virus, a virus that primarily infects birds but can also be transmitted to humans and equines and cause meningitis in these hosts. West Nile Virus originates in Africa but has been carried between continents by migrating birds. Following introduction in the late 1990s, the virus has spread throughout North America and has caused smaller outbreaks in Southeast Europe.

Up to now, West Nile Virus has not appeared in Germany. To estimate whether Germany is at risk, however, and to be prepared if necessary, we have examined more than 16,500 *Culex* mosquitoes from all over Germany using a newly developed molecular test. This has shown that principle West Nile Virus vector mosquitoes are present in Germany and that the *Culex pipiens* biotype *molestus* that prefers humans and mammals is found almost exclusively in southern Germany.

**Rudolf M. et al., PLoS One 2013, 8:e71832**

Martin Rudolf, Christina Czajka, Jessica Börstler, Hanna Josi, Heidrun von Thien, Marlis Badusche, Jonas Schmidt-Chanasit, Andreas Krüger, Egbert Tannich, Stefanie Becker and external cooperation partners (see publication).

**Figure:** Distribution of *Culex pipiens pipiens* and *Culex pipiens molestus* biotypes as well as the *Culex torrentium* species in Germany. Potential regions for the occurrence of bridging vectors through overlapping distributions of these two biotypes are represented in pale red (Illustration: Stefanie Becker).
The tiger mosquito (*Aedes albopictus*) is a vector of various viral diseases in the tropics, in particular dengue fever. In the course of international trade, it has spread from Asia over vast parts of the world. It has since settled in several European countries south of the Alps.

In order to detect immigration into Germany early, we have carried out extensive monitoring measures with cooperation partners since April 2012. Mosquito traps have been set up at potential entry points like airports, railway stations, and motorways. We caught more than 40 specimens at motorway rest areas in the last two years. They apparently originated in Italy and accompanied goods as unwitting passengers through Switzerland and Austria to Germany, because all of them were found on the main routes between Italy and Germany. More extensive monitoring and control measures are required to prevent colonisation and spread of *Aedes albopictus* in Germany because egg clutches and larvae were discovered in addition to the mature mosquitoes in 2013.

Becker N. et al., *Parasitol Res* 2013, 112:1787-1190

Egbert Tannich and external cooperation partners (see publication)

*Figure:* Tiger mosquito, *Aedes albopictus* (Photography: Andreas Krüger).
The canine roundworm *Dirofilaria repens* is transmitted by mosquitoes and occasionally causes skin disease in dogs. If humans are infected, knot-like lesions occur on the skin, and eye infiltration or meningitis may develop worst case. The parasite has originally been prevalent only in the warm countries of Africa, Asia and the Mediterranean basin. However, increasingly frequent reports of indigenous infections in recent years have appeared in more northerly countries like Austria, the Czech Republic, and Poland. Apparently climate change and in particular importing of infected dogs from southern Europe have allowed the infection to become established in central Europe.

In the course of our mosquito monitoring, we conducted large-scale examinations of mosquitoes from Germany for parasites in 2013 for the first time. A total of approximately 75,000 insects caught in 2011 and 2012 were analysed. Thereby we found repeated instances of *Dirofilaria repens* in mosquitoes from Brandenburg near the Oder River. The results probably mean that a number of dogs in this region are already infected. Obviously there is a need for treatment. Veterinarians and health officials have been informed.


Christina Czajka, Hanna Jöst, Jonas Schmidt-Chanasit, Egbert Tannich and external cooperation partners (see publication)

**Figure:** *Dirofilaria repens* found in mosquitoes at two locations in Brandenburg. A total of almost 75,000 mosquitoes from nine different German states were examined for parasites (Photography and illustrations: Christina Czajka).
Usutu virus was discovered in South Africa and appeared in Europe for the first time in 1996. It affects birds and humans and is transmitted by mosquitoes. In humans, it can cause febrile diseases and meningitis in worst case. Usutu virus caused a die-off of wild birds in south western Germany in 2011, according to estimates with more than 250,000 blackbirds falling victim. In order to be able to estimate the medical significance of the Usutu outbreak, we examined 4,200 samples from healthy blood donors from south western Germany in 2012. Since we could not expect to find viruses in the blood, we searched for serum antibodies, which can still be detected for months or years after infection. One blood donor tested positive. His constellation of antibodies showed that Usutu infection had taken place in late summer of 2011. The blood donor came from the city of Groß-Gerau in the state of Hessen, i.e. from precisely the area where a particularly large number of birds had died. We presently are investigating samples from patients with meningitis in Heidelberg University Hospital to determine whether serious stages of Usutu infection had also occurred in humans.

Allering L. et al., Euro Surveill. 2012; 17(50). pii: 20341

Ludger Allering, Hanna Jöst, Petra Emmerich, Stephan Günther, Jonas Schmidt-Chanasit and external cooperation partners (see publication)

Figure: Origin of blood donors examined for antibodies against Usutu virus (Illustration: Jonas Schmidt-Chanasit).
DNA normally forms a very robust structure from two complementary single strands – the famous double helix – and as a result is exquisitely suited to securely store and exactly duplicate genetic information. In contrast, RNA, although closely related chemically, usually occurs as unstable single strands and can take on diverse functions in a living cell. Nevertheless, single-stranded RNA also serves numerous viruses to code their genetic information. These RNA viruses replicate in infected cells by repeatedly duplicating their RNA. In doing so, they temporarily form double strands of RNA that can be diced into pieces by specialised proteins in the infected cells, and these small RNA pieces called siRNAs then help to destroy the viral RNAs. This mechanism is called RNA interference or RNAi, and plants and insects in particular use RNAi to eliminate viruses. Besides being a natural antiviral defence in plant and insects, RNAi can be used to study gene functions. One can determine the function of a single-stranded RNA molecule by examining what happens if it is destroyed. To do this, we synthesise siRNA matching the sequence of an RNA of interest and introduce it into the cell, thereby targeting for destruction also the single-stranded RNA of interest.

Figure: Principle of RNA interference (Illustration: Stefanie Becker).
It is well known that insects transmit many tropical diseases. It is less well known that they themselves can become ill from the infections and even die.

The fruit fly *Drosophila melanogaster* has been a favourite of researchers for over a hundred years. They are small, lowly, easy to breed, and are neglected by animal rights activists. Over the years scientists have produced fruit flies that have thousands of genetic defects. On one hand, they are used to understand the mode of action of numerous genes and their encoded proteins that have basically remained unchanged in evolution up to humans. On the other, they are increasingly applied to study the immune systems of insects that transmit infections.

Numerous researchers have identified two fundamental mechanisms in viral defence of fruit flies, one being RNA interference (see p.27) and the other a defence mechanism that in its molecular architecture of a "Jak/Stat pathway" closely resembles the innate immune system of humans. To analyse the importance of both pathways for the control of viral replication, we have studied a number of different viruses and found that RNA interference takes on a particularly important role and always contributes to the immune defence independent of the virus, while the Jak/Stat pathway only participates in the defence against some of them.


Stefanie Jansen, Stefanie Becker (née Muller), and external cooperation partners (see publication)

Figure: Male fruit fly *Drosophila melanogaster* (Photography: André Karwath, wikipedia.org).
One of the goals of the coalition agreement signed by the CDU and SPD political parties for the current German government in November 2013 reads: “Through strengthening of research on neglected, poverty-related diseases, and through research collaborations with the affected regions, especially in Africa, we will contribute to breaking the vicious circle of poverty and disease in the developing countries.” It remains to be seen as to how this plan will be realized.

Figure: African child with Buruli ulcer, a neglected tropical disease.
In the initial euphoria about the RTS,S malaria vaccine, the Bill & Melinda Gates Foundation donated many millions of dollars since 2000 to test the vaccine in extended field studies, including also the Kumasi Centre for Collaborative Research (KCCR). A protective level of 35 to 55 per cent was reported, with the observation period being only one year. Figures on long-term efficiency were first published not before 2013; they showed that protection waned after three years at the latest (New Engl J Med 368:1111). Interesting questions were raised by the protection diminishing fastest under high malaria exposure – particularly as animal studies suggest the opposite (see p.35).
One of the main problems in developing a vaccine against malaria—just as with other infections—is short-lived protection. An important requirement for a broad application is therefore not fulfilled, namely the generation of immune memory. In our mouse model, too, the efficiency of a malaria vaccine rapidly diminishes with time. Immune cells against malaria parasites are present after vaccination for a long time, but their numbers are too small. If we infect the animals with the parasite shortly after vaccination, however, the decline of immune cells does not take place, providing long-term protection. This is sufficient to prevent an infection even weeks after vaccination. Therefore, in regions with perennial malaria transmission, vaccinations that offer insufficient protection might actually provide longer-term protection.

Tartz S. et al., Eur J Immunol 2013, 43:693-704

Susanne Tartz, Christina Deschermeier, Bernhard Fleischer, Thomas Jacobs, and external cooperation partners (see publication)

Figure: Following malaria vaccination, the antibody level rises with each new infection ("challenge"). The antibodies bind to molecules on the surface of sporozoites (green), the first stage of the malaria parasite in humans (Photography and illustration: Thomas Jacobs).
Malaria parasites consist of only a single cell, but they carry beneath their surface a complex system of membranes that is called the inner membrane complex (IMC). This structure determines the shape of the parasite on one hand, and on the other it essentially contributes to its motility and enables it to invade our hepatocytes (liver cells) and erythrocytes (red blood cells). Although this membrane system has been known from microscopy for decades, its molecular components have not been studied in detail. We found that a far larger repertoire of proteins than presently known is embedded in these membranes, and that the same proteins take on different tasks, depending on the parasite’s developmental stage.


Maya Kono, Klemens Engelberg, Dipa Sinha, Tim Gilberger, and external cooperation partners (see publication)

Figure: Gametocytes are the precursors of the sexual stages of malaria parasites. They circulate in people’s blood. When taken up by the mosquito and reaching the mosquito’s gut, they develop into male and female gametes – and reproduce sexually. The membranes of the “inner membrane complex” (red) in gametocytes appear to be glued together revealing ring-like structures (green) (Photography: Maya Kono).
Malaria parasites stay inside erythrocytes (red blood cells) the longest time they spend in humans. There they reproduce asexually, and it is during this time that they cause disease. They fundamentally restructure their “host” cells and, for this purpose, need to secrete into them many different proteins. We have shown that an entire complex of pumps is involved that pumps the proteins across membranes that surround the parasite and separate them from the interior of the red blood cell. It draws or pushes proteins in an unfolded state - as strings - through the membranes. It has not yet been established whether a single type of pump does it all or various pumps are used for different proteins instead. As transport of these proteins is essential for the survival of the parasite – and for its pathogenic effect – every individual pump makes an excellent target for the development of new drugs.
Many diseases cannot be diagnosed in sub-Saharan Africa because of insufficient laboratory facilities. Patients are often treated based on clinical grounds and assumptions. As a result, there is a lack of knowledge about the prevalences of infectious agents, their transmission, risk factors, and drug resistances. Besides malaria, tuberculosis, and HIV infections, there are a number of more rare but relevant infectious diseases that have attracted little scientific attention and have therefore been denoted “neglected tropical diseases” (NTDs).

The Research Group Infections Disease Epidemiology (AG May) has established laboratories in Ghana and Madagascar for diagnosing infections over the past years in order to be able to investigate the entire spectrum of infectious diseases for the first time, especially in children.

A start has been made by testing for pathogens that could not be diagnosed so far. Incidences of bacterial blood infections, rare viruses, and multiple infections have been studied as well as risk factors and also the frequency of venereal diseases among adults.

Krumkamp R. et al., PLoS ONE 2013, 8:e80598;
Schwarz N G. et al., Emerg Inf Dis 2012, 18:1690-1692
Hassan Al-Emran, Denise Dekker, Lutz Ehlkes, Andreas Hahn, Josephine Hill, Benedikt Hogan, Anna Jaeger, Caroline Krefis, Ralf Krumkamp, Wibke Leog, Oumou Maiga Askofaré, Nimako Sarpong, Norbert G. Schwarz, Thalea Tamminga, Jürgen May, and external cooperation partners (see publications)

Figure: Ultrasound examination of a child in rural Ghana (Photography: Mika Väisänen).
That amoebas cause disease must be an accident of nature. From all we know, amoebas can only be transmitted during the cyst stage. Cysts develop when amoebas that are able to reproduce and crawl inside the intestinal tract (trophozoites), are encapsulated by a thick layer of chitin, making them resistant to dryness, cold, and stomach acid, if they happen to be transmitted to another person through contaminated food or water. When causing disease, amoebas must be capable of migrating from inside the intestine into the intestinal wall, or of surviving in the bloodstream while being carried into the liver or in rare cases even into other organs. There is every indication that, once they have moved out of the intestinal tract, they are no longer able to form cysts. And even if they could, the cysts would certainly never be able to exit the organs. So the amoebas can no longer be transmitted, and the capabilities of amoebas required to leave the intestinal duct and cause disease should have been lost in evolution long ago.

**Figure:** Metabolically active, motile amoeba (trophozoite, upper right) and the dormant, transmissible form (cyst, lower left) of *Entamoeba histolytica* shown under the microscope (Heidenhain’s stain).
Dyspepsia

**DIGESTIVE ENZYMES OF AMOEBA CAUSE DISEASE**

Amoebas (*Entamoeba histolytica*) possess an arsenal of digestive enzymes, including so-called peptidases or proteases. These are enzymes that cleave other proteins and so are able to digest them. A series of studies have shown that these enzymes not only digest, but also participate in the pathogenic activities of the amoebas, e.g. in the formation of hepatic abscesses in our amoebiasis mouse model. We showed this effect for three of the 35 total amoeba peptidases. When amoebas selected not to form hepatic abscesses were genetically altered so that they produced these three peptidases in larger quantities, they again caused abscesses.

Matthiesen J. et al., mBio 2013, 26(4(2))

Jenny Matthiesen, Ann-Katrein Bär, Anne-Kathrin Bartels, Dennis Marien, Susann Ofori, Laura Biller, Egbert Tannich, Hanna Lotter, Iris Bruchhaus, and external cooperation partners (see publication)

**Figure:** Digestive enzymes called peptidases are located on the surface of amoebas. Three individual amoebas are shown; peptidases EhCP-A1, -A2, and -A5, respectively, (green) and nucleus of the amoeba (blue) (Photography: Iris Bruchhaus).
That it is the aggressive properties of amoebas (Entamoeba histolytica) which cause intestinal ulcers and abscesses in organs, has always been assumed and is reflected by the name “histolytica” — histos Greek for tissue and lysis for dissolution. It was therefore a surprise that mice in which certain immune cells (monocytes and macrophages) were knocked-down did not develop larger hepatic abscesses, but considerably smaller ones instead. Also responsible for tissue destruction in amoeba infections of mice was tumour necrosis factor (TNF), a messenger substance in the immune system that, on the other hand, appears to be very helpful in the defence against tuberculosis.
Men suffer amoebic liver abscesses four times more frequently than women. This is also the case for the mice we use as models for human disease. Radical removal of the gonads of male mice makes them partially resistant to amoebas, and injections of testosterone make female mice more susceptible. Interferon (IFN\(\gamma\)) strengthens resistance to amoebas, and immune cells producing IFN\(\gamma\) – the naturally-occurring killer cells – of female mice produced more IFN\(\gamma\) than those of their male counterparts.

Lotter H. et al, PLoS One 2013, 8:e55694
Hanna Lotter, Elena Helk, Hannah Bernin, Egbert Tannich, Thomas Jacobs, and external cooperation partners (see publication)

Figure: Using magnetic resonance tomography (MRT), one can image amoebic liver abscesses (marked by a dotted red line) also in mice. If female animals are administered testosterone, the abscesses become larger (Illustration: Thomas Ernst and Hanna Lotter).
It does not happen often, but it happens. You can become infected with leishmania along the Mediterranean coastline, primarily with the dangerous species named *Leishmania infantum*, which attacks internal organs such as the liver and the spleen. In Europe, *L. infantum* is transmitted to humans mostly from infected dogs by tiny sandflies, which breed in dry thickets and rodent burrows.

**Figure:** Camping ground at the Mediterranean coast next to a biotope for sandflies, which can transmit leishmaniasis.
For many decades, compounds containing antimony have been the most important drugs to treat leishmaniasis. Antimony is related to arsenic. Resistance to antimony-based compounds was first observed in the 1980s and now complicates up to 70 per cent of the leishmaniasis cases in northern India, often with fatal consequences. The causes of this resistance appear to be diverse and are largely unknown. We have identified a protein that is partly responsible for antimony resistance (ARM58). It channels the harmful antimony out of the parasite and apparently carries out important decontamination functions for other harmful substances as well, since loss of the gene for the parasite is fatal. The protein is found only in leishmanias so that there is hope of reversing the drug resistance using special inhibitors of ARM58 without harming patients, who do not have ARM58.

Carola Schäfer, Paloma Tejera Nevado, Dorothea Zander and Joachim Clos

Figure: Distribution of the detoxification protein ARM58 (magenta) inside a leishmania cell (nucleus in blue) (Photography: Carola Schäfer).
Just prior to this report going to press it happened again, an Ebola outbreak. It occurred surprisingly far to the west this time, in Guinea, and is caused by a new viral strain of Ebola-Zaire (EBO-Z). With a fatality rate of 70-80 per cent, it is just as deadly as the strains known from central Africa. Virologists of the Institute together with European colleagues are on site to carry out rapid and reliable diagnostics.

VIRAL HAEMORRHAGIC FEVERS
A 41-year-old woman from the Netherlands became ill with fever four days after returning from holidays in east Africa. The illness was initially diagnosed as malaria. Full organ failure developed within a few days accompanied by generalised haemorrhages, and despite the most modern intensive care, the patient died of cerebral oedema. Two weeks prior to the illness she had visited what is known as the Python Cave in the Maramagambo Forest of Uganda, home to large colonies of bats. We found that she was infected with the Marburg virus. The Marburg virus is a close relative of the Ebola virus and causes a similarly fatal disease. Its natural host animals are fruit bats. The patient, who showed no skin injuries, was presumably infected by inhaling dust of bat excrements. African bats can carry many viruses. It is therefore generally advisable to avoid their contact.

van Paassen J. et al., Lancet Infect Dis 2012, 12:635-42

Jonas Schmidt-Chanasit, Stefan Schilling, Stefan Ölschläger, Toni Rieger, Petra Emmerich, Christel Schmetz, Stephan Günther and cooperation partners (see publication)

Figure: Electron microscopy: Marburg virus from the patient’s blood.
Presumably more than a thousand people in Nigeria die from Lassa fever each year. There had been no laboratories there for diagnosing the infection, and disease symptoms initially cannot be separated from those of many other tropical diseases. As a result, patients with Lassa fever were usually not recognised as such and were neither placed in isolation wards nor treated properly. In the worst case, they transmitted the virus to hospital staff and other patients. In 2008 we built, together with our Nigerian partners, the first hospital laboratory in Nigeria for diagnosing Lassa fever. We installed all necessary devices on site and trained local personnel in modern diagnostic techniques. The reagents are being shipped to Nigeria regularly. This resulted in about 2000 suspected cases that have annually been tested since 2008, of which ten per cent on average were positive. These cases are immediately moved to an isolation ward. Many patients come to admission only after the onset of the disease so that there are merely hours or few days left to prevent a fatal outcome – one reason for the high fatality rate of up to 30 per cent. Our next objective is to reduce the mortality.


Meike Hass, Martin Gabriel, Stephan Olschläger, Beate Becker-Zuaja, Stephan Günther and external cooperation partners (see publication)

Figure: Nigerian virologist in the laboratory of the Irrua Specialist Teaching Hospital preparing patient specimens for Lassa virus examination by the polymerase chain reaction (PCR) (Photography: Stephan Günther).
Worms can dampen the immune response in humans. For that reason, mild infections with swine whipworms (*Trichuris suis*), which are temporarily residing in the intestine of humans, are currently being investigated for their therapeutic efficacy against autoimmune disorders. Clinical observations suggest, however, that only a chronic infection, also called “infestation”, with worms suppresses immune reactions of the human host. In persons who have been exposed to worms for the first time, an acute worm infection may trigger allergic reactions instead. This applies primarily to worms that, at least during their larval stages, migrate through human tissues, which does not include the whipworm. However, whip worms certainly trigger a local immune response in the intestine – which is meant to be the therapeutic principle – and it is this reaction that in acute, first-time infections might as well be allergic and not immunosuppressive.

Figure: Sinistral facial oedema indicating a generalized allergic reaction of a European patient infected with worms for the first time, in this case with schistosomiasis (*Schistosoma haematobium*).
We are characterising substances that intestinal worms use to dampen the immune response of their hosts. In a three-dimensional culture of human intestinal cells, we studied proteins that are released by threadworms (*Strongyloides ratti*) in the intestinal tract. We found that several of them trigger the production of messenger molecules like interleukin (IL)-10 and IL-33, which may contribute to suppressing inflammatory immune responses in the intestine. We are hopeful that medications may be developed some day from these kinds of worm products to counteract Crohn’s disease and other auto-inflammatory bowel disorders.

Younis A.E. et al., *Microbes Infect.* 2012, 14:279-89

Abuelhassan Elshazly Younis, Hans Soblik, Frank Geisinger, Silke van Hooorn, Klaus Erttmann, Norbert Brattig and external cooperation partners (see publication)

*Figure:* Section of a three-dimensional intestinal cell culture. The nuclei of cells show in dark blue (Photography: Maren Jannasch).
To avoid their expulsion, parasitic worms suppress our immune system. As a result, they can also attenuate the immune response to vaccinations. Mice carrying chronic worm infections (*Litomosoides sigmodontis*) but not transient ones (*Strongyloides ratti*) have been found to poorly respond to a single vaccination against the liver stage of malaria parasites. Compared to healthy mice, they produced fewer immune cells able to destroy malaria-infected liver cells. In contrast, a combined vaccination applying the vaccine first in attenuated bacteria and subsequently as a purified protein was equally effective in both groups. In tropical countries where worms and malaria infections occur simultaneously, vaccination campaigns should take this into account.


Julia Kolbaum, Susanne Tartz, Wiebke Harrmann, Andreas Nagel, Volker Heusler, Thomas Jacobs, Minka Breloer, and cooperation partners (see publication)

Figure: Worm-infected mice respond to a single vaccination against malaria with fewer specific immune cells (CD8+ T-cells) that produce interferon-g (IFN-g) and tumor-necrosis factor (TNF). Killing of infected cells is reduced. Only a combined vaccination causes a sufficiently strong response in worm-infected mice (Illustration: Minka Breloer).
Imputation: Virtual Mutations

The same mutations (genetic variants) may occur in a number of individuals, “linked” to each other, if they are located near one another on the same chromosome and have not been separated by the routine mixing between our chromosome pairs – we have two sets of chromosomes – in the generation of egg and sperm cells. The closer to one another two mutations are located and the fewer generations have ensued since their random formation, the lower the probability, as a rule, that they have been separated from one another. As a result, the chromosomes in a population consist of a chain of blocks of different lengths which contain mutations that belong together, referred to as linkage groups. The more recent a mutation has occurred, the larger is its linkage group – which in the case of a new (“de novo”) mutation is the entire chromosome. If the genomes of many individuals in a given population have been sequenced, one can determine the linkage groups in this population quite reliably, and, for individuals for whom the genome sequence is unknown, the linkage group around any mutation can be deduced, allowing the other mutations in the vicinity to be “imputed”.

**Figure:** Determination of mutations in Ghanaians by chemical analysis (above) and imputation of additional mutations from linkage groups (below), deduced from the mutations known for 278 members of the Nigerian Yoruba tribe whose genomes have been sequenced in the “1000 Genome Project” exemplary for African populations (Illustration: Thorsten Thye).

HUMAN GENOME RESEARCH
We determined almost a million mutations in each of 1,400 children affected by severe malaria and 800 unaffected children, and then deduced an additional roughly five million mutations by imputation (see p.67). Besides the expected unequal distribution of the sickle-cell trait and blood group O, significant differences between affected and healthy children were newly identified in two regions of the genome and these were confirmed in 3,500 additional children. One of them was located in a large intron of the ATP2B4 gene, i.e. in a DNA sequence lying between two parts of the gene. ATP2B4 codes for a calcium pump that lies in the wall of, among others, red blood cells and influences the calcium concentration inside the cells. The second region is located about 6,000 base pairs in front of the MARVELD3 gene. MARVELD3 codes for a protein that seals off spaces between cells lining our blood vessels. One can well imagine that the calcium concentration of the host cells of malaria parasites as well as the seals in our vessel walls could influence the course of malaria. What is not clear, however, is how mutations can have an effect if they are located between two parts of a gene or relatively far from a gene. It is conceivable indeed therefore that the mutations discovered affect as yet unknown regulatory functions (see p.73).

Timmann et al., Nature 2012, 489:443-446

Christian Timmann, Thorsten Thye, Jennifer Evans, Jürgen May, Christa Ehmen, Jürgen Sievertsen, Birgit Muntau, Gerd Ruge, Wühke Loag, Michael Brendel, Kathrin Schulte, Christian G. Meyer, Rolf Horstmann and cooperation partners (see publication)

Figure: Paediatric ward at Komfo Anokye Teaching Hospital in Kumasi, where children with severe malaria were included in our study (Photography: Mika Väisänen).
Using imputation (see p.67), we have found an additional region in the human genome in which a mutation is located that protects against tuberculosis (TB). Unfortunately, the mutation is located quite distant from any known genes, so that we cannot deduce how it might influence protection against TB and how the information can be used to develop means for prophylaxis or treatment. A noteworthy aspect of the study is that it was the first time that twelve research groups from seven countries participated and mounted a total sample of 8,821 cases and 13,859 control persons. These kinds of cooperations are likely to be the model of the future.

Thorstén Thyre, Ellis Owusu-Dabo, Christa Ehmen, Birgit Muntau, Gerd Ruge, Jürgen Sievertsen, Rolf Horstmann, Christian Meyer and external cooperation partners (see publication)

Figure: Participating institutions:
BNITM, Germany; University of Oxford, Nuffield Dept. of Medicine, UK; Leiden University Medical Center, Dept. of Immunohematology and Blood Transfusion, Netherlands; University of Cambridge, Dept. of Medicine, UK; Medical Research Council Unit, Banjul, Gambia; Samara Oblast Tuberculosis Dispensary, Samara, Russia; Kumasi Centre for Collaborative Research, Kumasi, Ghana; Universitas Padjadjaran, Bandung, Indonesia; Ghana Health Service, Accra, Ghana; University of Ghana, School of Public Health, Legon, Ghana.
According to the initial sequencing completed in 2000, only two to three per cent of our genome contain identifiable genes and thus are considered as functionally active. We have compared the entire genomes of several thousand patients and healthy controls in our search for mechanisms that make many people resistant to tuberculosis and life threatening malaria, and have discovered statistically significant differences (see pp.69-71). These kinds of comparisons have meanwhile been performed in more than 1300 instances for many diseases. In total, 88 per cent of all significant differences found between patients and healthy persons were found located in areas of the human genome to which no specific function can be attributed at present.

In the past years, laborious methods have been developed by the international Encyclopedia of DNA Elements (ENCODE) consortium to unravel as yet unknown genetic regulatory processes. Several of the complex interactions between RNA molecules that do not code for proteins, genomic DNA and regulatory proteins have already been identified. Apparently, every gene is controlled by numerous regulatory events, which determine at what point in time during development (embryonic stage, foetal stage, etc.) the gene is read, “expressed” as a protein, in which tissue, in what state of activation, how this is coordinated with other genes and so on. Minor variations in this highly complex genetic regulation appear to be of critical importance for the development of most common diseases as for susceptibility and resistance to infections.

Figure from: ENCODE Project Consortium. An integrated encyclopedia of DNA elements in the human genome. Nature 2012, 489:57-74
To further increase the capability in resource-poor countries to independently conduct internationally competitive research, we support the development of scientific mentors. Epidemiologists from the Infectious Diseases Epidemiology group at BNITM have initiated an African Programme for Advanced Research Epidemiology Training (APARET), supported by the EU (www.aparet.org). APARET has been developed in cooperation with the African Field Epidemiology Network (AFENET, www.afenet.net) and eight African universities, the Swiss Tropical and Public Health Institute (Swiss TPH), the World Health Organisation (WHO), and the US Centers for Disease Control and Prevention (CDC). Scientists holding mid-level academic positions apply to the programme, submitting drafts of their own research projects. Each of 24 selected scientists works out and implements an epidemiological research project, supported by an African supervisor and a European mentor. Furthermore each fellow applies for third-party funding for future epidemiological research projects.

First successes have been achieved: An APARET Fellow from Burkina Faso, for example, has received additional third-party funding to study the effectiveness of a newly introduced rotavirus vaccine and whether escape mutants of the virus occur and threaten the success of the programme. Other projects will investigate drug-resistant bacteria, the long-term effectiveness of mosquito nets, and the frequency and social determinants of teenage pregnancies.


Lisa Reigl, Josephine Hill, Ralf Krumkamp, Thalea Tamminga, Jurgen May, Norbert Schwarz, for the Coordinator (BNITM), Elizeus Rutebemberwa and Sheba Gitta for the Programme Manager (AFENET)

Information about all APARET partner institutes and an individual profile of each APARET fellow can be found on http://www.aparet.org

Figure: African scientists discussing research designs at a training course on science management in Kampala, Uganda.
The Kumasi Centre for Collaborative Research (KCCR) was established in 1997 as a joint venture of the Ministry of Health (MoH) of the Republic of Ghana, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, and the Bernhard Nocht Institute for Tropical Medicine (BNITM). The centre serves as a platform for health research of overseas partners and their Ghanaian counterparts. KCCR continues to gain attention in the research agenda of the Ghanaian MoH and as a model for biomedical research at KNUST. In 2011, it was adjudged as the Centre of Excellence for Applied Biomedical Research under the auspices of the African Network for Drug Discovery and Diagnostics (ANDI/WHO/TDR).

Laboratory capacity at KCCR has been boosted by the acquisition of a biosafety level three (BSL3) laboratory, a quantitative PCR device (CFX96) and bacterial cultures of human and environmental samples.

KCCR presently hosts and supports a number of projects funded by agencies including the European Commission, Volkswagen Foundation, German Research Council (DFG), Malaria Vaccine Initiative (MVI), German Ministry of Education and Research and the European Mosquito Research Association:

Projects on filariasis refine the antibiotic treatment targeting symbiotic bacteria in filarial worms to alleviate the often underestimated suffering from elephantiasis and to tackle drug resistance in onchocerciasis.

Long-term tuberculosis research currently concentrates on typing mycobacterial strains for antibiotic resistance. Smaller studies address bovine tuberculosis and brucellosis amongst slaughterhouse workers.

A Buruli ulcer project has introduced molecular diagnostics, resulting in the nomination of KCCR as a reference centre for Buruli ulcer. At present the project tries to identify vaccine candidates.

KCCR is partnering a phase 3 study of a malaria vaccine (RTS,S), which started in 2006 and showed an initial protective efficacy of up to 58% against childhood malaria, which, however, seems to wane rapidly.

Clinical research mainly with partners from Komfo Anokye Teaching Hospital (KATH) include a study on the impact of infectious diseases on child development (CDS) and the improvement of medical care for HIV and tuberculosis (ESTHER), funded by the EU.

KCCR participates in a „Typhoid in sub-Saharan Africa Project“ (TSAP) by the International Vaccine Initiative (IVI) to quantify the potential effect of typhoid vaccination, embedded in a long-term program on bacterial and viral infections as neglected causes of „fever without source“.

Four KCCR staff members received training in bioinformatics. Eight Master’s and four PhD students are currently being trained, including series of workshops on cell and molecular biology (PCR technology). Eight scientists from AngloGold Ashanti, Ghana’s largest gold mining company, have been trained in molecular entomology including the detection of insecticide resistance, malaria vector speciation, biological databases etc. Addressing regional health professionals, KCCR has introduced a one-week course in infectious diseases modeled after that of BNITM.

In April 2013, BNITM introduced at KCCR a Research Group addressing epidemiology and intervention, at present focused on non-communicable disease (NCD) in the low resource setting. The group currently participates in a multicentre project on environmental risk factors for obesity and type 2 diabetes mellitus (T2D) among a migrant Ghanaian population in Europe and counterparts in rural and urban Ghana (RODAM). The project includes scientists from Accra, Amsterdam, Berlin, Potsdam and London and is funded by the EU (FP7).

Ellis Owusu-Dabo, Scientific Director, KCCR
Courses
The objective of the Diploma Course on Tropical Medicine is to prepare physicians for professional missions in tropical and subtropical countries and to enable them to preventively care for visitors of warm climates and to diagnose and to treat tropical diseases.

The central topics of the Diploma Course are human diseases characteristic for warm climates. Teaching focuses on the pathogenesis, diagnosis, clinical presentation, treatment, epidemiology and prophylaxis of parasitological, bacterial, viral and non-communicable tropical diseases. At the same time, the biology, epidemiology, as well as measures to control infectious agents, vectors and reservoirs are addressed. Further topics include the characteristics of the various clinical disciplines in tropical environments, problems of health care in poor countries and structures and performance of medical developmental cooperation and disaster missions.

The curriculum is divided into twelve sections of one week each. Differential diagnosis is the major guideline for the curriculum. Taxonomy is an additional criterion in order to facilitate systematic learning. Entomology is considered in its relation to the etiology and transmission of disease and therefore follows clinical classifications. Malaria, tuberculosis and HIV/AIDS, because of their outstanding relevance, are regarded as separate topics.

Scientific coordinator:
Prof. Christian G. Meyer
Week 1: ■ Introduction and Basics: bacteriology, parasitology, entomology, incl. immunology, exercises

Week 2: ■ General Infections – Malaria
  incl. entomology, general epidemiology, laboratory diagnostics, exercises

Week 3: ■ General Infections – Viral and Bacterial Infections
  incl. entomology, diagnostics, exercises

Week 4: ■ General Infections – Protozoan Infections, Systemic Mycoses
  through viruses, bacteria, and protozoa, incl. microscope exercises

Week 5: ■ Intestinal Infections
  microscope exercises

Week 6: ■ Worm Diseases
  included: microscope exercises

Week 7: ■ Dermatological and Veneral Diseases, Ophthalmology
  in particular, neurology, surgery, radiology, psychiatry, venous animals, paediatrics, malnutrition, genetically determined tropical diseases

Week 10: ■ Public Health
  in particular planning, finance, organisation and implementation, hygiene programmes, medical development cooperation

Week 11: ■ Epidemiology and Disease Control
  travel medicine, maternal care and childhood vaccination programmes, reproductive medicine, hospital hygiene, disaster management, essential drugs

Week 12: ■ Differential Diagnoses and Review

Week 13: ■ Review and Examinations

Institute Lecturers / External Lecturers

LECTURERS OF THE DIPLOMA COURSE ON TROPICAL MEDICINE

INSTITUTE FACULTY
  Prof. Dr. Norbert Bretting; Prof. Dr. Minika Breitner; Prof. Dr. Iris Bruchhausen; Prof. Dr. Gerold Burchhardt; Prof. Dr. Joachim Claus; Dr. Jakub Cramer; Dr. Torsten Feldt; Prof. Dr. Bernhard Fleischhauer; Prof. Dr. Rolf Gromm; Prof. Dr. Christoph Günthner; Prof. Dr. Horst Hirstmanner; Dr. Christian Keller; Prof. Dr. Jürgen Marx; Prof. Dr. Christian G. Meyer; Dr. Sven Poppe; Prof. Dr. Paul Racz; Prof. Dr. Jonas Schmidt-Charanta; Prof. Dr. Herbert Schmitz; Dr. Michael Schreiber; Prof. Dr. Egbert Tannich; Dr. Klara Tenner-Racz; Dr. Christian Timmann

GUEST FACULTY
  PD Dr. Karolinska Arcadia Ventures Augusto-Heide-Klinikum, Berlin; Dr. Mary Ayres Vogel Augenarzt, Lübeck; Dr. Michael Bahrmuth Sympo- sium, Hamburg; Dr. Matthias Bonhebert Chirurgische Universitätsklinik, Hamburg; Dr. Thomas Brackstein Kinder- und Jugendmedizin, Berlin; Dr. Christoph Behmer Universitätsklinikum Ulm; Prof. Dr. Christian Dresen Institut für Virologie, Universitätsklinikum Bremen; Dr. Karl-Peter Faisseneke Taschenärztliche Untersuchungsstelle, Hamburg; Dr. Thomas Fenner Labor Dr. Fenner und Kollegen, Hamburg; Dr. Thomas Feldt Universitätsklinikum Danzig; Dr. Marcellus Fischer Bundeswehrklinikus, Hamburg; Hanna Fleischmann Missionsärztliches In- stitut, Würzburg; Antje Fuß Missionsärztliches Institut, Würzburg; Dr. dent. Roland Garwe Dónde Private University, Køen, Beulal Gá- ken Cop Anarca, Köln; Dr. Matthias Großes Christliches Krankenhaus Gütersloch, Gütersloch; Prof. Dr. Wolfgang Gräwe Universitäts- klinikum (AGU), Würzburg; Dr. Hartmut Großl Max-Planck-Institut für Meteorologie, Hamburg; Dr. Gunar Günther Forschungszentrum Herzst. Bonn; Prof. Dr. Karl Meusburger Institut für Sozialbiologie, Bonn; Prof. Dr. Klaus Hoffmanns Zentrum für Psychiatrie, Heidelberg; Dr. Frank Hünig, Klinikum Düsseldorf, Düsseldorf; Dr. Helmut Jäger MD Hosico, Reisendes Zentrum am EN, Hamburg; Dr. Klaus Kästner C. Plato Wissenschaftsgesellschaft, Göttingen; Prof. Dr. Walther Klaut-Peters Augenarzt Klinik, München; Prof. Dr. Michael Kröbel Institut für Ernährungsmedizin, Gießen; Prof. Dr. Andreas Kröger Bundeswehrklinikus, Hamburg; Dr. Günther von Lauw Außen- tages Amt / Gesundheitsamt der DDR, Berlin; Prof. Dr. Christoph Lange Forschungszentrum Herzst. Bonn; Prof. Dr. Michael Landenbeck Universitätsklinik, Ulm; Dr. Heike Lippert Benediktinen Herm.; Prof. Dr. Thomas Lücker Klinikum der UBB, München, Prof. Dr. Ste- fan Leith Universitätshospital Hamburg-Eppendorf, Hamburg; Prof. Dr. Dieter Meckes Zentrum für Orthopädie, Frankfurt/Main; Dr. Carlos E. Medina de la Garza DDS, Monterrey, Mexico; Dr. Peter Meißner Klinik für Kinder- und Jugendmedizin, Universität Ulm; Dr. Andre- as Meyer Amt für Allgemeinmedizin, Hamburg, Dr. Hessing Wehm Thüringen Universitätshospital Klinik für OP, Jena; Prof. Dr. Matthias von Hahnen Medizinische Dienst der Luftwaffe AG, Leutershausen; Ludwig Heupel Amt für Mensch und Tierschutz, Dr. Erika Owens-Dahm KEC, Graz; Dr. Dr. Klaus Pischel Institut für Rechtmedizin, Hamburg; Prof. Dr. Ute Riecker Zentrum für Lungenforscher der Universitäten Hamburg, Bremen, Dr. Sabine Rößler-Tamms Forschungscenter Herzst. Bonn; Prof. Dr. Georg Rösler Universitätsklinik, Bremen; Dr. Johannes Schwäger Tropenforschung, Paul-Lederer-Krankenhaus, Tübingen; Dr. Salvatore Schmitt Sanitätssstelle der Bundeswehr, München; Dr. Stefan Schminke Universitätsklinikum Hamburg-Eppendorf; Prof. Dr. Herbert Schmitz Labor Dr. Fenner und Kollegen, Hamburg; Prof. Dr. Erich Schmiedehof Universitätsklinik für Neurologie, Hambur- g; Prof. Dr. Wolfram Siegert Tropenforschung Medizinische Universi- tätsklinik, Lübeck; Dr. Michael Meßbach C.A. Hofmann-Klinik, Dres- den; Prof. Dr. August Stich Missionsärztliche Klinik, Würzburg; Dr. Tankred Stöbe Ärzte ohne Grenzen, Berlin; Lars Bomm Jörn von Kiezen, Ulm; Prof. Dr. Hermann Vogel Rudolph, Hamburg; Dr. med. Klaus J. Wellinger Zentrum für Rehamedizin, Düsseldorf, Wolfram Wiesmüller Missionsärztliches Institut, Hamburg, Frankfurt; Dr. Dominik Weitzmann Universitätsklinikum Hamburg-Eppendorf, Hamburg; Dr. Urs Weigel Ustek, Schweiz

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The course provides basic knowledge and skills in tropical medicine and explicitly addresses the topics of public health and health care management. The courses of the years 2012 and 2013 were both held in February.

TARGET GROUPS:
Medical staff (nurses, technical assistants, midwives, health economists) preparing for professional assignments in warm-climate countries; in addition medical staff to acquire or deepen tropical medicine skills.

Course for medical support staff

MEDICINE IN THE TROPICS

Contents:
- Tropical infectious diseases: malaria, leprosy, tuberculosis, schistosomiasis and other helminth diseases, viral infections
- Insects as vectors
- Malnutrition
- Basic epidemiology
- General aspects: obstetrics, family planning, paediatrics, venereal diseases, dermatology, HIV/AIDS, travel medicine etc.
- Physical examination of patients, laboratory techniques, microscopy
- Socio-cultural comparison of health systems
- Intercultural competence
- Hygiene, drinking water
- Nursing practice in the tropics
- NGOs
- Information systems, literature and internet search
- Teamwork

Scientific coordinator:
Prof. Christian G. Meyer
Facts and Figures
### FUNDING

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Third-party funding has been received from the following organizations:

(public funding from DFG, federal, state, and EU sources; funding from foundations, private donors, and other research funding, as well as income from contracts, commercial collaborations, services rendered, and licensing fees)

- German Federal Foreign Office, Becton Dickinson GmbH, BioLegend GmbH, Hamburg State Office of Science and Research (BWF), German Academic Exchange Service (DAAD), German Academy of Natural Sciences Leopoldina / German Academy of Science (Deutsche Akademie der Naturforscher Leopoldina e.V. – Nationale Akademie der Wissenschaften), German Research Foundation (DFG), German Federal Ministry of Education and Research (BMBF), German Aerospace Center (DLR), European Federation of Immunological Societies (EFIS), Else Kröner Fresenius Foundation (EKFS), European Union (EU), Euroimmun AG, Foundation for National Institutes of Health (NIH), GeoSentinel Network, Gilead Sciences GmbH, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Helmholtz Centre for Infection Research (HZI/DZIF) GmbH, Instand e.V., International Vaccine Institute, Leibniz Association, International Union of Immunological Societies Education Committee (IUIS), Robert Koch Institute (RKI), Stiftung Hilft, The Rockefeller University, German Federal Environment Agency (UBA), University Medical Center Hamburg-Eppendorf (UKE), Universität Hamburg (UHH), Vereinigung der Freunde des Tropeninstituts e. V. (Friends of the Institute for Tropical Medicine), Volkswagen Foundation, Werner Otto Foundation, and Wiley-Blackwell.

### Performance indicator

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### Laboratory diagnostics

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*Lessons per semester week

**KCCR**

Kumasi Centre for Collaborative Research, a joint venture of the Ministry of Health, Republic of Ghana, Kwame Nkrumah University, Kumasi, Ghana, and BNITM

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<td>Education and training events (days)</td>
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<td>2</td>
</tr>
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</table>

### Laboratory diagnostics

<table>
<thead>
<tr>
<th>2012</th>
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<tbody>
<tr>
<td>Number of cases</td>
<td>24,108</td>
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<td>Number of tests</td>
<td>65,123</td>
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<td>Library</td>
<td>46,492</td>
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<td>Inventory</td>
<td>174</td>
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<tr>
<td>Journals</td>
<td>4,072</td>
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<td>Inter-library loan</td>
<td>2,394</td>
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<tr>
<td>KCCR</td>
<td>27</td>
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</tbody>
</table>

*Lessons per semester week

**KCCR**

Kumasi Centre for Collaborative Research, a joint venture of the Ministry of Health, Republic of Ghana, Kwame Nkrumah University, Kumasi, Ghana, and BNITM
Staff
B) SUPPORT STAFF

(*= end of employment during the reporting period)

Administration
Business Management
Udo Gawenda, Kaufmännischer Geschäftsführer

Financing
Herbert Groß, Leiter; Suzanne Creikh; Simone Gieß; Ditta Kiesbauer; Gisela Kitsch; Carsten Schade; Joana Volz; Christina Zwickert

Personnel
Heinrich Peters M.A., Leiter; Katja Bürger; Anja Günther; Ulrich Keiner; Jeanett Meurer (Ausbilder); Carsten Schaible

Purchasing and Operation
Thomas Strübel, Leiter; Manuela Baguleh; Werner Bormann; David Gissel; Sophie Gersow; Rita Günter; Rainer Haack; Michael Hecker; Katrin Himstedt; Rainer van Hoorn; Önder Kücük; Stefanie Meftah; Helmut Rott

Technical Service
Michael Jacobs, Leiter; Claus Ahrens; Peter Beutler; Rainer Fromm; Paul-Gerhardt Kämpfer; Rene Loose; Joachim Zietzschmann

Cleaning
Grace Assu-Buahoko; Sandy Chanmangos-Mohi; Maria Cullado; Serpl Demir; Monica Dison; Maria Fernando*; Fiona Gitt; Gavriel Girson; Petra Hartmann; Nina Holz; Gisela Kesch*; Birgit Moho-Filzger; Ayesha Ocran; Claudia Schober; Annette Schwarzbach; Cornelia Stallmann; Kader Seyel; Moral Teyan; Serpl Toure; Gülbahar Ulusen; Türkcan Ulusen; Sylvia Zuntz

C) SUPPORT STAFF KCCR, GHANA

(*= end of employment during the reporting period)

Management
Dr. Ella Owusu-Dabo (Scientific Director); Mrs. Ingrid Suchowersky (Head of Administration)

Administration
Hennetra Addai (Prim. Admin. Secretary); Cathy Adjei-Odame (Receptionist) until 10/2012; Jeffrey Aygraphics (Systems Operator); Francis Dronan (Sys. Accounting Assistant); Sabrina Kwarteng (Senior Accountant); Stephen A. Kwarteng (Logistics)*; Foster Bawumia (Junior Logicsian since 08/2013)

Transport
Samsu Dompoy (Supervisor); Gabriel Osum Adjeampong; Robert Adjeampong; Kennedy Adjeogye Dadu; Paul Martel Bokir; Philip Frempong; Emmanuel Lasie, Anthony Momoh; Joseph Teey; Seth Wirelu

Security
Dominic Adu-Asong (Head); Andrew Baka; Samuel Adua; Joshua Ayebeye; Francis Ayewura; Yaw Dadu; Felix Kruking; Thomas V. Zibde

Field / Cleaning
Helena F. K. Amaning (Caretaker); Eric Bah Morsa; Muriel Nana; Christel Muntam; Christina Nana; Komla Owusu; Comfort Tetteh; Ruth Boampong

Staff Committee

Works Council
Werner Bornmann; Veron; Moritz Aara; Beate Becker-Butt; Sabine Köhler; Otmar Küchle; Camilla Krue; Gisela Lenz; Kurt Möller; Birgit Riebe*; Dr. Toni Rieger; Dr. Norbert Schwarz; Ruth Sachse; Dorothea Zander

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Appendix

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and
LECTURES AND SEMINARS OF BNITM STAFF AT THE UNIVERSITY OF HAMBURG

Faculty of Medicine

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**Effective course: Tropical and Travel Medicine, 12 weeks**

*Egbert Tannich, Cord Berthold*

Introduction into tropical medicine / Basic knowledge on tropical medicine, seminar, 1 hour

Rolf Hartmann, Christian Timmann, Jürgen May

Introduction into molecular parasitology, 2 hours

Stephan Günther and co-workers

Introduction into immunology for medical students, lecture, 1 hour

Bernhard Fleischer, Hans-Willi Mittnacht, Friedrich Haag

Introduction into immunology, add-on studytrack molecular biology, seminar, 2 hours

Bernhard Fleischer and co-workers

Immunological literature, seminar, 1 hour

Bernhard Fleischer and co-workers

Immunological aspects of host-pathogen interactions in infectious diseases, 2 hours

Paul Raat, Klein, Teresa Raat

Cross-disciplinary subject immunology / infectious diseases, seminar

Bernhard Fleischer

Practical vaccinology and travel medicine, course, 2 hours

Johannes Krämer

**Faculty of Biology and Chemistry**

<table>
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</table>

**Molecular parasitology, lecture, 2 hours**

Egbert Tannich, Anna Bachmann, Joachim Clos, Monica Hagedorn, Stefanie Becker, Tobias Spielmann

**Molecular parasitology, practical course, 6 hours**

Egbert Tannich, Anna Bachmann, Joachim Clos, Monica Hagedorn, Stefanie Becker, Tobias Spielmann

**Molecular parasitology seminar, 2 hours**

Egbert Tannich, Anna Bachmann, Joachim Clos, Monica Hagedorn, Stefanie Becker, Tobias Spielmann

**Virological course for biochemists, practical course, 2 weeks**

Stephan Günther and co-workers

**Immunological course and literature seminar, block seminar, 4 hours, 6 weeks**

Thomas Jacobs, Minka Breloer, Bernhard Fleischer and Monika Bartl

**Immunological literature seminar, 1 hour**

Bernhard Fleischer and co-workers

**Cellular and molecular immunology, lecture, 2 hours**

Bernhard Fleischer, Minka Breloer, Thomas Jacobs

**Current problems in immunology, seminar, 1 hour**

Bernhard Fleischer and co-workers

**Elective course: Tropical and Travel Medicine**

For medical students at the University of Hamburg

*Egbert Tannich, Cord Berthold (clinical tropical medicine)*

This course provides students who show a special interest in tropical and travel medicine the opportunity to focus their course work. Therefore, this option has been offered for several years in cooperation with the University Medical Center for a maximum of six selected medical students. The subject of tropical and travel medicine is particularly suited for an interdisciplinary lesson because:

- it is not related to one organ, tropical diseases generally affect many organ systems;
- tropical medicine is a typical cross-disciplinary subject, which includes not only internal medicine training but also theoretical, diagnostic, surgical and microbiological aspects;
- it addresses not only aspects of curative medicine but also of public health.

The course runs over 12 weeks and takes place twice a year starting in October and January.

[www.uka.uni-hamburg.de/studierende](http://www.uka.uni-hamburg.de/studierende)
SEMINARS

Prof. Dr. Rolf Kortenmeyer
"Diseases of the liver and spleen" (Hannover, Germany)
"Einführung in die genetische Epidemiologie" (11.11.2012)

Dr. Michael Schumacher
"Mikrobiologische Grundlagen für die biomedizinischen Wissenschaften" (21.11.2012)

Prof. Dr. Ulrich Mohr
"Diseases of the liver and spleen" (Hannover, Germany)
"Randomized Controlled Trials (RCTs)" (12.11.2012)

CLINICS

Prof. John Fulop
"Hepatitis C" (Wien, Austria)
"Die Rolle der Vortherapie" (31.10.2012)

Prof. Dr. Mikola Zeuzem
"Pathogenesis of viral hepatitis" (31.10.2012)

Prof. Dr. Alexander Neumann
"Impact of hepatitis C treatment" (11.11.2012)

Prof. Dr. Ralf Bartenschlager
"Hepatitis C virus (HCV): infectivity, cell infection and replication" (12.11.2012)

Prof. Dr. Michael Schumacher
"Mikrobiologische Grundlagen für die biomedizinischen Wissenschaften" (13.11.2012)

Prof. Dr. Thomas Becker
"Infections: Hairy cell leukemia, Acute Myeloid Leukemia, Chronic Myeloid Leukemia, CML" (09.12.2012)

Prof. Dr. Peter Urban
"Chronic myeloid leukemia" (14.12.2012)

Prof. Dr. Carsten Fehm
"Cancer and virus infections" (18.12.2012)

Prof. Dr. Stefan Albrecht
"Development of antiviral drugs against hepatitis C virus" (03.01.2013)

Prof. Dr. Michael Schumacher
"Further improvements in the treatment of HCV infection" (04.01.2013)

Prof. Dr. Bernhard Feichtinger
"Future of antiviral treatment of hepatitis C" (05.01.2013)

Prof. Dr. Stefan Becker
"The role of the hepatitis C virus in the pathogenesis of human liver disease" (06.01.2013)

Prof. Dr. Thomas Becker
"Hairy cell leukemia and other rare hematopoietic tumors" (07.01.2013)

Prof. Dr. Carsten Fehm
"Cancer and virus infections" (08.01.2013)

Prof. Dr. Stefan Albrecht
"Development of antiviral drugs against hepatitis C virus" (09.01.2013)

Prof. Dr. Michael Schumacher
"Further improvements in the treatment of HCV infection" (10.01.2013)

Prof. Dr. Bernhard Feichtinger
"Future of antiviral treatment of hepatitis C" (11.01.2013)

Prof. Dr. Stefan Becker
"The role of the hepatitis C virus in the pathogenesis of human liver disease" (12.01.2013)

Prof. Dr. Carsten Fehm
"Cancer and virus infections" (13.01.2013)

Prof. Dr. Stefan Albrecht
"Development of antiviral drugs against hepatitis C virus" (14.01.2013)

Prof. Dr. Michael Schumacher
"Further improvements in the treatment of HCV infection" (15.01.2013)

Prof. Dr. Bernhard Feichtinger
"Future of antiviral treatment of hepatitis C" (16.01.2013)

Prof. Dr. Stefan Becker
"The role of the hepatitis C virus in the pathogenesis of human liver disease" (17.01.2013)

Prof. Dr. Carsten Fehm
"Cancer and virus infections" (18.01.2013)

Prof. Dr. Stefan Albrecht
"Development of antiviral drugs against hepatitis C virus" (19.01.2013)

Prof. Dr. Michael Schumacher
"Further improvements in the treatment of HCV infection" (20.01.2013)

Prof. Dr. Bernhard Feichtinger
"Future of antiviral treatment of hepatitis C" (21.01.2013)

Prof. Dr. Stefan Becker
"The role of the hepatitis C virus in the pathogenesis of human liver disease" (22.01.2013)

Prof. Dr. Carsten Fehm
"Cancer and virus infections" (23.01.2013)

Prof. Dr. Stefan Albrecht
"Development of antiviral drugs against hepatitis C virus" (24.01.2013)

Prof. Dr. Michael Schumacher
"Further improvements in the treatment of HCV infection" (25.01.2013)

Prof. Dr. Bernhard Feichtinger
"Future of antiviral treatment of hepatitis C" (26.01.2013)

Prof. Dr. Stefan Becker
"The role of the hepatitis C virus in the pathogenesis of human liver disease" (27.01.2013)

Prof. Dr. Carsten Fehm
"Cancer and virus infections" (28.01.2013)

Prof. Dr. Stefan Albrecht
"Development of antiviral drugs against hepatitis C virus" (29.01.2013)
In the "Genome Research Framework for Epidemics in Europe" (GENRE) consortium, which is coordinated by Ananyo Sarkar/Jha at the Pasteur Institute, Dr. Michael Schellenberg receives an allocation of 356,500 EUR from the European Commission to develop specific serological tests for the two symptomatics of the dengue virus.

In 2013, a public-private partnership between InHIT and altona Diagnostics Technologies GmbH receives 4.63 mil EUR in support over a four-year period from the European Regional Development Fund and 400,000 EUR in funding from the City of Hamburg. Standardized and reliable diagnostic tests for tropical and emerging infections will be developed, to later be marketed internationally.

On 30.06.17, in the annual short course "Medicine in the Tropics" (Melos in den Tropen), 24 nurses and other medical support personnel are being trained to work under resource-poor conditions in areas endemic for tropical diseases.

On 23.02.12, fifty-three participants of the 2nd round of the International Biology Olympiades attend scientific lectures and take a tour of the Visegrad Department and the new high-security BSL 4 laboratories.

On 01.03.12, Prof. Rolf Herrenmann signs a collaboration agreement with the "Fundsmedizinische Tropen Dr. Heinz Veitno Gotzsuch" in Hannover, Germany. The initial joint project will focus on the characterisation of Plasmodium vivax malaria variants in a dog trial on the prevention of relapses.

On 02.04. – 29.06.2012 the annual Diploma Course on Tropical Medicine is attended by 18 physicians and biologists from Germany and Austria.

On 03.04.2012 Dr. Horst-Michael Pelikan succeeds Dr. Kristina Wolff as State Secretary in the Hamburg State Ministry of Science and research, and ex officio Member and Chair of the BNIW Board of Trustees.

On 26.04.2012 Every year, it is the enormous interest continues unabated. A total of 55 students visit the institute during the nationwide "Girls and Boys’ Day". Dedicated BNIW research groups give them the opportunity to go to know a bit about what it is like being a scientist. A quote: “I’d love to stay longer”.

On 14.06.2012 the "Association of Friends of the Hamburg Tropical Institute" (Vereinigung der Freunde des Senckenberg Institut Hamburg, SVIH) awards two outstanding doctoral students of the institute with its annual doctoral Award and 1,000 EUR Prize. This year the awards go to biologist Dr. Georg Adler (immunology, Jacob group) for animal experiments on the immune response to malaria, and physician Dr. Johannes Fischer-Hein (Baruch group) for studies on the cardiac function in malaria. Following the awards ceremony during this year's Annual General Assembly, members of the association attend the BNIW staff summer party. Ongoing rain cannot dampen the atmosphere.

On 16.06.2012 Marcus Guder from the Virusology Department assembles a team of 25 members of the institute for the annual Hot-Hardwork Run. The "Children Helping Children" (Kinder Hilfe Kindern) charity receives part of the participants’ registration fees, amounting to 160 EUR through the BNIW Group.

On 27.06.2012 The German Centre for Infection Research (DZIF) is founded. Generally heavily funded by the German Federal Ministry of Education and Research (BMBF), DZIF comprises seven member sites, throughout Germany. BNIW is coordinating the Hamburg-Lübeck-Kiel site, which includes as partners Hamburg University, the University Medical Center Hamburg-Eppendorf, Lübeck University as well as, besides BNIW, the Leibniz Institutes Heinrich Petre Institute and Research Center Borstel. The funding amounts incrementally and will amount to three million EUR annually for the site by 2015.

On 22.06.2012 WHO State Secretary Dr. Horst-Michael Pelikan on the occasion of his assuming office, including presentations in the historical lecture hall and a tour of the institute.

On 01.08.2012 In conjunction with the German Academy of Sciences Leopoldina and the Network of African Science Academies (NASAA), Prof. Bernhard Pfeiffer organizes a conference on the pressing global issue of neglected tropical diseases (NTD). The event is supported by BNIW and takes place in the institute’s historic lecture hall. Among the participants are representatives of the World Health Organization, the Global Fund, the European Academy of Sciences, and the pharmaceutical industry.

On 23.11.2012 Dr. Horst-Michael Pelikan, Prof. Rolf Herrenmann, Dr. Jonas Schmidt-Chanasit, and Prof. Edgar Tannich hold a panel discussion entitled “Impacted epidemics – a New Challenge?” bout the risk of epidemics of tropical infectious diseases in Germany, presented at the Kölner Forum, Krefeld. With 150 guests, the event is well-attended on a Friday evening.

On 23.12.2012 For the third time in a row, the Virusology Department is organized BNIW Collaborating Center for Avian and Haemorrhagic Fever Reference and Research. The World Health Organisation thereby once again acknowledges the exceptional competence of the department for research on viruses transmitted by mosquitoes and viruses causing life-threatening haemorrhagic fevers.

On 01.01.2013 Prof. Edgar Tannich receives a grant of 476,500 EUR from the German Centre for Infection Research (DZIF) for establishing a M3 professorship as well as a research group for studies on mosquitoes and other arthropods in Germany and on pathogens transmitted by them.

On 01.01.2013 Prof. Jurgen May coordinates the network of African Partner sites of the German Centre for Infection Research (DZIF) in Lamba/ntu (Gabon), N’Gor (Senegal), and Karama (Cameroon). In addition, he is leading projects on mathematical analysis and modelling of clinical and epidemiological data, as well as studies on malaria co-infections in Africa, with a total budget of 475,000 EUR for 2015.

On 24.01. – 25.01.2013 "Clinical International Health - The Northern Face" is the title of an international DZIF symposium jointly structured by the University Hospital Hamburg-Eppendorf (UKE) and UNHIT. Representatives from all pertinent European institutions discuss timely structures of clinical capacity for tropical and travel medicine in industrialized countries of temperate climate.

In 2012, the "Genome Research Framework for Epidemics in Europe" (GENRE) consortium, which is coordinated by Ananyo Sarkar/Jha at the Pasteur Institute, Dr. Michael Schellenberg receives an allocation of 356,500 EUR from the European Commission to develop specific serological tests for the two symptomatics of the dengue virus.

In 2013, a public-private partnership between InHIT and altona Diagnostics Technologies GmbH receives 4.63 mil EUR in support over a four-year period from the European Regional Development Fund and 400,000 EUR in funding from the City of Hamburg. Standardized and reliable diagnostic tests for tropical and emerging infections will be developed, to later be marketed internationally.

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1.8.13 New groups Spielmann & Schmidt-Canasit
9.7.13 Larva of dog-skin worm

The Veidige Department invites journalists to a final photo and video shooting inside the new high-security laboratory, two virologists demonstrate the protective suit they wear when they work with viruses of the highest biological risk group (BSL-4).

20.01.- 15.02.2013 The annual short course “Medicine in the Tropics” (Medizin in den Tropen) for medical support staff is attended by 25 participants.

31.01.- 01.02.2013 The fourth symposium jointly organized by the institutes of the Leibniz Center (LU) addresses “Infection Epidemiology.” The historic lecture hall of BMBF is once again completely occupied by 140 participants. Renowned international scientists discuss the 2011 BSE outbreak in northern Germany as well as global issues including e.g. drug-resistant tuberculosis and fruit bats as a source for viral infections in humans.

01.02.2013 Dr. Ellis Oweza-Owu, who has worked successfully on projects in the Institute in Ghana and presently is the “Scientist’s Director of KEEC” is renowned head of a BMWF research group addressing noncommunicable diseases in regions endemic for tropical infections.

14.03.2013 Surgeon-General Joachim Holtz, MD, Chief Physician of the German Armed Forces Hospital in Hamburg, pays an inaugural visit to Prof. Holtz Farmschad. The 19.03.2013 Signing of an extension of the collaboration agreement with the University of Antananarivo in Madagascar, which has been in place since 2010, and inauguration of a health station in the highlands of Madagascar.

02.04.- 26.06.2013 The annual diploma course in Tropical Medicine again brings together 49 physicians who want to specialize in global health to go abroad with international organizations or take on special responsibilities in their institutions in Germany or Austria.

25.04.2013 This year, 38 children visit the Institute on the occasion of the “Girls’ and Boys’ Day”, enjoying a colourful programme as each year. A quote: “The mosquito staff was cool!”

12.06.2013 Biological Dr. Marleen Janvs (Institute Immunology lab group) and physician Dr. Benjamin Fast (Institute research group) are the two outstanding doctoral students of the institute who receive the Dr. Dorothea Student Prize of the Association of Friends of the Tropical Institute (ViF) this year. Dr. Jansen investigated fatal tularemia in a mouse model, and Dr. Furst studied the human immune response to cytomegalovirus infection as a function of age and gender. Again, the prizes are awarded at the annual ViF General Assembly.

26.06.2013 Dr. Henrik Süddeck from the Tropical Medicine Section of the German Armed Forces and Prof. Bernhard Flesch receive a high-ranking Chinese delegation at the Institute as part of a Sino-German symposium.

01.07.2013 Dr. Nardett Schwan (Way group) receives a grant of 400 €/EUR from the German Federal Foreign Office for an international training programme entitled “GABAHIT”, designed to prepare scientists and health officials in developing countries for catastrophes like epidemics – including those provoked by criminal acts.

07.07.2013 Scientists of the Institute and the Community Action Alliance for Mosquito Control (OARIS) for the first time detect larvae of the canine roundworm Diphyllobothrium repens in mosquitoes in Germany. Dogs are the reservoirs for the worms, but humans may be infected as well. By monitoring mosquitoes in Germany, scientists may provide timely warnings of outbreaks.

16.09.2013 Prof. Gerd-Direr Burnard, head of the Tropical Medicine Section of the University Medical Center Hamburg-Eppendorf (UKE) and head of Clinical Sections of the Institute, received at a reception. Prof. Burnard’s eminent sites are appreciated in clinical tropical medicine in Germany and as the essential person link between UKE and BMWF.

25.09.2013 The “Hambrong on the Way in Africa” action day attracts about 100 guests. The “Friends of the tropical institute” have initiated this event, sponsored by Stage Entertainment and supported by the local newspaper Hamburger Abendblatt. As part of a visit to the musical event “The Lion King”, a mobile laboratory, “Cyklar”, to be financed by ticket sales awaits visitors along with experts and journalists and later a tour of the Institute.

01.10.2013 Sociologist Dr. Birgit Reime – the first to hold the position of an institute professor for women re-entering professorships after parental leave – is appointed to a tenure-track professorship following two years’ work at BMWF. Microbiologist Dr. Emi Boye will be her successor in the programme, working on the immune response to intestinal infections.

10.10.2013 The institute introduces a new logo. The acronym is included in large letters to assign the logo to the Institute in case the image is greatly reduced in size (PIN is extended to BMBF to avoid confusion with the secret service “Bureau of National Investigation” (BNI), e.g. in Ghana.

15.10.2013 An assessment shows that several specimens of the tiger mosquito Aedes albopictus have this year been caught as part of a mosquito monitoring project conducted by BMBF, the Community Action Alliance for Mosquito Control (OARIS) and several collaborating partners. The mosquito transmits dengue fever and has now repeatedly been found along motorways in southern Germany.

02.11.2013 Staff from all parts of the Institute oppose the Institute’s presentation for the 5th Night of Science (Nacht des Wissens). The Institute records more than 1,500 visitors, nearly 100 more than last time. From the guestbook: “nice parade – thank you,” “slightly – wish all the best,” and “I’m glad you are here.”

21.11.2013 BMWF, the Federal University of Rio de Janeiro, and the BIOS association targeting teenage street groups in Rio, join forces to protect against dengue infections with emphasis on the 2014 Olympics in Brazil. Street workers are being trained to catch mosquitoes, advise control measures and to inform and educate the population, visitors, and, later on, athletes. The scientific focus is on monitoring mosquito densities and the viruses they carry. The project is part of a biosafety programme of the German Foreign Office.

14.03.2013 Prof. Horstmann welcomes Dr. Hoitz
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Durch Spenden an den Freundeskreis erhielten von da an die experimentelle Forschung sowie Expeditionen ins Ausland wichtige finanzielle Impulse.

Bis heute engagiert sich der gemeinnützige Verein für die Arbeit des Instituts, unterstützt ausgewählte Forschungsprojekte und fördert den wissenschaftlichen Nachwuchs. So trägt der Förderverein zum Gelingen wichtiger Projekte hier und in den tropischen Ländern bei. Die Vereinigung der Freunde fördert das Tropeninstitut z.B. durch

- Jährliche Vergabe eines Doktorandenpreises
- Stipendien für junge Wissenschaftler
- Ausrichtung wissenschaftlicher Kolloquien