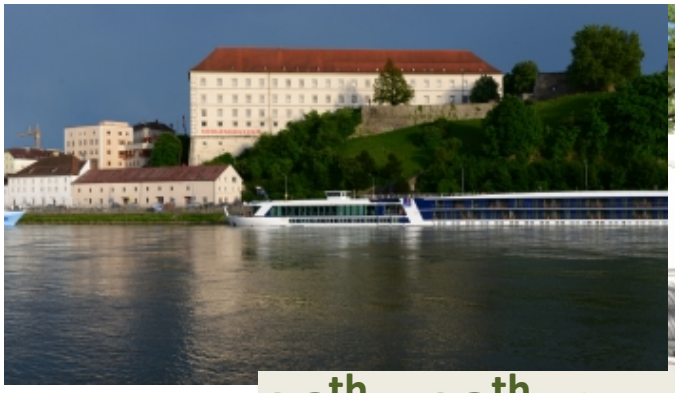
Proceedings of the

51th Annual Meeting of the Austrian Society of Tropical, Medicine, Parasitology and Migration Medicine

"IT goes tropics"



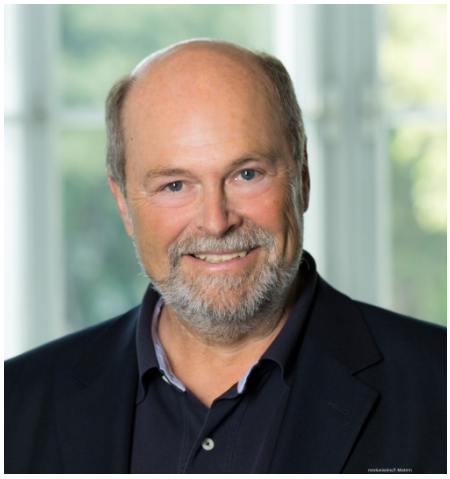
16th - 18th November 2017

OÖ Schlossmuseum, Linz, Austria

Schlossberg 1

www.ögtpm.at

Dear colleagues and friends,



Time is running and in a few days the next annual meeting of the Austrian Society for Tropical Medicine, Parasitology and Migration Medicine will start. The motto of our conference will be “IT goes tropics” to emphasize the important role of modern media and methods in our field.

This year our meeting, which is scheduled from November 16th to 18th, 2017, will be in Linz, the capital of Upper Austria. We were able to inspire Mag. Fritz Gusenleitner, head of the Department for Natural Sciences/Entomology Collections at the Center for Biology in Linz to host our conference in this wonderful town. The meeting will be held at the “Schlossmuseum Linz” which is a really breath-taking location. A special event (“Deep Space” with Prof. Fellner from Linz) on Thursday evening at the Ars Electronica Center in Linz will allow you to get insights into our organism you never were able to have before – really extraordinary!

Again we were able to invite several distinguished speakers from various fields, among them Prof. Dr. Martin Grobusch from Amsterdam, who is one of the leading scientists in the field of resistant tuberculosis and malaria, Prof. Dr. Christoph Hatz, head of the Tropical Institute in Basel, Dr. Marc Muscat from WHO regional bureau Europe and many others. Additionally, the meeting will be framed by a press conference on Thursday and a podium discussion on Friday after our general assembly dealing with the challenges of migration and tourism with respect to outbreaks of infectious diseases. These events are organized together with the ORF and are dedicated to open our society to the public.

The scientific program will cover a diversity of topics, including parasitology, tropical medicine, microbiology and travel medicine and will give opportunity to researchers to present their last scientific results. The meeting is open for submission of presentations in any aspect of tropical medicine, parasitology and migration medicine. And we particularly encouraged young researchers and scientists to submit their work: Again a poster price and a junior award for the best presentation will be sponsored.

As in the preceding years submissions may be either presented as oral presentations or in a chaired poster session giving authors the opportunity to present their work.

On this occasion I would like to thank our sponsors, who are again supporting our meeting and without their funding this meeting would not be possible.

Looking forward to seeing you in Linz for an exciting meeting

Best regards

Herwig Kollaritsch (president of ÖGTPM)

MAIN TOPICS

- IT in tropical medicine
- Travel medicine
- Infectious diseases
- Lunch symposium in German
- Veterinary parasitology
- Vectors and vector-borne diseases in Europe
- Interactive tropical/travel medicine quiz (in German)

VENUE
Schlossmuseum Linz - Oberösterreichisches Landesmuseum, Schlossberg 1, 4020 Linz, Austria

CONGRESS PRESIDENT
Herwig Kollaritsch
Institute of Specific Prophylaxis and Tropical Medicine, Center for Pathophysiology, Infectiology and Immunology, Medical University of Vienna, Kinderspitalgasse 15, 1090 Vienna, Austria

SCIENTIFIC COMMITTEE
Horst Aspöck, Michael Duchêne, Georg Duscher, Martin Haditsch, Herwig Kollaritsch, Erich Schmutzhard, Julia Walochnik, Ursula Wiedermann-Schmidt

CONFERENCE SECRETARY
Ingrid Demel
E-Mail: office@oegtpm.at

CONFERENCE FEES for registration until September 30th 2017

	3 days	2 days	1 day
Members of the ÖGTPM/ASTTM	100€	80€	60€
Non-Members	130€	100€	70€
Students / Members of ÖGTPM	50€	40€	30€
Students	60€	50€	40€

Please transfer the conference fee to the bank account until **September 30th 2017.** To claim the reduced registration fee, please make sure that you transfer the ÖGTPM membership fees for 2017 before the conference registration.

Bank details:
UniCredit Bank Austria AG, BLZ 12000, Account No. 00 601 265 002, ÖGTPM, reason for payment: Conference 2017 – *Family name, name*
IBAN AT89 1200 0006 0126 5002 BIC BKAUATWW
Students should send a copy of the ID-card to the conference secretary.

From **October 1st 2017 on there will be an additional fee of: 20€**

REGISTRATION
Please send your application form (available on the website www.oegtpm.at) to the conference secretary: office@oegtpm.at

DEADLINE FOR ABSTRACTS
Submit your abstract for oral or poster presentation (meeting language is English) latest until **October 1st, 2017** (abstract dummy is available on the website www.oegtpm.at).

Oral presentations will be limited with 10 minutes (+ 2 min discussion).

Posters shall have a maximum size A0, portrait format. The Poster Session will take place on Friday afternoon. At that time the authors are asked to be present at their posters. You can find an example for abstracts on www.ögtpm.at. Due to organisational reasons the deadline for applications will be handled strictly. The scientific board will decide if they accept presentations either as oral or as poster presentations.

JUNIOR-AWARD AND POSTER-PRIZE There will be a “Junior-Award“ for the best talk and “Poster-Prizes”. The voting will be carried out by all visitors. Main focus of the evaluation will be the agility and quality of the work and the presentation. An application for the Junior-Award/Poster-Prize is possible for all students (Master-, Diplom- and PhD) with no limit of age. Prerequisite is the membership of the ÖGTPM! The student membership fee is 10€ per year (application form on the homepage) and the membership allows a reduced conference fee as well. To apply please sign on the registration form the box “I would like to register my presentation for the Junior/Poster Award competition”. Applications who can be voted for Junior Award a marked with an “*” in the program.

TECHNIQUE
Oral presentations are possible in PowerPoint (upload using USB memory sticks). For any other way of presentation please contact the organisers.
Length of talks: 10 minutes + 2 minutes for discussion!!!

PROGRAMME

THURSDAY, NOVEMBER 16th

08:30 – 09:00 Registration

09:00 – 09:10 Welcome and Introduction

09:10 – 12:40 "IT GOES TROPICS"
(Chaired by: W. Graninger, P. Kremsner)

09:15 – 09:30 Wolfgang Graninger: Starting Cases

9:30 - 10:15 KEYNOTE LECTURE Prof. Dr. med. Christoph Hatz: **"Using methodological innovation to better understand travel risks: The Swiss TOURIST Study "**

10:15 – 11:00 KEYNOTE LECTURE Dr. Keith Raymond: **"Tropical Telemedecine: Caribbean Style"**

11:00 – 11:40 Coffee break

11:40 – 12:25 KEYNOTE LECTURE Dr. Bertrand Lell: **"IT in Lambarene"**

12:25 – 12:40 Convenience break

12:40 – 13:40 LUNCH SYMPOSIUM I (Organized by INSTAND & ÖQUASTA)
(Vorsitz: Julia Walochnik, W. Graninger)

Ralf Ignatius: **„Nachweis intestinaler Protozoen mittels kommerziell erhältlicher Multiplex-PCR assays"**
Herbert Auer: **„Seroepidemiologische Studien als Werkzeuge der Präventivmedizin**"
Wolfgang Graninger: **„Antibiotika in den Tropen"**

13:40 – 14:00 Convenience break

14:00 – 15:00 "YOUNG PARASITOLOGISTS SESSION": UPDATE ON VECTOR-BORNE DISEASES
(Chaired by: U. Fürnkranz, H.P.Fuehrer)

14:00 – 14:30 KEYNOTE LECTURE Dr. Ellen Schöner: **"The impact of conservation translocations on vector- borne parasites"**

14:30 – 14:45 Hans Peter Fuehrer: **"Malaria – An overview Is there a spillover from humans to non-human primates and vice versa?"**

*14:45 – 15:00 Edwin Kniha: **"Seroprevalence of sandfly-borne viruses in Austrian soldiers returning from missions abroad"**

*15:00 – 15:15 Adnan Hodžić: **"Arthropod-borne pathogens in red foxes in western Austria and possible transplacental transmission of *Hepatozoon canis"***

15:15 – 16:15 Coffee break

16:15 – 18:00 HIV and RESISTANCES
(Chaired by: Bernhard Haas, Erich Schmutzhard)

16:15 – 17:00 KEYNOTE LECTURE Prof. Dr. Martin Peter Grobusch: "**The threat of antibiotic resistance in tuberculosis - is there any hope?"**

17:00 - 17:30 KEYNOTE LECTURE Dr. Maria Kitchen: **"HIV/AIDS update: changing epidemiology"**

17:30 – 18:00 KEYNOTE LECTURE Dr. Christian Eggers: **"HIV/AIDS update: clinical presentation, diagnosis and treatment of neurological manifestations"**

19:00– **20:30 GET TOGETHER** Ars Electronica Center (AEC)

20:30- 21:30 "Deep Space" im AEC:
Presentation of clinical cases using the tool of cinematic rendering (3D / 8k-resolution) Prof. Dr. Franz Fellner / Prof. DDr. Martin Haditsch (German; international guests and discussions in English more than welcome: Pictures are amazing and language is minor point in this case)

FRIDAY, NOVEMBER 17th

08:30 – 09:00 Registration

09:00 – 11:45 MIXED TALKS
(Chaired by: G. Duscher, W. Pöppl)

09:00 –09:45 KEYNOTE LECTURE Dr. Mark Muscat: **"How far are we from eliminating measles and rubella in the WHO European Region?"**

*09:45 - 10:00 Martin Heidinger: **"Leprosy Disabilities – complications of the poorest?"**

10:00 – 10:15 David Leitsch: **"Drug susceptibility testing in microaerophilic parasites: Cysteine strongly affects the effectivities of metronidazole and auranofin, a novel and promising antimicrobial"**

10:15 – 10:30 Aruna Shrestha: **"Experimentally confirmed toltrazuril resistance in a field isolate of *Cystoisospora suis*"**

10:30 – 11:00 Coffee break

11:00 – 11:15 Julia Walochnik: **"Acanthamoeba as a carrier for bacterial pathogens"**

*11:15 – 11:30 Mirjana Drinić: **"From foe to friend: Carbohydrate-mediated immunomodulation by *Toxoplasma gondii* antigens against allergic diseases"**

11:30 – 11:45 Martina Köhsler: **"A reference gene for Acanthamoeba q-PCR"**

11:45 – 12:00 Barbara Hinney: **"Prevalence of endoparasites in dogs in Vienna and surrounding"**

12:00 – 12:15 Franz Jirsa: **"Helminth parasites of the mallard *Anas platyrhynchos* from Eastern Austria"**

*12:15 – 12:30 Bianca Eder: **"Tuberculosis prevalence and outcome among the non-Thai migrants in Samut Sakhon, Thailand"**

12:30 – 12:45 Convenience break

12:45 – 13:45 LUNCH SYMPOSIUM II „DIAGNOSTIK bei PARASITOSEN " (in German): (Organized by INSTAND & ÖQUASTA)
(Vorsitz: K. Janitschke, H. Aspöck)

Ingrid Reiter-Owona: „**Rope worms und Tierchen in der Haut – wie gehen wir damit um?“**
Ursula Fürnkranz: **„Diagnose und Therapie *von Trichomonas vaginalis* – ein Rückblick und eine Vorschau“**
Uwe Gross: **„Die okuläre Toxoplasmose in Südamerika – eine vernachlässigte Tropenkrankheit“**

13:45 – 14:30 Coffee break

14:30 – 15:30 POSTER SESSION
(Chaired by: R. Moser, M. Duchêne)

Jan Engel:” **Efficacy of Octenidine against Leishmania spp.”**

Walter Glawischnig:**“Selected parasites in the small intestine of red foxes (*Vulpes vulpes*) originating from the provinces Tyrol and Vorarlberg”**

Lamien Meda: **“A novel snapback method for simultaneously detection and subtyping of *Plasmodium ovale curtisi* and *Plasmodium ovale wallikeri”***

Martin Weiler: **“Tick screening on military training sites in Austria”**

Maximilian Wekerle: **“Evaluation of different disinfection approaches against *Acanthamoeba* trophozoites and cysts”**

15:30 – 16:30 GENERAL ASSEMBLY ÖGTPM (Members only)

16:30 – 16:45 PRIZE CEREMONY

Junior award sponsored by medEXCITE OG

Poster prizes sponsored by medEXCITE OG

Honorary memberships

16:45 – 18:00 DINNER sponsored by VALNEVA AUSTRIA GmbH

19.30 Podiumsdiskussion “Tourismus, Migration, Globalisierung – droht die Rückkehr von Seuchen: eine Herausforderung für die Medizin“
Moderation: J. Jetschgo
Impulsreferate: Horst Aspöck, Herwig Kollaritsch Podiumsteilnehmer: Peter Kremsner (Universität Tübingen), Georg Palmisano (Landessanitätsdirektor OÖ), Martin Haditsch (TravelMedCenter Leonding und Labor Hannover MVZ GmbH), Horst Aspöck (MedUni Wien), Herwig Kollaritsch (MedUni Wien)

SATURDAY, NOVEMBER 18th

FORTBILDUNG ÄRZTE/APOTHEKER (in German language)

08:30 – 09:00 Registrierung

9:00 – 10:30 REISEMEDIZIN I
(Vorsitz: M. Haditsch, H. Kollaritsch)

09:00 – 9:30 Martin Haditsch: **„Update Tauchmedizin: Tauchen in den Tropen"**

09:30 – 10:00 Angelika Wagner:**"Reiseimpfungen"**

10:00 – 10:30 Kaffeepause

10:30 – 12:00 REISEMEDIZIN II

10:30 -11:00 Rosemarie Moser: **„Teledermatologie in den Tropen - Vision und Wirklichkeit"**

11:00 – 12:00 Herwig Kollaritsch und Martin Haditsch: **„Reisemedizinisches Quiz mit Televoting"**

12:30 Abschluss der Tagung

Abstracts in chronological order:

Using methodological innovation to better understand travel risks: The Swiss TOURIST Study

Christoph Hatz, MD[1,2,3], Andrea Farnham, MPH, PhD[1]

[1]Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Switzerland
[2]Swiss TPH, Basel, Switzerland
[3]University of Basel, Switzerland

Reisemedizinische Forschung fokussiert traditionellerweise auf die Verhütung von Infektionskrankheiten. Viele dieser übertragbaren Pathogene sind allerdings sehr viel seltener als andere Gesundheitsprobleme, die nur selten oder gar nicht Gegenstand der Forschung sind. Chronische nicht infektiöse Krankheiten werden zum Beispiel nur punktuell erforscht, obwohl die Reisenden heutzutage viele Risikogruppen und Ältere einschliessen, welche noch vor 20 Jahren kaum gereist waren und nun mit dank den Fortschritten der Medizin zwar reisen können, aber wesentlich vulnerabler sind als die jüngeren Reisenden.
Die modernen ‚Mobilen' Gesundheitstools (mHealth) ermöglichen eine völlig neue Erforschung von Risiken, speziell während der Reise. Wir haben deshalb eine Pilotstudie in Thailand durchgeführt, in welcher wir Daten von 75 Personen zu Gesundheitsverhalten und Gesundheitsprobleme in Echtzeit während der Reise erhielten. Mit einer speziell konzipierten App auf dem Smartphone der Reisenden konnten wir so einen Einblick in Gesundheitsrisiken gewinnen, wie sie von den Reisenden wahrgenommen und entsprechend dokumentiert wurden. Die Kohorte von über 18-Jährigen wurde in zwei grossen reisemedizinischen Zentren der Schweiz rekrutiert. Sie gaben demographische und klinische Daten an und lieferten Informationen zum Risikoverhalten auf einem täglich nachgeführten Fragebogen vor, während und nach der Reise. Die Smartphone-Applikation erfasste zudem passiv Umweltdaten, Informationen zu sozialen Medien und die detaillierte Reiseroute mittels GPS. Umwelt- und Lokalisationsdaten wurden passiv durch GPS erfasst.
Nicht infektiöse Ereignisse wurden häufig registriert, Jeder fünfte Reisende erlitt einen Unfall, zwei von fünf eine Wunde oder eine Schnittverletzung, und jeder siebte wurde von einem warmblütigen Tier gebissen oder abgeleckt. Psychische Symptome wurden von 80.0% der Reisenden angegeben.
Reisemedizinische Forschung mit mHeath Technologie eröffnet völlig neue Ansätze zur Erfassung von Gesundheitsverhalten und Gesundheitsrisiken während der Reise durch die unmittelbare Erfassung von Ereignissen und Verhaltensmustern. Unsere Studienteilnehmer zeigten dabei eine erstaunlich hohe Bereitschaft die entsprechenden Angaben zu machen. Unsere Resultate zeigen, dass sich Reisende mit zahlreichen – meist relativ harmlosen aber auch bedeutenden – Gesundheitsproblemen auseinandersetzen. Dieser revolutionäre Ansatz ermöglicht das Verständnis von Risikoverhalten, gibt in der reisemedizinischen Beratung neue Zugänge und kann mittelfristig als interaktives Arbeitswerkzeug auch für die Reisenden von grossem Nutzen beim Management von Gesundheitsproblemen im Ausland sein und ermöglicht damit ein Evidenz-basiertes Vorgehen.

References

1. Farnham A, Blanke U, Stone E, Puhan MA, Hatz C. Travel medicine and mHealth technology: a study using smartphones to collect health data during travel. J Travel Med 2016;23. doi:10.1093/jtm/taw056.

2. Farnham, A, Furrer, R, Blanke, U, Stone, E, Hatz, C, Puhan, MA. The quantified self during travel: mapping health in a prospective cohort of travellers. J Travel Med. 2017 Sep; 25(5).

Tropical Telemedizin: Caribbean Style

Keith A. Raymond

The goal of this lecture is to optimize the utilization of resources by a health care team, whether those tools are human, digital, robotic, or microscopic. To do this we show how Telemedicine can make this possible. The Caribbean is a unique environment, fraught with challenges. Introducing state of the art information technology can catapult the region ahead of the first world. We examine the development of Telemedicine in its infancy, briefly. How telegraph and telephones were first used to extend a physician‘s reach. We discuss the current barriers to borderless practice, and a potential answer to the problems. Then we turn to present innovations in Telemedicine such as the use of drones to deliver blood, and the rise of the Digital and Virtual Hospitals. How, for example, Telepresence allows both patients and doctors greater freedom. Where Telemedicine is succeeding and where it has failed in practice, and the challenges ahead. We speculate on the future of Telemedicine based on present trends. How our current definition of Telemedicine may not even apply. Creation of projected nano shields, telomerase tailoring, and the formation of a genetic cloud will be discussed. 3D printing of replacement organs from autologous DNA and onsite proteins. The evolving use of surgical robots to allow sub-specialized surgeons to practice remotely. How artificial intelligence is currently used and may be used in the future, and lastly, time travel care will be presented for consideration. Finally, we define as critical the need to keep Telemedicine and other information technologies as tools to be used by physicians, while keeping the patient-doctor relationship strongly in the domain of medicine.

Information Technology in Lambaréné

Bertrand Lell
Centre de Recherches Médicales de Lambaréné
Lambaréne, Gabon

In developing countries, access to information technology is characterised by large inequalities typical for low-income regions. Modern communication and information technologies are available for large businesses and a small minority in urban centers. In contrast, rural populations often do not have access even to electricity.

Information technology presents opportunities to overcome such differences. For example, practically the whole African continent has managed to leap-frog the implementation of land line telephone systems and installed mobile phone networks. Mobile money transfer services are an example of innovations in which Africa has taken the lead.

The transition to information technology in the health care lags considerably behind that developed countries. However, the health care sector in particular has benefited from the „free and open source software" movement. Several widely used applications such as DHIS2, OpenMRS, and REDCap are proving vital for health authorities, health care centers and health research organisations, respectively.

The "Centre de Recherches Medicale de Lambarene" in Gabon has implemented several of these systems and use them in patient care, epidemiological studies, demographic surveillance and administrative tasks.

Nachweis intestinaler Protozoen mittels kommerziell erhältlicher Multiplex-PCR Assays

Ralf Ignatius[1*]

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Der mikroskopische Nachweis intestinaler Parasiten ist zeit- und arbeitsaufwändig und erfordert besonders geschultes Personal. Neue molekularbiologische Assays, die auf dem Nachweis erregerspezifischer DNA beruhen, könnten hier eine Alternative bei einigen ausgewählten Parasiten sein.

Zweihundert zuvor positiv getestete Stuhlproben von zwei verschiedenen Patientenpopulationen (Reiserückkehrern aus Deutschland und Kindern aus Ruanda im Alter von 1-4 Jahren) sowie 119 Kontrollproben wurden im BD MAX™ Enteric Parasite Panel, welches *Entamoeba histolytica*, *Giardia duodenalis* und Kryptosporidien erkennt, getestet. Hierbei zeigte sich eine hohe Sensitivität und Spezifität für alle drei Durchfallerreger.

Außerdem wurde der Roche LightMix® Modular Assay Gastro-Parasiten, welcher zusätzlich zu den o.g. drei Erregern auch *Dientamoeba fragilis* und *Blastocystis hominis* nachweist, im Vergleich mit Lichtmikroskopie und ELISAs zum Nachweis von *Entamoeba* spp. und *G. duodenalis* anhand von 1063 Stuhlproben aus der Routinediagnostik evaluiert. Neun im ELISA für *Entamoeba* spp. positive Proben waren in der PCR negativ, dafür war eine ELISA-negative Probe in der PCR positiv. Eine Gegentestung mittels PCR ergab *E. dispar* in den ELISA-positiven Proben und bestätigte *E. histolytica* in der ELISA-negativen Probe. *G. duodenalis* und Kryptosporidien ließen sich mit höherer Sensitivität durch die PCR nachweisen. Außerdem fand sich in 131 Proben *D. fragilis*, und 179 Proben waren mittels PCR positiv, mikroskopisch jedoch negativ für *B. hominis*.

Beide Multiplex-PCR Assays stellen somit interessante, hoch sensitive und spezifische Alternativen für die Routinediagnostik dar. Gut evaluierte Multiplex-PCR Assays werden in der zukünftigen parasitologischen Routinediagnostik wahrscheinlich eine bedeutende Rolle einnehmen.

Seroepidemiologische Studien als Werkzeuge der Präventivmedizin

Herbert Auer[1], Renate Schneider[1]

[1]Medizinische Parasitologie, Institut für Spezifische Prophylaxe und Tropenmedizin, Zentrum für Pathophysiologie, Infektiologie und Immunologie, Medizinische Universität Wien, 1090 Wien, Österreich

Untersuchungen zum Nachweis spezifischer, gegen Parasiten gerichteter, Antikörper werden seit mehr als 100 Jahren zur labordiagnostischen Absicherung klinischer Verdachtsdiagnosen eingesetzt. Die Sensitivität und Spezifität der dabei verwendeten Testmethoden wurde in den letzten Jahren deutlich verbessert. Serologische Tests können daher heute zusätzlich sowohl für die Überprüfung von Erfolg bzw. Misserfolg nach durchgeführten Therapien, als auch zur Erhebung der „Durchseuchung“ von Berufsgruppen oder Bevölkerungskollektiven mit bestimmten Parasiten verwendet werden.

Wir haben in den letzten 30 Jahren zahlreiche seroepidemiologische Untersuchungen zur Erhebung der Prävalenz von v. a. *Echinococcus*- und *Toxocara*-Infektionen in Österreich durchgeführt. Dabei hat sich herausgestellt, dass seroepidemiologische Studien auch als Werkzeug der Präventivmedizin eingesetzt werden können. Einige konkrete Beispiele sollen dies dokumentieren.

The impact of conservation translocations on vector- borne parasites

Ellen R Schoener[1], Isabel C Castro[2], Laryssa Howe[3], Dan Tompkins[4], Kevin Parker[5]

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[2] IAE, Massey University, Palmerston North, New Zealand
[3] IVABS, Massey University, Palmerston North, New Zealand
[4] Landcare Research, Dunedin, New Zealand
[5]Parker Conservation, Auckland, New Zealand

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Wildlife conservation in New Zealand relies on translocations of endangered species to safe sites. While knowledge of the biology and behaviour of translocated hosts has steadily increased, the role of parasites in wildlife translocations has been largely overlooked. Parasites can affect their host's survivorship during translocations by causing disease. However, failure to translocate or reintroduce a host specific parasite with its endangered host can contribute to the extinction of the parasite with unforeseen consequences for the future of the host or even the whole ecosystem. The main aims of this study were to establish baseline data on the impact of North Island saddleback translocations on their avian malaria (*Plasmodium* spp.) parasites as well as gaining further insight into potential mosquito vectors in New Zealand. The study was also intended to contribute to the development of recommendations for future parasite screening programmes for native passerine translocations. Saddlebacks and *Plasmodium* were chosen because of the detailed saddleback translocation history and its known relationship with the parasite.
As a result of this study, several *Plasmodium* lineages previously unrecorded in saddlebacks and New Zealand were identified. Nonetheless, the most frequent lineages found were cosmopolitan ones common in European birds which were introduced to New Zealand. This finding suggests that endemic parasites may have already become rare or extinct. In addition, *Plasmodium* DNA was detected in both native and introduced mosquitoes that may act as vectors. A qPCR assay was developed that was found to be a cost effective and rapid screening tool for the detection of *Plasmodium* in native birds suffering from acute infection, presenting with clinical symptoms, and in birds that were found dead.
In conclusion, future translocations should consider the movement of endemic parasites with their hosts. How this should happen is open for future studies. However, managers should start considering this issue now as New Zealand has already recorded the extinction of one endemic parasite and many more may have already been lost without knowledge.

References

Schoener, ER. The Impact of conservation translocations on vector- borne parasites. PhD thesis. Massey University, Palmerston North, New Zealand; 2016.

Malaria – An overview
Is there a spillover from humans to non-human primates and vice versa?

Hans-Peter Fuehrer[1]*

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The eradication of human malaria is one of the major goals in the field of tropical medicine in the upcoming decades. In the last decade the number of *Plasmodium* species of humans increased from four to six species, namely *P. falciparum, P. vivax, P. malariae, P. ovale curtisi, P. ovale wallikeri* and *P. knowlesi*. However, there is still a lack of knowledge about co-circulation of malaria parasites in both humans and non-human primates.

Seroprevalence of sandfly-borne viruses in Austrian soldiers returning from missions abroad

Edwin Kniha[1], Adelheid G. Obwaller[1,2], Gerhard Dobler[3], Wolfgang Poeppl[4], Gerhard Mooseder[4] and Julia Walochnik[1]

[1]Institute of Specific Prophylaxis and Tropical Medicine, Center for Pathophysiology, Infectiology and Immunology, Medical University of Vienna, Austria.
[2]Federal Ministry of Defence and Sports, Vienna, Austria
[3]Bundeswehr Institute of Microbiology, Munich, Germany
[4]Department of Dermatology and Tropical Medicine, Military Hospital Vienna, Austria.

Phleboviruses belong to the prominent group of Arthropod-borne (Arbo) viruses. They are transmitted by either sandflies, ticks or mosquitoes to several vertebrate species. Because their life cycles include phylogenetically distant groups, they feature a highly efficient replication. A special feature of phleboviruses is the tri-segmented genome, which lacks a proofreading activity and can result in high mutation rates, enhanced virulence and the formation of new species. Humans are considered as dead-end hosts in the transmission cycle and infections are often asymptomatic. Still, the development of a self-limiting febrile illness, or also of meningitis and meningoencephalitis is common. To date, no vaccine or chemoprophylaxis against phleboviruses are available. Nine Phlebovirus species are known, distributed in the Old World, the New World and Australia following the distribution of their respective vectors. In areas where phleboviruses circulate, military personnel are at an increased risk of infection and several cases of febrile illnesses among military troops have been documented.
In this study, 486 sera of soldiers returning from Bosnia and Herzegovina, the Kosovo, Syria and the Lebanon and 500 sera of soldiers prior to their operation, functioning as a control group, were investigated. An indirect-immunofluorescence assay with subsequent fluorescence microscopy was used to detect anti-Phlebovirus antibodies.
Seroprevalences of up to 20.69% were observed and Phlebovirus diversity varied between the operational areas. Moreover, risk factors associated with an infection were assessed. This study provides the first data on Phlebovirus seroprevalences in Austrian Army personnel and in Austria altogether. The results reveal a risk of infection in different operational areas and indicate the importance of exposition prophylaxis.

Arthropod-borne pathogens in red foxes in western Austria and possible transplacental transmission of *Hepatozoon canis*

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The main aim of this comprehensive molecular study was to investigate the occurrence and diversity of protozoan, bacterial and filarial parasites transmitted by blood-feeding arthropods in a red fox population from the two westernmost Austrian provinces, the Tyrol and Vorarlberg. Blood and spleen samples from the foxes were analysed by molecular tools and the following pathogens were identified: *Babesia canis*, *Babesia* cf. *microti* (syn. *Theileria annae*), *Hepatozoon canis*, *Anaplasma phagocytophilum*, *Candidatus* Neoehrlichia sp. (FU98) and *Bartonella rochalimae*. Blood was significantly more frequently positive for *Babesia* cf. *microti* ($p < 0.0001$) compared to spleen, but the positivity rate of *H. canis* was higher in the spleen ($p < 0.05$) than in blood. Moreover, extremely low genetic variability of *H. canis* and its relatively low prevalence rate observed in this study may suggest that the parasite has only recently been introduced into the sampled area. Furthermore, our findings demonstrated the occurrence of the possible vertical transmission of *H. canis* in foxes, and this could explain the very high prevalence in areas considered free of the parasite's main tick vectors.

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HIV and RESISTANCES session

The threat of antibiotic resistance in tuberculosis - is there any hope?

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The World Health Organization has called for gearing up towards tuberculosis elimination by mid-century. With only around 30 years to go and currently 10 million new disease episodes and more than 1 million deaths per year, a lot of work has to be accomplished to get as close as possible to that target within a relatively limited time frame. The challenges are manifold, amongst which the emergence of drug-resistance features prominently.

The talk will summarize the current epidemiology of drug-resistant tuberculosis (DR-TB), highlight briefly novel developments in diagnosis and treatment, and identify three areas of discussion in the quest for curbing the global epidemic of drug-resistant TB:

How to reach those hard-to-reach
Whilst the dimension of the problem might appear limited in terms of absolute numbers of patients, MDR-TB is by no means confined to low and middle income countries (LMICs). In Western Europe for example, TB as a whole and with it DR-TB is increasingly evolving into a problem mainly of marginalised population groups. Possible strategies of reaching out to those more efficiently will be discussed.

No magic bullets without magic guns
The armamentarium to diagnose and treat DR-TB has been growing immensely over the past couple of years, and continues to do so. However, very often, there is a substantial problem in delivering and applying those tools to the field as rigorously as needed. As examples will demonstrate, currently we might fail rather on the implementation than on the innovation side; and whilst easy solutions are not at hand, progress in improving the use of the tools we already have may by-and-large determine the progress towards enhancing tuberculosis control towards the ambitious elimination goal.

Small countries matter
Understandably, current efforts to improve DR-TB control focus on those countries with the highest absolute disease burden. An example from Central Africa will be used to demonstrate that small countries with a high relative (DR-)TB burden will have to be accounted for, if significant progress in DR-TB control ought to be achieved in the long term on a global scale.

HIV/AIDS update: changing epidemiology

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UNAIDS estimates that 36.7 million people are living with HIV globally. Since the start of the epidemic 35 million people have died from AIDS-related illnesses, the estimate for 2016 is 1 million deaths. During the same year, 1.8 million people got newly infected with HIV. There is still no cure or effective vaccine to prevent the infection. There are, however, many HIV prevention approaches available, and the target to end the epidemic by 2030 could be reached. Due to the global scale-up of antiretroviral treatment and the 2015 WHO recommendation for treatment of all persons living with HIV (regardless of CD4 count) an impressive decline of deaths due to HIV and of new infections has been observed in most parts of the world ("treatment as prevention"). In 2016, almost 20 million people were accessing antiretroviral treatment, representing more than half of all people with HIV. The sharpest decline in deaths has been seen in Eastern and Southern Africa, where they peaked in 2004 (1.1 million) and plummeted by 62% to 420.000 in 2016. This decline is more rapid among women, due to higher treatment coverage (67%) and better adherence. However, the most vulnerable age group for new HIV infection in Africa are now adolescent girls. Mother-to-child transmission has fallen globally, in 2016 around 76% of pregnant women with HIV had access to antiretroviral medicines to prevent transmission of HIV to their babies.
In lower prevalence settings the majority of HIV infections occur in key populations. MSM (men who have sex with men) account for the majority of new infections in Western Europe and Northern America. People who inject drugs, sex workers, and prisoners are among key populations in Eastern Europe and Central Asia. Sadly, this is the only region in the world with rising numbers of new infections and deaths, partly due to a lack of harm reduction measures and prevailing stigma and discrimination of people most at risk. In Western Europe and North America some cities and regions are already on track towards ending the HIV epidemic by 2030, mainly by achieving the target of "90-90-90": 90% of people living with HIV should know about their infection, 90% of those diagnosed should be on antiretroviral treatment, and 90% of those treated should have an undetectable viral load (and therefore not be infectious). In addition, further measures such as pre- and post-exposure prophylaxis, male circumcision, easy access to testing and treatment, and reduction of stigma will also be necessary to make the end of HIV/AIDS a reality.

HIV/AIDS update: clinical presentation, diagnosis and treatment of neurological manifestations

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With the advent of the ever improving combination antiretroviral treatment (cART) the neurological manifestations of HIV infection have changed considerably. Due to preserved or restored immune function the life threatening cerebral opportunistic infections such as toxoplasmosis, cryptococcosis, progressive multifocal encephalopathy (PML) and primary central nervous system lymphoma have become rare. The same applies for the full blown HIV dementia which is mainly due to uncontrolled viral replication in the brain compartment. However, minor forms of HIV-associated neurocognitive disorders (HAND) persist despite virologically suppressive antiviral treatment. The reasons for this phenomenon are manifold and not fully understood although the nadir of immunosuppression (CD4-T-Cells) and aspects of chronic cerebral inflammation likely play a major role. The presentation covers the clinical presentation, diagnosis, pathogenesis and treatment of HAND, and gives a short overview about new developments in the management of opportunistic infections.

How far are we from eliminating measles and rubella in the WHO European Region?

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The incidence of measles and rubella in the WHO European Region, that comprises 53 Member States, declined dramatically with long-standing and widespread use of measles- and rubella-containing vaccines. According to the evaluation conducted in 2017 by the European Regional Verification Commission for Measles and Rubella on 51 countries that provided data for 2016, 42 countries interrupted measles transmission, 33 of which interrupted transmission for 36 months and therefore considered to have eliminated measles. For rubella, 37 countries interrupted rubella transmission, 33 of which interrupted transmission for 36 months and therefore eliminated rubella [1].

Despite this progress, the Region continues to face challenges in interrupting endemic transmission of these diseases. Between January-June 2017, 9386 measles cases were reported in 40 countries among 50 countries that submitted measles data [2]. Of these, 77% (n=7243) were reported by 4 countries: Italy (n=3660; 51%), Romania (1844; 25%), Ukraine (943; 13%) and Germany (796; 11%). Of those with known age group (n=9384), 2024 (22%) were 1–4 years of age, 2355 (25%) were 5–19 years of age and 3973 (42%) were ≥20 years. Vaccination status was known in 7840 cases (84%), of which 6541 cases (83%) were unvaccinated.

For the same period, 388 rubella cases were reported in 16 countries among 45 countries submitting rubella data [2]. Most cases were reported by Poland (n=253; 65%), followed by Italy (46; 12%), Germany (42; 11%) and Austria (26; 7%).Of the total, 71 (18%) cases were laboratory-confirmed. Vaccination status was known in 334 of cases (86%) of which 170 (51%) were unvaccinated cases. Poland had the highest incidence (6.6 cases per million inhabitants); however, no cases were laboratory-confirmed. Of the total cases, 249 cases (64%) were 1–19 years old and 101 cases (26%) were ≥20 years old.

With 9385, the number of measles cases reported for the first half of 2017 exceeded that reported for the entire year of 2016 (n=5194). Conversely, for rubella, there were 58% less reported cases for the same period in 2016 (n=913). Despite most countries in the Region have reached the elimination status for measles and rubella, there still needs to be strong and sustained political commitment to eliminate these diseases in each country. The cornerstones for eliminating these diseases remain high population immunity to stop disease

transmission and high-quality surveillance to monitor disease occurrence for public health action but also to adequately ascertain their absence in the elimination process.

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Leprosy Disabilities – Complications of the Poorest?

Retrospective Analysis of Socioeconomic Parameters and Disability-Scores in Leprosy Affected Persons in Salem, Tamil Nadu, India

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Introduction

Leprosy is a chronic, granulomatous infectious disease caused by *Mycobacterium (M.) leprae*.[1] It can decisively be called a disease of the poor. However, it is not yet clear what kind of poverty, (solely financial, or social inequalities) contributes most to the risk of transmission, infection and successful therapy.[2–5] The objective of this study was to determine, which socioeconomic parameters may account for higher severity of disabilities in persons affected by leprosy.

Material and Methods

In October 2016 the Department for Global Health and Development (GHD) of the Medical University of Graz, together with the Doctor Typhagne Memoriable Charitable (DTMC) Trust adapted the leprosy register in Salem, Tamil Nadu, India. Within a two-month observational period, participants with a successfully treated infection with *M. leprae*, disabilities of grade-1 or higher on eyes, hands and/or feet and an age of 18 years or older were included in the survey, which consisted of demographic, economic, household and disability parameters. Disabilities were rated according to WHO's disability definitions from zero to two [6] and computed to the Eyes-Hands-Feet (EHF) Score with a maximum rating of twelve points.
A descriptive statistical analysis was undertaken using a one-way analysis of variance.

Results

A total of 123 patients were included. The study population showed a high level of illiteracy (81,30%), and an average monthly income of 1252 Indian Ruppee (13,98€). Almost two-thirds showed grade-2 disabilities on both hands (64,23%) or both feet (61,79%). Fifty-one percent were found to have grade-2 disabilities on both hands and both feet. The EHF-Score average was 7,02. EHF Scores showed significantly higher scores for participants aged 65 years or above, persons earning 1000 INR per month or less, and affected persons with less than 30m^2 of living space. (**Figure 1**)

Conclusion

Socioeconomic parameters like age, monthly income and living space significantly contribute to higher disability scores. Therefore, these variables are fundamental, concerning the progression of disabilities. Besides prevention and standard treatment, a focus should be put on disability progression especially after the completion of treatment in the socioeconomically weakest groups.

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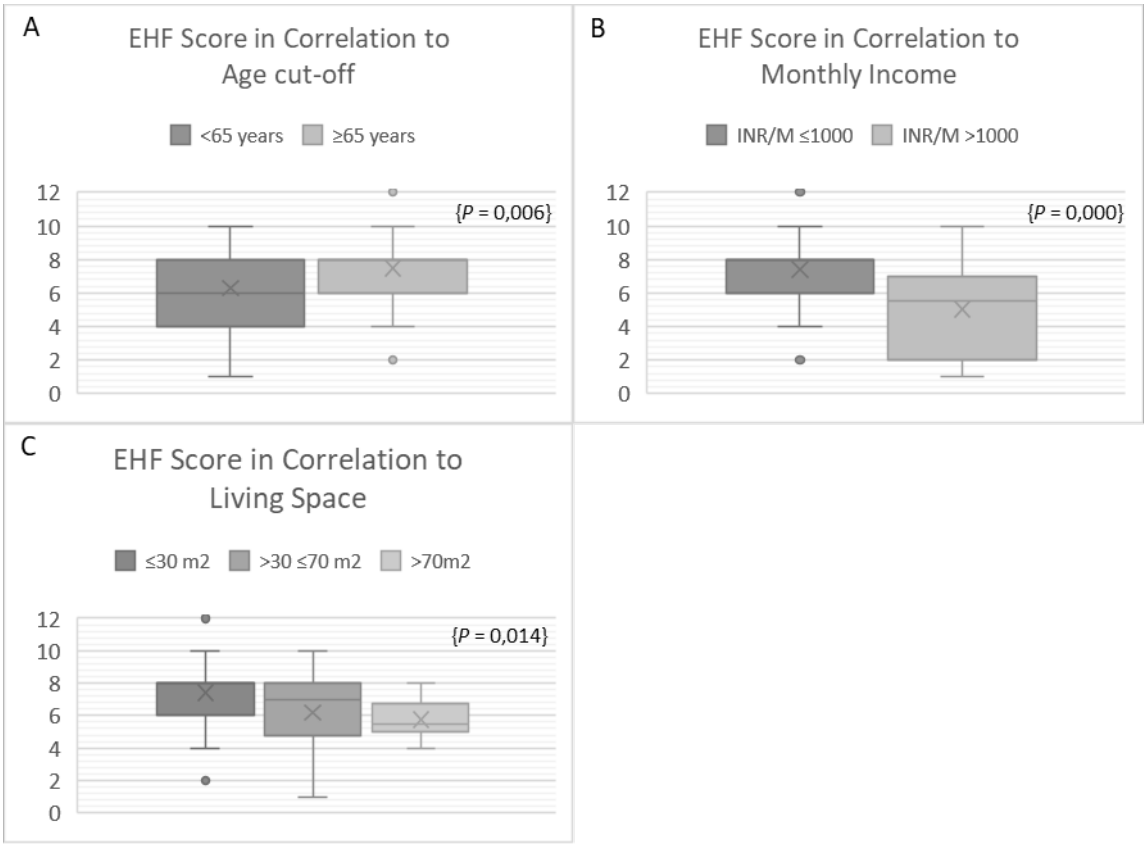
Figure 1 – EHF Score in Correlation to Socioeconomic Parameters



Drug Susceptibility Testing in Microaerophilic Parasites: Cysteine strongly affects the effectivities of Metronidazole and Auranofin, a novel and promising antimicrobial

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The microaerophilic parasites *Entamoeba histolytica*, *Trichomonas vaginalis*, and *Giardia lamblia* annually cause hundreds of millions of human infections which are treated with antiparasitic drugs. Metronidazole is the most often prescribed drug but novel drugs with improved characteristics are constantly being developed. One of these novel drugs is auranofin, an antirheumatic relabelled for the treatment of parasitic infections. Drug effectivity is commonly assessed in susceptibility assays using *in vitro* cultures of a given pathogen. However, drug susceptibility assays can be strongly affected by certain compounds in the growth media such as cysteine. Cysteine is added in large amounts as an antioxidant but is generally highly reactive and known to modulate the toxicity of metronidazole in several microaerophilic parasites. Cysteine concentrations could be reduced without affecting parasite viability by performing drug susceptibility assays under strictly anaerobic conditions in an anaerobic cabinet. Indeed, *T*. *vaginalis* and *E*. *histolytica* could be grown without any cysteine added and the cysteine concentration necessary to maintain *G*. *lamblia* could be reduced to 20%. Susceptibilities to metronidazole were found to be clearly reduced in the presence of cysteine. With auranofin the protective effect of cysteine was extreme, providing protection to concentrations up to 100-fold higher as observed in the absence of cysteine. With three other drugs tested, the effect of cysteine was less pronounced. Oxygen was found to have a less marked impact on metronidazole and auranofin than cysteine but bovine bile which is standardly used in growth media for *G*. *lamblia*, displayed a marked synergistic effect with metronidazole.

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Experimentally confirmed toltrazuril resistance in a field isolate of *Cystoisospora suis*

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Cystoisospora suis is the causative agent of porcine neonatal coccidiosis, which causes transient, pasty to watery diarrhea in neonatal piglets with the consequence of weight loss, ill thrift and occasionally secondary bacterial infections with high morbidity. In the European Union, toltrazuril is the only registered drug for metaphylactic treatment which is administered once in the first week of life as an oral suspension. Constant treatment regimes in intensive production systems are being applied for ca. 20 years now, and the possibility of resistance development has not been addressed so far despite the limited availability of effective treatment. In 2016 a pig farm in The Netherlands complained about neonatal diarrhea despite toltrazuril application in the absence of bacterial or viral pathogens. Evaluation of the administered amount of toltrazuril revealed no underdosing, and resistance was suspected. Consequently, piglets experimentally infected with the field isolate in question (4th day of life) were treated with 0, 20 or 30 mg/kg of body weight (BW) of toltrazuril 2 days post infection (n=8 piglets/group) and fecal samples were taken daily individually from the 4th to the 18th day post infection to evaluate oocyst excretion and fecal consistency. A separate litter infected with a toltrazuril-susceptible strain of *C. suis* and treated with 0 or 20 mg/kg BW (n=5 piglets/group) was infected and sampled identically for comparison. Toltrazuril completely suppressed oocyst excretion and reduced diarrhea significantly in piglets infected with the susceptible strain, while the new field isolate revealed similar patterns of oocyst excretion and fecal consistency in treated and sham-treated animals, indicating a complete loss of efficacy of toltrazuril as already indicated by the farm history. As no effective and economically sustainable alternative treatment is available in such cases, veterinarians and farmers should be aware of the possibility of resistance development and be instructed to undertake measures to retain the efficacy of toltrazuril in intensive piglet production systems.

Acanthamoeba as a carrier for bacterial pathogens

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Owing to their ubiquity, their resilience and their extremely robust cysts, the representatives of the genus *Acanthamoeba* are of particular importance as carriers of other microorganisms, harbouring them inside their cells and protecting them from adverse environmental conditions. Acanthamoebae can act as host cells for viruses, bacteria and fungi. Also several potential pathogens have been demonstrated to survive or even multiply within their cells, including among others *Burkholderia* spp., *Chlamydia* spp., *Legionella* spp., *Listeria monocytogenes*, *Mycobacterium* spp. and *Vibrio cholerae*. Over the past years, in several projects with numerous collaborators, we screened water and soil samples from various habitats for amoebae and further screened the isolated amoebae for intracellular bacteria, both by culture and molecular techniques.
We have demonstrated that *Acanthamoeba* is the predominant amoebozoan genus in Austrian engineered waters, its presence and viability not being affected by regular disinfection and correlating with the occurrence of legionellae. Further, we have shown that even non-culturable legionellae can infect *Acanthamoeba* spp. and also human macrophages. Moreover, we have explored the role of Acanthamoeba as a carrier for various chlamydiae and provided the first confirmation for *Acanthamoeba* being a natural host for *Burkholderia pseudomallei*, the causative agent of melioidosis. Altogether, we have isolated numerous environmental and also clinical strains of various *Acanthamoeba* species and genotypes that naturally harboured diverse bacteria, occasionally also of more than one species at the same time.

From foe to friend: carbohydrate-mediated immunomodulation by *Toxoplasma gondii* antigens against allergic diseases

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The link between reduced incidence of allergic diseases and infection with certain parasites has been repeatedly confirmed in numerous epidemiological and experimental studies. The so called “hygiene hypothesis” has opened a new field in allergy research aiming at identifying parasite-derived immunomodulators. We have previously shown that both, infection with *Toxoplasma gondii* and treatment with inactivated extract of *Toxoplasma* oocysts, prevented the development of allergy in a mouse model. In this study, we tested whether this beneficial effect could also be achieved by extracts derived from *T. gondii* tachyzoites (TLA), the *Toxoplasma* developing stage, which unlike oocysts, can be easily cultured.

Immunization of naive BALB/c mice with TLA triggered mixed Th1/Th2 immune response, with induced antigen-specific IgG1 and IgG2a in serum and with high levels of IL-6, IFNγ and IL-10 as well as IL-4 and IL-5 in the spleen. In a mouse model of OVA allergy, we demonstrated that co-application of TLA during sensitization and challenge with OVA reduced the development of airway inflammation, with decreased airway hyperresponsiveness associated with reduced peribronchial and perivascular cellular infiltration. Also OVA-specific IgG1 in the serum, IgE-dependent basophil degranulation, and production of OVA-specific Th2 cytokines in the lungs and spleen were reduced. Furthermore, we could show that TLA did not lose its immunomodulatory properties after heat-inactivation or proteinase K-treatment for disruption of proteins, but it did so after deglycosylation with sodium metaperiodate, suggesting that glycans may play a role in immunomodulatory properties of TLA.

Our results indicate that certain parasite-derived molecules may be responsible for the benefits of parasitic infection, offering new approaches for adjuvants in the treatment of immune mediated diseases such as allergy.

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A reference gene for *Acanthamoeba* q-PCR.

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Acanthamoebae are primarily free-living, ubiquitously spread organisms that are able inhabit a wide range of habitats. However, under certain circumstances they can act as facultative pathogens, being the causative agents of several disseminating infections, mostly in immunocompromised individuals, and more importantly they are the causative agents of an often seriously progressing keratitis, occurring predominantly in contact lens wearers.

Quantitative real-time PCR (qPCR) is considered to be a very accurate and reliable technique to evaluate gene expression of an organism. qPCR quantitatively measures fluorescence generated after each PCR cycle, being highly sensitive, precise and less time-consuming than conventional PCR. However, in order to achieve reliable results an appropriate normalisation method is necessary. For this purpose reference genes are employed as internal reaction control with expression levels unaffected by experimental factors.

A precondition for future studies on the protein expression of *Acanthamoeba* spp. is the establishment of a well-functioning qPCR with reliable reference genes. Since very little work has been done in that area so far and no standard reference gene for *Acanthamoeba* qPCR has been established yet, the aim of our study was to evaluate and compare possible candidates for *Acanthamoeba* qPCR.

Glycerinaldehyde-3-phophate dehydrogenase (GAPDH), triose phosphate isomerase (TPI), actin, porphobilinogen deaminase (PBG-D), TATA-binding protein (TBP), hypoxanthine phosphoribosyl transferase (HPRT1), glucose-6-phosphate dehydrogenase (G6PD) and 18S rRNA gene sequences were chosen to design primers targeting these potential reference genes. The primers were tested with conventional PCR. Subsequently, qPCR with genomic DNA of an *Acanthamoeba* reference strain was performed and efficiencies were calculated. Based on these results the most promising genes were compared using four *Acanthamoeba* strains with different properties cultivated in our lab. Amoebae in their logarithmic growth phase and in their stationary phase were harvested, counted, total RNA was extracted and cDNA was synthesised for subsequent qPCR.

Several of the tested reference genes showed very high CT values and had to be excluded. The most promising genes tested were actin, HPRT1 and the 18S rRNA gene with equal CT values for all four tested strains in log-phase and stationary phase in independent consecutive experimental setups. Further experiments will be undertaken in order to verify these results and enable the establishment of an *Acanthamoeba* qPCR with at least to two reliable reference genes.

Prevalence of endoparasites in dogs in Vienna and surrounding

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Endoparasites of dogs may be harmful to their host and some of them have a zoonotic potential [1]. In metropolitan regions the high population density of dogs may result in a higher infection risk. To access this risk it is important to know the endoparasite prevalence [2].
This study aimed to estimate the endoparasite prevalence of dogs in Vienna. Also a comparison of prevalences between densely and less densely populated districts of Vienna, "clean" and "dirty" dog zones as well as between Vienna, rural (Wolkersdorf) and peri-urban (Mödling) regions was performed.
A representative number of 1001 anonymous faecal samples from 55 dog zones from all 23 districts of Vienna were collected. Other 480 faecal samples were derived from the Mödling district and Wolkersdorf. Faeces were examined by flotation and by Baermann technique. Additionally 292 Viennese, 102 peri-urban and 50 rural samples were tested for *Giardia* and *Cryptosporidium* by GiardiaFASTests® and CryptoFASTests®.
With 4.0 – 10.8% *Giardia* was the most prevalent parasite, *Trichuris* with 1.5-15.7% the most prevalent helminth. *Toxocara,* Ancylostomatidae*, Crenosoma, Capillaria,* Taeniidae*, Cystoisospora* and *Sarcocystis* were found in 0.6-1.9%, 1.8-2.2%, 0-0.9%, 0-0.9%, 0-0.6%, 0.3-3.1% and 0-0.6% of the samples, respectively.
Samples from the rural region Wolkersdorf and samples from "dirty" dog zones were significantly more often parasite-positive.
This is the first representative prevalence study about endoparasite prevalences in dogs in Vienna. Interestingly a high dog density does not seem to cause a higher risk for endoparasite infections in dogs, most probably due to the regulations that dog-faeces has to be removed. Dogs from rural areas seem to have a higher risk of endoparasite infection. Dog owners should be encouraged to remove dog faeces to reduce the infection risk for both dogs and humans.

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Helminths parasites of the mallard *Anas platyrhynchos* from Eastern Austria

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Although the mallard is the most abundant water bird species in Eastern Austria a record of its helminth community is still missing. This work therefor aimed to close this gap and tried to record and analyse the parasite community of a greater number of *Anas platyrhynchos* from Austria for the first time. A total of 60 specimens of the mallard, shot by hunters in fall of 2009 in Eastern Austria were examined for intestinal parasites. The following taxa could be recovered (prevalences given in parenthesis): Cestoda: *Diorchis acuminatus* (31.7%) and *Fimbriarioides intermedia* (1.7%), Acanthocephala : *Filicollis anatis* (5%), *Polymorphus minutus* (30%) and one cyctacanth unidentified (1.7%), Trematoda: *Apatemon gracilis* (3.3%), *Echinostoma grandis* (6.7%), *Echinostoma revolutum* (6.7%) and *Notocotylus attenuates* (23.3%), Nematoda: *Porrocaecum crassum* (1.7%) and one not identified (1.7%). *P. minutus* was observed in high morphological variability, which gave reason for a molecular genetic characterization by DNA barcoding. Species identification was confirmed by comparing data with the reference COI sequence from *P. minutus* available in GenBank. The frequency distribution of parasites shows a typical pattern (Figure1), in which 39 birds (65%) were not parasitized or were harboring up to 5 worms, whereas more intense infestations occurred in a lesser number of hosts.

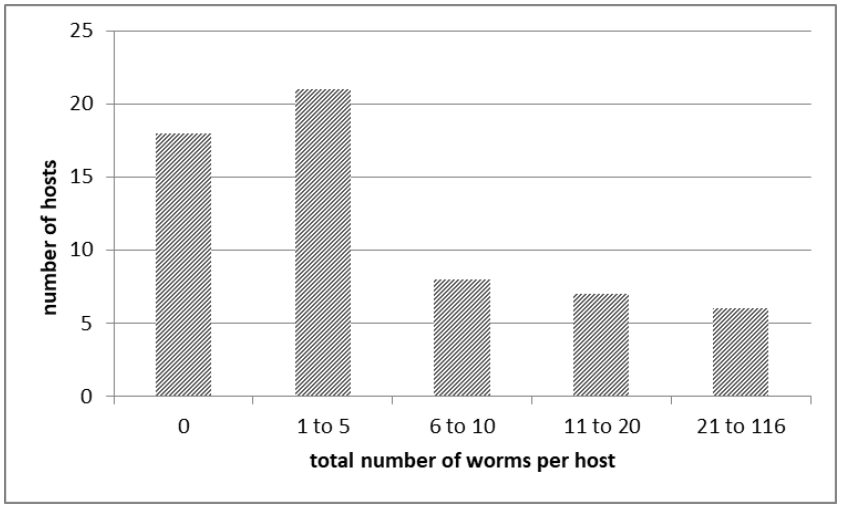

Figure 3: frequency distribution of intestinal helminths in *A. platyrhynchos*

Tuberculosis prevalence and outcome among the non-Thai migrants in Samut Sakhon, Thailand

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Objectives
The global migrant crisis hit an unprecedented high in 2016 with 65.3 million persons displaced. During the past 30 years, Thailand has faced dramatic transnational migration, with Samut Sakhon Province (SSP) hosting the country's second largest migrant population. Tuberculosis (TB) still represents one of the top infectious disease killers worldwide, causing a tremendous burden on the global community. SSP is a prototype environment for TB in this population. This study aimed to evaluate the TB prevalence among migrants screened as part of health-insurance enrolment at Samut Sakhon General Hospital (SSGH). Additionally, the features and outcomes of non-Thai patients with verified TB treated at SSGH were assessed.
Methods
For this retrospective study, data of migrants presenting for mandatory chest X-ray (CXR), within the context of registration, between October 2013 and September 2016 at SSGH were analysed for the first objective. TB diagnosis was based on abnormal CXR findings, sample smear positive for Acid Fast Bacilli (AFB) or Xpert MTB/RIF. For the second objective hospital records of non-Thai TB patients between October 2014 and September 2016 were assessed.
Results
The results showed that an overall 380,672 Non-Thais were screened. The majority (157,521) in the fiscal year 2014. For the fiscal years 2014, 2015, and 2016, the TB prevalence was 0.017%, 0.066%, and 0.023%, respectively. The cohort with verified TB (n=395) was predominantly male (62%), of Burmese ethnicity (90%), in the age group of 25-34 years (43%), HIV negative (83%), and diagnosed with pulmonary TB (92%). 50% of individuals were AFB negative, DOT was available for 28% and on day 6 after final diagnosis 90% of patients were undergoing treatment. A success rate of 73% could be achieved with 20% defaulted patients and 4% transferred out. Multivariate analysis showed that an HIV negative status and AFB negative results were related to significant differences in successful outcome.
Conclusion
It appears that the TB prevalence of the screened population does not represent true TB numbers in non-Thais in this population, possibly due to high numbers of migrants not being traced after showing an abnormal CXR. The highest ever screening numbers of 2014 in SS, after the implementation of One Stop Registration Services, suggest that migrants are willing to accept health care systems if available and accessible to them. The decline of registration numbers in 2015 could indicate the interconnectivity beyond national borders. A treatment

success rate equal to previous numbers of 2011, with high default and transferred out rates, highlights the difficulties of health care institutions and governments when faced with this challenging population.

Rope worms“ und Tierchen in der Haut – wie gehen wir damit um?

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In industrialisierten Staaten nimmt die Parasitenlast der Bevölkerung kontinuierlich ab, wohingegen bei Tropenreisenden und Immigranten aus warmen, ländlichen Regionen Parasiten mit einer höheren Wahrscheinlichkeit zu erwarten sind. Im Vergleich zu fast allen möglichen Parasitosen ist die falsche Vorstellung, von Parasiten befallen zu sein, die am schwierigsten zu behandelnde Krankheit.

Bei Phänomenen wie den sog. „robe worms“ (Seilwürmer, Homo funis vermis!) wird mittels pseudowissenschaftlicher Abhandlungen die Existenz von bislang unbekannten Darmwürmern propagiert und diese „Erkenntnis“ insb. mittels elektronischer Medien verbreitet. Hierbei handelt es sich wahrscheinlich um sog. Hoaxes (im Internet bewusst verbreitete Falschinformation), die der Ankurbelung von Geschäften mit alternativen, darmreinigenden Medikamenten dienen sollen.

Unter dem Krankheitsbild des Parasiten- (Dermatozoen-) wahns verbirgt sich die subjektive Gewissheit des Patienten, von Parasiten befallen zu sein. Ausgelöst durch einen realen oder fiktiven Erstkontakt mit dem vermuteten Erreger wird an der krankhaften Fehlbeurteilung der Wirklichkeit mit hoher Gewissheit und somit unkorrigierbar festgehalten. Die Betroffenen konsultieren zahlreiche Ärzte und Fachlaboratorien, weil sie bei Nichtbestätigung ihrer Eigendiagnose unzureichendes Fachwissen der Ärzte oder Mängel bei der klinischen und labordiagnostischen Untersuchung vermuten. Führt die Einsendung von selbst entnommenem Probenmaterial und das „Doctorhopping“ nicht zum gewünschten Erfolg, brechen diese Patienten den Kontakt zum Arzt ab und wenden sich der alternativen Medizin und/oder Eigentherapie zu. Dies kann zur erheblichen Beeinträchtigung der „besiedelten“ Organe (Haut, Darm) führen und verschlechtert den seelischen Zustand erheblich.

Eine psychiatrische Exploration ist erforderlich, wenn die ausführliche Anamnese, auch Tropenreisen, sowie körperliche (dermatologische, internistische, neurologische) und labordiagnostische Untersuchung keinen Anhaltspunkt für eine Infektion mit Parasiten erbringen. Eine Chemotherapie mit Antiparasitika sollte bei negativem Laborbefund möglichst unterbleiben. Idealerweise werden die Patienten in eine interdisziplinäre Spezialambulanz überwiesen, wo Psychiater, Dermatologen, Internisten, Neurologen und Parasitologen kooperieren.

Am Universitätsklinikum Bonn wird seit 7Jahren die Strategie erprobt, diese Patienten nach Erstkontakt mittels einer fächerübergreifenden Arbeitsanweisung zu leiten und sie einer adäquaten Therapie zuzuführen. Anhand von Fallbeispielen wird die Problematik des Krankheitsbildes dargestellt und abschließend versucht, eine Erfolgsbilanz der interdisziplinären Initiative zu ziehen.

Diagnose und Therapie von *Trichomonas vaginalis* – ein Rückblick und eine Vorschau

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Trichomonas vaginalis ist der Erreger der weltweit häufigsten, nicht viralen, sexuell übertragbaren Krankheit, der Trichomonose. Die Zahl der Neuerkrankungen übersteigt jene von Syphilis und Gonorrhoe zusammen. Dennoch muss man von einer noch höheren Zahl an *T. vaginalis*-TrägerInnen ausgehen, da die Informationen über asymptomatische Fälle unvollständig sind und zwischen 11 und 85% schwanken. Eine Infektion mit *T. vaginalis* geht meist nur bei Frauen mit Symptomen einher. Diese umfassen vor allem übelriechenden vaginalen Ausfluss und Juckreiz. Eine weitaus schwerwiegendere Folge einer *T. vaginalis*-Infektion ist ein erhöhtes Risiko von HIV-Übertragung. Des Weiteren wurden Infektionen mit *T. vaginalis* als potentielle Auslöser für verschiedene Krebsarten beschrieben, und auch ein Zusammenhang mit Unfruchtbarkeit und Frühgeburten wird diskutiert.
In diesem kurzen Übersichtsvortrag möchte ich speziell auf Diagnostik und Therapie von *T. vaginalis* eingehen. Die Diagnostik beruht sehr oft immer noch auf der Mikroskopie oder Kultur des Erregers. Ich möchte in diesem Zusammenhang noch weitere Diagnostik-Methoden vorstellen, die durchaus ihre Vor-, aber auch Nachteile haben. Zur Therapie von *T. vaginalis* werden hauptsächlich 5-Nitroimidazol-Derivate eingesetzt. In Österreich ist nur Metronidazol (z.B. Anaerobex®, Trichex®,) zugelassen, Tinidazol in Deutschland und der Schweiz. In dem Vortrag werde ich einige andere Therapeutika vorstellen, die einerseits schon klinisch getestet wurden, oder *in vitro* erfolgversprechend waren.

Die okuläre Toxoplasmose in Südamerika – eine vernachlässigte Tropenkrankheit

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Seit einigen Jahren wird über besonders schwer verlaufende Formen der Augentoxoplasmose vor allem in Erechim, Rio Grande do Sul in Südbrasilien berichtet (Übersicht bei Maenz et al., 2014). Erst kürzlich konnten ähnliche Beobachtungen auch in der angrenzenden argentinischen Provinz Misiones gemacht werden (Rudzinski et al., 2016). Während die Prävalenz der schweren Augentoxoplasmose in Misiones jährlich 1 Fall/10.000 Einwohner beträgt, wird die Prävalenz in Buenos Aires mit weniger als einem Zehntel dieser hohen Zahl angegeben (1 Fall/133.333 Einwohner).
Eine mögliche Ursache für die regional unterschiedliche klinische Präsentation der Toxoplasmose in dieser Region Südamerikas könnte u.a. in der Geschichte ihrer Einwohner begründet sein: Die Provinz Misiones wurde im frühen 20. Jahrhundert von Immigranten aus Deutschland und slawischen Ländern besiedelt, die sich - über Südbrasilien kommend - dort niedergelassen haben. Interessanterweise deuten erste Untersuchungen darauf hin, dass in Misiones Patienten mit slawischen Wurzeln signifikant häufiger an einer Reaktivierung einer Augentoxoplasmose leiden, als die dort lebenden Ureinwohner Argentiniens (Rudzinski et al., 2016). Bisher ist unklar, ob genetische Faktoren des Menschen oder eine unterschiedliche Virulenz von *Toxoplasma*-Stämmen für diese Unterschiede verantwortlich sind. In Europa kommen aber vor allem Typ II-Stämme von *Toxoplasma gondii* vor, wohingegen die Parasitenstämme in Südamerika – insbesondere in der Provinz Misiones - eine hohe genetische Variabilität aufweisen (Moré et al., 2012). Zusammen betrachtet könnten diese Daten die Hypothese untermauern, dass Einwanderer mit slawischem Ursprung aufgrund einer nur unzureichenden Adaptation an die südamerikanischen *Toxoplasma*-Stämme häufiger eine Augentoxoplasmose entwickeln als die Ureinwohner.

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Efficacy of Octenidine against *Leishmania* spp.

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Leishmania spp., transmitted by female sandflies, are the causative agents of visceral and cutaneous leishmaniasis [1]. Although systemic and topical treatments are available, leishmaniasis remains notoriously difficult to treat. Octenidine (OCT) is a commonly used and well-tolerated wound antiseptic, which is known to be effective against *Trichomonas* [2]. This study aimed to evaluate for the first time the efficacy of OCT against *Leishmania donovani in vitro*. Tests were performed in a microtiter system at 22°C, using the clinically available pharmaceutical product (octenisept®, Schülke & Mayr GmbH, Austria; 100µg/ml) and three dilutions of OCT (40µg/ml, 20µg/ml, 10µg/ml) to determine dose-respond curves of the active ingredient. Efficacies were evaluated after three determined incubation periods (5min, 15min, 30min). octenisept® was shown to be highly effective against *Leishmania donovani* and totally inactivated 99% of the *Leishmania* cells within 30 min. Even lower doses of OCT (10µg/ml) effectively inactivated 55% of the cells within 30 min. In summary, OCT seems to be a very promising candidate for the topical treatment of cutaneous leishmaniasis.

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Selected parasites in the small intestine of red foxes (*Vulpes vulpes*) originating from the provinces Tyrol and Vorarlberg

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Introduction
Red foxes (*Vulpes vulpes*) in Austria act as a reservoir for several endoparasites partly with zoonotical potential (3,4). In the last decades the population of this carnivore increased due to the eradication of rabies in Austria. There is also a change regarding habitats as foxes are living more closer to urban and periurban areas as in the past. The direct neighbourhood to humans and domestic animals implies a higher risk of transmitting parasites between different hosts and species.

Material and methodes
Within a prevalence study on *Echinoccocus multilocularis* in foxes from Tyrol (T) and Vorarlberg (V) we investigated the occurrence of certain endoparasites. During the hunting seasons 2013-2016 873 foxes of difference age (juvenile, adult) and sex were sent for post mortem to the Institute for Veterinary Disease Control in Innsbruck (AGES). Under biosecurity measures the small intestine was removed and frozen by minus 80 degrees Celsius for minimum two weeks. After thawing the small intestine was investigated by macroscopy and microscopy for the presence of nematodes (*Uncinaria stenocephala*, Askarididae), cestodes (*Mesocestoides* spp., *Taenia* spp.) and trematodes (*Alaria alata*). The classification of parasites found was accomplished by morphological characteristics. No further species differentiation took place.

Results
No significant difference could be observed concerning in gender. Juvenile animals had significant higher parasite burden than adults. The most frequent parasite observed was *Mesocestoides* spp. with 38% (T=40%; V=36%). Askarididae could be detected in 35% of examined animals (T=35%, V=36%). *Uncinaria stenocephala* (T=11%, V=17%) and *Taenia* spp. (T=7%, V=18%) was found in 14% of investigated individuals. *Alaria alata* could not be detected in a single animal.

Discussion
Regarding foxes from Western Austria there is only a single report in the literature about findings of parasitic species similar to our study (5). *Uncinaria stenocephala* is mentioned as the most common parasite in foxes (1). In our investigation *Mesocestoides* spp. was predominant. No explanation could be found for the higher prevalence in *Taenia* spp. in Vorarlberg compared to Tyrol. In comparison to Eastern and Southern geographical areas (2) our results demonstrate that *Aaria alata* is not a common parasite in Tyrol and Vorarlberg.

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A novel snapback method for simultaneously detection and subtyping of *Plasmodium ovale curtisi* and *Plasmodium ovale wallikeri*

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Plasmodium ovale is one of the six species of apicomplexan parasites belonging to the genus *Plasmodium* and causing disease in humans. A recent phylogeny study has accurately placed both *Plasmodium ovale* species (*P. o. curtisi* and *P. o. wallikeri)* within the *Plasmodium* phylogeny as two sympatric occurring species. The actual prevalence and clinical relevance of *P. ovale* is likely underestimated due to the fact that they often occur in mixed infections with other malaria parasite species in low-level parasitemia, and to the reduced ability to detect *P. ovale* with malaria Rapid Diagnostic Tests (RDTs) [1, 2].
The developed High Resolution Melting (HRM) assay is targeting the apicoplast genome and remains very specific to both *P. ovale* species. Adding a snapback tail at the 5' end of the design forward primer for a nested HRM PCR run, was drastically increasing the method accuracy and precision. This method is an added value to the WHO open request of developing new practical malaria diagnostic methods for the malaria elimination program.

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Tick screening on military training sites in Austria

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Ticks are the most relevant vectors of pathogens in Austria. As military training is conducted primarily in the field, tick exposure cannot be prevented entirely. An evidence-based medical risk management is crucial to establish adequate preventive measures. The goal of this study was to collect baseline data for a follow-on risk assessment for various training activities in different seasons at the training sites.
Ticks were collected from all 54 training sites in Austria. Until now, more than 7.100 ticks have been collected by flagging. On two sites (Korneuburg and Leobendorf) ticks were sampled on a weekly basis to track the tick activity during three years. This revealed the expected peaks of *Ixodes ricinus* activity in spring and autumn. Moreover, in the year 2013, the effects of flooding were monitored in Korneuburg. The tick activity in the following autumn was reduced, rising again during the next years. Also an increased number of *Dermacentor reticulatus* ticks was observed in the years after the flooding and cumulated in a *Dermacentor reticulatus* ratio of 83% of all collected ticks in October 2016 in the floodplain area of Korneuburg. The second location Leobendorf was selected to observe tick activity at a site not impacted by flooding. In Leobendorf, the collection rate (ticks/hour) was generally 4 to 10 times higher than in Korneuburg. This indicates a long-term negative effect of flooding on tick activity in the nearby Korneuburg area with regular occurring flooding events. At both sites, *Haemaphysalis concinna* was collected in low numbers during the summer month, when the *Ixodes ricinus* and *Dermacentor reticulatus* activities were reduced. Besides *Ixodes ricinus* (Korneuburg 79%, Leobendorf 94%), *Dermacentor reticulatus* (Korneuburg 15%, Leobendorf 0%) and *Haemaphysalis concinna* (Korneuburg 6%, Leobendorf 6%) no other tick species were found. *Dermacentor reticulatus* ticks were only found in the Korneuburg floodplain area.

Evaluation of different disinfection approaches against *Acanthamoeba* trophozoites and cysts

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Acanthamoeba are ubiquitous occurring organisms and opportunistic parasites. They are the causative agents in different severe infections such as *Acanthamoeba* keratitis, which is a sight threatening infection of the eye that is mainly linked to the use of contact lenses. In immunocompromised patients they also can induce the almost always fatal granulomatous amoebic encephalitis. The severity of these and other diseases and the difficulty in treatment is due to the resilience of the dormant and metabolically inactive cysts that *Acanthamoeba* forms in the host tissue. As a result, high reinfection rates occur and long and complicated treatment regimens are required.
Little is known about the effect of disinfectants against *Acanthamoeba* cysts. The aim of this study was to evaluate the efficacy of different types of disinfectants used for hand, surface and wound antisepsis against trophozoites and cysts of *Acanthamoeba* in order to provide a first overview of the subject.
A potentially pathogenic *Acanthamoeba* genotype T4 strain which was isolated from an AK patient in 2000 [1] was tested in a microtiter system against eleven different antimicrobial agents on the basis of quaternary ammonium compounds, octenidine, polyhexanide, peracetic acid, active oxygen and different alcohols (phenoxyethanol, ethanol, propanol) in concentrations, routinely used in health care facilities. Respectively, tests were conducted against both, trophozoites and cysts. The efficacies were quantified after one, five and ten minutes by morphological criteria as seen in a hemocytometer in light microscopy. As an addition to the morphological analysis, exposed cysts were also re-introduced to culture plates for viability assessment by monitoring excystment and culture growth. All tests were performed twice in triplicates.
All disinfectants were effective against trophoizoites, with hand disinfectants based on ethanol or propanol generally showing lower efficacy and consequently, the latter ones were not further evaluated against cysts A total efficacy after one minute of exposure against cysts was achieved only by products based on quaternary ammonium compounds, polyhexanide as well as octenidine. If incubated for ten minutes, a peracetic acid-containing disinfectant also showed 100 percent effectivity against cysts, whereas active oxygen and phenoxyethanol were not effective.

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Teledermatologie in den Tropen - Vision und Wirklichkeit

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In den meisten tropischen Gebieten der Erde mangelt es an suffizienter flächendeckender dermatologischer Versorgung. Teledermatologie, die Übertragung von klinischen und histopathologischen Bildern zum Zweck der Diagnostik und Therapieplanung, bietet Chancen Verbesserung zu schaffen.
Die rasante Entwicklung in der Telekommunikation mit computerfähigen Mobiltelefonen und hoher Bildqualität, sowie hoher Geschwindigkeit der Datenübertragung vielen Regionen der Welt birgt bedeutendes Potential zur schnelleren und effizienten Betreuung von Patienten, die bisher keinen Zugang zu dermatologischer Betreuung hatten. Bisher wird das SAF (store and forward) oder asynchrone System der Telemedizin am häufigsten verwendet: transferierte Bilder und Daten werden mit einer gewissen Latenz von Spezialisten begutachtet und dann dem Fragenden Eindrücke und Empfehlungen rückübermittelt.
Bisher gibt es viele kleinere Initiativen und Projekte, so z.B. Internet-Plattformen für Dermatologen in Nepal, Kamerun, Kenia und Tansania, und ein erfolgreiches Netzwerk: „The African Teledermatology Project“ gegründet an der Dermatologischen Abteilung der MedUni Graz. Hautärzte diskutieren mit Nichtfachärzten aus Afrika über Hauterkrankungen und haben dazu ein Advisory Board gegründet. (http://Africa.telederm.org). Die häufigsten Diagnosen von 2007 bis 2015 waren allerdings keine tropischen Dermatosen, sondern Arzneimittelexantheme, Atopische Dermatitis, Ekzeme, Pyodermien und HIV-assoziierte Erkrankungen. Für diese Diagnosen wurde Unterrichtsmaterial verfasst und online gestellt.
Recht intensiv genutzt wird auch eine dermatologische WhatsApp Gruppe in Malawi, der auch niederländische und österreichische DermatologInnen angehören.
Untersuchungen zufolge stimmen ca. 80% der Diagnosen mit der Face - to - Face Diagnose überein. Teledermatologie kann die persönliche Konsultation und den Tastbefund nur ergänzen und die direkte medizinische Arzt–Patientenbeziehung nicht ersetzen.

Tropenreisende können von teledermatologischen Netzwerken profitieren, weil sie die Unterscheidung weltweit vorkommender häufiger Hautkrankheiten (Arthropodenstiche, Pyodermien, Allergien, Sonnenbrand) von Tropenkrankheiten (Schistosomiasis, Tungiasis, Myiasis, Dengue, Chikungunya, Rickettsiosen) auch für weniger Geübte erleichtern und Diagnosestellung und Beginn der richtigen Behandlung wesentlich beschleunigen kann.
Bisher bestehen diese Netzwerke unentgeltlich. Neben der finanziellen Abgeltung sind viele Fragen, wie Gewährleistung, Datenschutz, interkulturelle und legale Rahmenbedingungen und vieles mehr, offen.

Die Vision wäre eine weltweite online-Versorgung rund um die Uhr: mit tropendermatologisch bestens geschulten Ärzten, die ohne Sprachbarriere online Probleme mit Patienten und dem vor Ort befindlichen medizinischen Personal besprechen, optimalerweise in Echtzeit-Verbindung mit einer Apotheke, um die richtigen Medikamente auszusuchen.
In diesem Vortrag werden neben der Vorstellung bestehender Projekte mit ihren Schwächen und Stärken auch die 4 häufigsten Tropendermatosen (Schistosomiasis, Leishmaniose, Myiasis und Tungiasis) bei Reiserückkehrern, die Sie auch im Rahmen einer telemedizinischen Konsultation betreffen könnten, besprochen.

Literatur

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