45. Jahrestagung der Österreichischen Gesellschaft für Tropenmedizin und Parasitologie

45. Annual Meeting of the Austrian Society of Tropical Medicine and Parasitology

From Bugs to Drugs

Programm
Programme

ÖGTP

Kurzfassungen
Abstracts

Gesellschaft der Ärzte, Wien/Vienna
17. – 19. November 2011

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45th Annual Meeting of the Austrian Society of Tropical Medicine and Parasitology

From Bugs to Drugs

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THURSDAY, NOVEMBER 17th

08.30 – 09.30 Entrance into the Billrothhaus and registration

09.30 – 09.40 **WELCOME ADDRESS**
Franz KAINBERGER (President of the Gesellschaft der Ärzte in Wien)
Ursula WIEDERMANN-SCHMIDT (President of the ÖGTP)

09.40 – 11.15 **COMPARATIVE MEDICINE / IMMUNOLOGY OF INFECTIONS**
Chair: Ursula WIEDERMANN-SCHMIDT & Erika JENSEN-JAROLIM

09.40 – 10.10 **PLENARY LECTURE**
Erika JENSEN-JAROLIM (Messerli Institute of the Medical and Veterinary Medical Universities Vienna):
Comparative Medicine to speed up drug development

10.10 – 10.30 **Mathias MÜLLER:** Animal Models in Biomedical Research

10.30 – 10.50 **Armin SAALMÜLLER**: Porcine lymphocyte subpopulations - swine is not a big mouse

10.50 – 11.00 **Marlene WEICHSELBAUMER**, M. WILLMANN, M. REIFINGER, J. SINGER, E. BAJNA, Y. SOBANOV, D. MECHTERIAKOVA, E. SELZER, J.G. THALHAMMER, R. KAMMERER, E. JENSEN-JAROLIM: Carcinoembryonic antigen: Challenging biomarker in comparative medicine

11.00 – 11.10 **Josef SINGER**, M. WEICHSELBAUMER, T. STOCKNER, D. MECHTCHERIAKOVA, Y. SOBANOV, E. BAJNA, F. WRBA, R. HORVAT, J.G. THALHAMMER, M. WILLMANN, E. JENSEN-JAROLIM: Comparative oncology: ErbB-1 and ErbB-2 as promising targets due to striking homology in canine and human cancer.

11.15 – 11.45 *Coffee break*

11.45 – 12.45 **HOST-PARASITE INTERACTIONS**
Chair: Irma SCHABUSSOVA & Hanna L. WORLICZEK

11.45 – 12.00 **Dietmar HAMEL**, C. SILAGHI, K. PFISTER: Vector-borne infections in pet dogs from Eastern Europe

12.00 – 12.15 **Lukas SCHWARZ**, A. JOACHIM, M. SCHLEPERS, S. GABNER, H.L. WORLICZEK: The influence of maternal antibodies on neonatal porcine coccidosis

12.15 – 12.30 **Georg DUSCHER**, M. LESCHNIK: Overwintering capacity of the Mediterranean tick *R. sanguineus* in Austria under outdoor conditions

12.30 – 12.45 **Anneliese MÜLLER***, M. WAGNER, J. WALOCHNIK, S. SCHMITZ-ESSER: Interaction of *Listeria monocytogenes* with free-living amoebae

12.45 – 13.45 *Lunch break*

13.45 – 15.30 **MOLECULAR PARASITOLOGY**
Chair: Julia WALOCHNIK & Michael DUCHÊNE

13.45 – 14.30 **PLENARY LECTURE**
Reto BRUN (Swiss Tropical and Public Health Institute, Basel): Drug Development for Protozoan Parasites

14.30 – 14.45 **Katja SILBERMAYR**, F. LI, S. MÜLLER, A. SOUDRÉ, J. ÖLKNER: Comparative studies on the prevalence of African animal trypanosomiasis in Burkina Faso using conventional and quantitive real-time PCR

14.45 – 15.00 **Simone GABNER**, K. WITTER, S. KOGER, A. JOACHIM, H.L. WORLICZEK: New insights in the local immune response to *Isospora suis*

15.00 – 15.15 K. PASCHINGER, A. HYKOLLARI, E. RAZZAZI-FAZELI, P. GREENWELL, D. LEITSCH, J. WALOCHNIK, **Iain B. WILSON**: Strain-specific modifications of the N-linked oligosaccharides of *Trichomonas vaginalis*

15.15 – 15.30 **Sarah SCHLOSSER***, D. LEITSCH, M. DUCHÊNE: Identification of potential thioredoxin target proteins in *Entamoeba histolytica* using Trx-affinity chromatography

15.30 – 16.00 *Coffee break*

16.00 – 17.45 **DIAGNOSTIK VON INFEKTIONEN: KLINIK vs. LABOR (Symposium von INSTAND/WHO und ÖQUASTA – in German language)**
Chair: Klaus JANITSCHKE & Horst ASPÖCK

16.00 – 16.15 **Annette KAPAUN (Heidelberg)**: Echinokokkose-Diagnostik – Klinik und Labor

16.15 – 16.30 **Herbert AUER (Wien)**: Echinokokkose. Diagnostik aus der Sicht der Parasitologie

16.30 – 16.45 **Patrick SCHEID (Koblenz)**: Telemedizin in der Diagnostik von Parasitosen

16.45 – 17.00 **Julia WALOCHNIK (Wien)**: Diagnostik von Infektionen mit Darmprotozoen

17.00 – 17.15 **Ralf BIALEK (Kiel)**: Diagnostik endemischer Systemmykosen

17.15 – 17.30 **Ilse JEKEL (Salzburg)**: Abenteuer Diagnostik: Geburt, Tod, Immunsuppression und trotzdem nur 2 Parasiten

18.00 **GENERALVERSAMMLUNG für Mitglieder der ÖGTP**
GENERAL ASSEMBLY (members of the ÖGTP only)

in the meantime/afterwards chance to visit the Christmas Village (Weihnachtsdorf) at Altes AKH Universitätscampus (Alserstraße/Spitalgasse)

FRIDAY, NOVEMBER 18th

08.30 – 09.00 Entrance into the Billrothhaus and registration

09.00 – 11.00 **MIGRATION MEDICINE**
Chair: Ursula WIEDERMANN-SCHMIDT & Stefan WINKLER

09.00 – 09.45 **PLENARY LECTURE**
Gerd BURCHARD (Bernhard Nocht Institute for Tropical Medicine, Hamburg):
Migrant health: what is the role of the tropical medicine specialist?

09.45 – 10.00 **Michael BINDER**: Dermatology and migration
10.00 – 10.15 **Hermann LAFERL**: Hepatitis and migration
10.15 – 10.30 **Rudolf RUMETSHOFER**: Tuberculosis and migration
10.30 – 10.45 **Ruth KUTALEK**: "Diversity Medicine": Social and cultural competence at the Medical University Vienna
10.45 – 11.00 **Maria KITCHEN**, M. JÖCHL, S. GOGL, M. GEIT, A. STEUER, A.RIEGER, N. TAYLOR, B. HAAS, M. KANATSCHNIG, M. SARCLETTI, R. ZANGERLE for the AHIVCOS Study Group: HIV-infected immigrants from HIV high- prevalence countries to Austria are diagnosed later, treated less successfully, and lost to follow-up more frequently than Austrian HIV-positive patients

11.00 – 11.30 *Coffee break*

11.30 – 13.00 **EPIDEMIOLOGY/IMMUNOLOGY/VACCINOLOGY**
Chair: Angelika WAGNER & Harald NOEDL

11.30 – 11.45 **Maria PAULKE-KORINEK**, I. ZWAZL, B. SCHMIDLE-LOSS, A. POSTL, M. KUNDI, H. KOLLARITSCH: Rotavirus Gastroenteritis in Hospitalized Children in Austria 2010: Sustained Low Hospitalization Rates and Herd Immunity
11.45 – 12.00 **Wolfgang POEPPL**, H. BURGMANN, K. HOLLOS, T. PUSTELNIK, H. AUER, J. WALOCHNIK, A. FAAS, G. MOOSEDER: Chronic Leishmania Infections in Asymptomatic Individuals in Austria
12.00 – 12.15 **Hans-Peter FUEHRER*,** V. E. HABLER, K. BUCZOLICH, J. HARL, M.A. FALLY, I. BLÖSCHL, P. STARZENGRUBER, P. SWOBODA, J. MATT, W.A. KHAN, J. WALOCHNIK, H. NOEDL: Molecular epidemiology of Malaria in South-Eastern Bangladesh with a focus on *P. ovale curtisi* and *P. ovale wallikeri*
12.15 – 12.30 **Angelika WAGNER**, I. SCHABUSSOVA, O. UL-HAQ, B. RUTTKOWSKI, A. JOACHIM, U. WIEDERMANN-SCHMIDT: Immunomodulation of allergic immune responses by *Toxoplasma gondii* derived antigens
12.30 – 12.45 **Irma SCHABUSSOVA**, O. UL-HAQ, G. LOUPAL, A. JOACHIM, B. RUTTKOWSKI, U. WIEDERMANN-SCHMIDT: *Oesophagostomum dentatum* extracts induce regulatory responses and suppress allergic responses in mice

12.45 – 13.00 **Erika GARNER-SPITZER***, A. WAGNER, M. PAULKE-KORINEK, H. KOLLARITSCH, F. X. HEINZ, G. F. FISCHER, M. KUNDI, U. WIEDERMANN-SCHMIDT: Immunological explanations for vaccination failures - an investigation with Hepatitis B and Tick Borne Encephalitis (TBE) non-responders

13.00 – 14.00 *Lunch break*

14.00 – 15.15 **guided POSTERSESSION I** (at the Foyer) related to the topics **PARASITOLOGY** and **MOLECULAR PARASITOLOGY**
Chair: Christoph HÖRWEG & Anja JOACHIM

PAR 01 **Andreas R. HASSL**: Migration in the Middle Ages: Parasite stages in monasterial latrine pits

PAR 02 **Timo BAUMANN***, H.-P. FUEHRER, J. RIEDL, M. TREIBER, P. IGEL, P. SWOBODA, H. NOEDL: Gastrointestinal Helminth and Protozoa Infections in Muridae and Sciuridae from the Chittagong Hill Tracts in Southeastern Bangladesh

PAR 03 J. RIEDL, **Hans-Peter FUEHRER**, T. BAUMANN, M. TREIBER, P. IGEL, P. SWOBODA, H. NOEDL: Extraintestinal Helminth Infections in Rodents from the Chittagong Hill Tracts in Southeastern Bangladesh

PAR 04 M. TREIBER, **Hans-Peter FUEHRER**, T. BAUMANN, J. RIEDL, P. IGEL, P. SWOBODA, H. NOEDL: Ectoparasites of Rodent Hosts from the Chittagong Hill Tracts in Southeastern Bangladesh

PAR 05 **Petra IGEL***, H.-P. FUEHRER, T. BAUMANN, J. RIEDL, M. TREIBER, P. SWOBODA, H. NOEDL: Ticks, Fleas and Lice in Southeastern Bangladesh

PAR 06 **Elick O. OTACHI**, A.M. MAGANA, F. JIRSA, C. FRANK: Parasites of fish from Lake Naivasha, Kenya: first results

MOLPAR 01 **Johnnie AKGÜN***, I. SCHABUSSOVA, A. WAGNER, A. JOACHIM, B. RUTTKOWSKI, U. WIEDERMANN-SCHMIDT: Parasitic infection and their impact on vaccine responses

MOLPAR 02 **Mirjana DRINIC***, F. ASTELBAUER, H.-P. FUEHRER, P. STARZENGRUBER, M. DUCHÊNE, H. NOEDL, M. SCHULZ, C. WINNIPS, J. WALOCHNIK: Pentamycin shows high anti-protozoal activity *in vitro*

MOLPAR 03 **Michael SYROWATKA***, M. KRANZLER, C. WINNIPS, D. LEITSCH, U. BLÄSI, J. WALOCHNIK: The polyene macrolide drug pentamycin is highly effective against *Trichomonas vaginalis*

MOLPAR 04 **Dzenita HASANACEVIC***, M. BLASCHITZ, S. REHAK, L. MEIDLINGER, A. INDRA, J. WALOCHNIK: Establishment of a reference database for *Legionella* spp., nontuberculous mycobacteria and *Acanthamoeba* spp. using MALDI TOF MS (Matrix Assisted Laser Desorption Ionaisation Time of Flight Mass Spectrometry)

MOLPAR 05 **Simone KURZ***, R. DINGLASAN, I.B.H. WILSON: Cloning, Expression and Characterisation of Glycosyltransferases from the Mosquito *Anopheles gambiae*

MOLPAR 06 **Martina ONDROVICS***, R.B. GASSER, B. RUTTKOWSKI, A.J. NISBET, A. JOACHIM: Transcription profiles for two key gender-specific gene families in *Oesophagostomum dentatum* during development *in vivo* and *in vitro*

MOLPAR 07 **H.L. WORLICZEK**, B. RUTTKOWSKI, A. JOACHIM: Pimp your parasite – fluorescence based imaging of *Isospora suis* in cell cultures

MOLPAR 08 **Miray ÜSTÜNTÜRK**, Z. ZEYBEK, J. WALOCHNIK: Microbial contamination of contact lens storage cases and domestic tap waters

15.15 – 15.30 *Coffee break*

15.30 – 16.15 **guided POSTERSESSION II** (at the Foyer) related to the topics (ETHNO-/CLINICAL TROPICAL-/TRAVEL-) **MEDICINE**
Chair: Peter G. KREMSNER

MED 01 **Lukas HOFFMANN***: Stigma among leprosy patients in Senegal: a disease just like any other?

MED 02 **Alexandra ILLE***: Borrelia relapsing fever – a disease of poverty?

MED 03 **Stefan MILLER***: Ebola in Uganda – Medical Anthropological Aspects

MED 04 D. AKEREY-DIOP, G. MOMBO-NGOMA, P.G. KREMSNER, **Michael RAMHARTER**: Spousal violence and adolescence as risk factors for adverse pregnancy outcome: A questionnaire based survey in Gabon

MED 05 M. CAPAN, S. BÉLARD, G. MOMBO-NGOMA, P.G. KREMSNER, **Michael RAMHARTER**: Epidemiology and Serotype Distribution of Group B Streptococci in Pregnant Women in Gabon, Central Africa

MED 06 **Martin HOENIGL**, T. VALENTIN, H.J.F. SALZER, I. ZOLLNER-SCHWETZ, H. FLICK, R.B. RAGGAM, K. SEEBER, A.J. GRISOLD, R. KRAUSE: Uncomplicated Amebic Liver Abscess in Travellers: Indication for Image-Guided Puncture?

MED 07 **Peter PONGRATZ**, H. LAFERL, G. STRAU, G. STANEK, C. WENISCH: Coughing and fever after surfing in Central America

MED 08 **Andrea SCHNEIDER**, C. PSCHAID, E. SZALAY, S. DOPPLER, F.T. AICHNER, R. PICHLER: Chronic meningo-encephalitis with palsy of the right abducens nerve after journey to Mexico

MED 09 **Michael DUCHÊNE:** Fake Drugs – another kind of worldwide traffic

16.15 – 16.30 *Coffee break*

16.30 – 18.15 **CLINICAL TROPICAL MEDICINE (INCL. MALARIA)**
Chair: Erich SCHMUTZHARD & Walther H. WERNSDORFER

16.30 – 17.15 **PLENARY LECTURE**
Erich SCHMUTZHARD (Medical University Innsbruck, Neurology): Tropical Neurology is not Neurology in resource poor countries

17.15 – 17.30 **Peter STARZENGRUBER**, P. SWOBODA, H.-P. FUEHRER, W.A. KHAN, V. HOFECKER, A. SIEDL, M. FALLY, O. GRAF, P. TEJA-ISAVADHARM, R. HAQUE, P. RINGWALD, H. NOEDL: Artemisinin resistance in Asia. No indication that resistance has reached Bangladesh

17.30 – 17.45 **Lorenz AUER-HACKENBERG***, N. WOREL, S. WINKLER, W. GRANINGER, M. RAMHARTER: Automated erythrocytapheresis in five severe cases of *Plasmodium falciparum* malaria in Vienna

17.45 – 18.00 **Joachim BLOCHER**, A.S. WINKLER, S. GABRIEL, P. WILKINS, H. AUER, P. DORNY, T. GOTWALD, E. SCHMUTZHARD: The value of specific antibody and antigen detection for the diagnosis of neurocysticercosis: A comparison of three tests

18.00 – 18.15 **Arti BASRA**, G. MOMBO-NGOMA, P.G. KREMSNER, M. RAMHARTER: Pilot study on the curative potential of intermittent preventive antimalarial treatment against urogenital bilharziosis in Central Africa. A placebo controlled clinical trial

18.15 **Casting of the ballots for the Junior Award/Poster Prize**

19.00 **EVENING** at the RAHMEN-BILDER-SPIEGEL, Zimmermanngasse 8, 1090 Wien including

19.30 **HANDING OVER OF THE JUNIOR-AWARD** *(sponsored by Pfizer)*
Lecturer with an asterisk * are registered for the „Junior-Award“
HANDING OVER OF THE POSTER-PREIS *(sponsored by Pfizer)*
Poster with an asterisk * are registered for the „Poster-Preis“

20.00 **I.C.U Die Linzer Ärzteband (featuring Martin HADITSCH)**

SATURDAY, NOVEMBER 19th

FORTBILDUNG ÄRZTE / APOTHEKER (in German language)

08.30 – 09.00 Entrance into the Billrothhaus and registration

09.00 – 11.00 **NEUES AUS DEM IMPFWESEN**
Chair: Ursula WIEDERMANN-SCHMIDT

09.00 – 09.30 **Gerhard AIGNER**: Impfaufklärung und Einverständniserklärung
09.30 – 10.00 **Harald FISCHER**: Wie effizient ist die Influenza-Impfung?
10.00 – 10.30 **Karl ZWIAUER**: Pneumokokken im Alter – Jung vs. Alt
10.30 – 11.00 **Ursula WIEDERMANN-SCHMIDT**: Voraussichtliche Änderungen des österreichischen Impfplans für 2012

11.00 – 11.45 *Coffee break (extended)*

11.45 – 14.30 **NEUES AUS DER REISEMEDIZIN** (sponsored by sigma-tau)
Chair: Herwig KOLLARITSCH

11.45 – 12.30 **PLENARY LECTURE**
Peter ODERMATT (Swiss Tropical and Public Health Institute, Basel): Update zu Wurmerkrankungen in SO-Asien

12.30 – 13.00 **Eva JESCHKO**: Konsensuspapier zu Malaria und Malariaprophylaxe

13.15 – 14.30 **REISEMEDIZINISCHE SZENARIEN (QUIZ)** (sponsored by MSD)
Organisation/Moderation: Herwig KOLLARITSCH & Martin HADITSCH

14.30 END

Impfaufklärung und Einverständniserklärung

Gerhard Aigner

Bundesministerium für Gesundheit, Sektion II – Recht und Gesundheitlicher Verbraucherschutz,
Radetzkystraße 2, 1030 Vienna, Austria
E-Mail: gerhard.aigner@bmg.gv.at

Die Einwilligung der Patientin/des Patienten in eine ärztliche Behandlung kann grundsätzlich nur dann rechtswirksam abgegeben werden, wenn über die Bedeutung des medizinischen Eingriffs und seine möglichen Folgen hinreichend und in verständlicher Form aufgeklärt wurde. Erkennt die Patientin/der Patient die Bedeutung des Eingriffes und die Tragweite ihrer/seiner Entscheidung, ist sie/er in der Lage selbstbestimmt zu handeln. Inwieweit die Aufklärung zur Wahrung der Selbstbestimmung im konkreten Einzelfall zu erfolgen hat, ist eine vom Gericht zu beurteilende Rechtsfrage. Grundsätzlich ist dabei über jene Gefahren aufzuklären, die geeignet sind, Einfluss auf die Willensbildung der Patientin/des Patienten zu nehmen. Darunter fallen regelmäßig mit dem Eingriff typischerweise verbundene Risiken oder (auch seltene) Gefahren, die schwere Folgen nach sich ziehen können.

Wesentliches Kriterium für die Bestimmung des Umfangs der gebotenen Aufklärung ist die Dringlichkeit sowohl in zeitlicher als auch in sachlicher Hinsicht. Dabei verhalten sich der Umfang der Aufklärungspflicht und die Notwendigkeit bzw. Dringlichkeit des Eingriffs umgekehrt proportional: die Aufklärung hat umso umfassender zu sein, je weniger dringlich der Eingriff und je größer die Wahrscheinlichkeit einer Schädigung ist.

Gegen ihren/seinen Willen darf der Patientin/dem Patienten die ärztliche Aufklärung nicht aufgezwungen werden. Die Patientin/ der Patient kann auf die medizinische Erörterung auch verzichten. Rechtswirksam ist eine Verweigerung der Aufklärung jedoch nur, wenn der Patientin/dem Patient die zugrundeliegenden Risiken grundsätzlich bekannt sind.

Das persönliche Gespräch bildet einen wesentlichen Bestandteil der ärztlichen Aufklärung. Obwohl eine schriftliche Information das Aufklärungsgespräch nicht ersetzen kann, ergibt sich aus den dadurch erworbenen Vorkenntnissen eine Einschränkung der Aufklärungspflicht. Dies setzt allerdings voraus, dass die Patientin/der Patient die schriftliche Risikoaufklärung verstanden hat.

Ein Verzicht auf mündliche Aufklärung ist möglich, dem Patienten muss allerdings bewusst sein, dass ihm an sich ein Recht auf mündliche Aufklärung zusteht. Als Basis für einen etwaigen Verzicht auf mündliche Aufklärung hat das BMG in verschiedenen Sprachen ausführliche Informationen erstellt.

Spousal violence and adolescence as risk factors for adverse pregnancy outcome: A questionnaire based survey in Gabon.

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Spousal violence has been associated with deleterious birth outcome. Additionally it was shown that adolescence is an independent risk factor for adverse birth outcome. Since both – spousal violence and adolescence pregnancy – is prevalent in the central African country of Gabon, we aimed to investigate in this questionnaire based survey 1) the occurrence and the forms of intra-marital violence, 2) the primary reasons for spousal violence, and 3) in which way adolescence is associated with the occurrence of spousal violence. In this preliminary analysis we report on the first 110 interviews and implications for further research and preventive strategies are discussed.

Parasitic infection and their impact on vaccine responses

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The capacities of parasites to modulate the immune response of their hosts are well described. The goal of the project is to evaluate if certain parasitic infections influence the immune responsiveness/efficacy of vaccines and vice versa. Therefore, mice were infected with *Toxoplasma gondii* and immunised either with an oral vaccine (cholera toxin) or a systemic vaccine (diphtheria toxoid) during the acute or chronic phase of infection.
The preliminary data show a boost of all antibody subclasses in sera and gut lavages of infected and vaccinated mice compared to only vaccinated mice. Furthermore, we observed that splenocytes, mesenteric lymphocytes and lung cells from infected and vaccinated mice restimulated *in vitro* with cholera toxin or diphtheria toxoid show altered cytokine levels, i.e. increased (IL-6 and IL-10) and decreased (IL-5 and IFNγ) in comparison to cells cultures derived from animals which were only vaccinated.
Additionally, after systemic immunisation the number of *T. gondii* DNA copies in the brain of *T. gondii* infected mice was reduced by 50 % compared to unvaccinated *T. gondii* infected mice. The underlying mechanism of the reduced brain cysts are currently under investigation.
Our preliminary data demonstrate that *T. gondii* not only has a strong impact on vaccine responses but that vaccination reduces severeness of infection in terms of reduced brain cysts of the parasite.
Similarly, vaccine responsiveness during a helminth infection with *Trichuris muris* will be evaluated. Our final goal is to identify the influence and underlying immunological pathways of parasitic (co)infections on vaccine responsiveness as well as of the course of infection.

Echinokokkose. Diagnostik aus der Sicht der Parasitologie

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Infektionen des Menschen mit *Echinococcus multilocularis* (Fünfgliedriger Fuchsbandwurm) und *E. granulosus* (Dreigliedriger Hundebandwurm) werden in Österreich regelmäßig beobachtet, diagnostiziert und therapiert, wobei *E. multilocularis*-Infektionen meist autochthon erworben wurden, *E. granulosus*-Infektionen werden vornehmlich in anderen Ländern (z. B. im Mittelmeergebiet) akquiriert.
Die laboratoriumsdiagnostische Abklärung von klinisch manifesten, aber auch von subklinisch oder manchmal sogar klinisch völlig unauffällig verlaufenden *Echinococcus*-Infektionen basiert heute – nach der Erstellung einer Verdachtsdiagnose aufgrund klinischer, anamnestischer, blutchemischer und/oder „radiologischer" Untersuchungen – einerseits auf dem Nachweis spezifischer Antikörper, andererseits auf dem Nachweis von Häkchen, Protoscoleces, Laminarschicht- und Keimschichtgewebe oder spezifischer DNS aus Operationsmaterial mittels parasitologisch-histologischer oder parasitologisch-molekulargenetischer Untersuchungen.
Von großer Bedeutung dabei ist die Auswahl des notwendigen diagnostischen Testinstrumentariums, das ein hohes Maß an Sensitivität und Spezifität haben muss, um einerseits möglichst alle Echinococcus-Infektionen zu „erkennen", und andererseits falsch-positive Ergebnisse bzw. Befunde auszuschließen. Von allergrößter Bedeutung ist aber eine jahre- bzw. sogar jahrzehntelange Expertise in der Laboratoriumsdiagnostik der Echinokokkosen. Dies wird anhand einiger Kasuistiken untermauert.

Automated erythrocytapheresis in five severe cases of *Plasmodium falciparum* malaria in Vienna: A case study

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Despite the administration of antimalarial treatment severe malaria still leads to high mortality. Since overall survival is associated with total parasite biomass and its effective reduction, blood exchange transfusion had been proposed as a potential method to rapidly reduce peripheral parasitaemia. However, current evidence suggests that this treatment modality has deleterious consequences due to derangement of fluid homeostasis. Automated erythrocyte apheresis has been advocated as an alternative method of physical parasite removal, with the potential benefit of causing only minimal volume alterations and marginal hemodynamic distress. Since 2001 five adults with severe malaria were treatment with adjunct erythrocytapheresis out of a total of more than 200 hospitalized patients who were treated at our institution. Here we report the clinical and parasitological characteristics of these patients and discuss advantages and potential challenges of erythrocyte apheresis in the treatment of severe malaria.

Pilot study on the curative potential of intermittent preventive antimalarial treatment against urogenital bilharziosis in Central Africa. A placebo controlled clinical trial.

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Schistosomiasis is among the most prevalent parasitic diseases in tropical Africa. Whereas schoolchildren often present with symptomatic disease, adults – including pregnant women – may report only few clinical symptoms despite considerable signs of inflammation. Whereas routine preventive treatment of malaria is the standard of care for pregnant women in many parts of tropical Africa, Schistosomiasis detection and treatment is often neglected. In this pilot study we aimed to investigate the curative potential of mefloquine – a second generation preventive antimalarial treatment in pregnant women – against *Schistosoma haematobium* infection. We report on preliminary findings of this placebo controlled clinical trial at the Albert Schweitzer Hospital in Lambaréné, Gabon.

Gastrointestinal Helminth and Protozoa Infections in Muridae and Sciuridae from the Chittagong Hill Tracts in Southeastern Bangladesh

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Rodents are a key mammalian group highly successful in adapting to a variety of environments throughout the world and play an important role in many zoonotic cycles. Within this project the gastrointestinal parasite fauna of more than 75 rodents (Muridae and Sciuridae) was determined in the District of Bandarban (Chittagong Hill Tracts) in Southeastern Bangladesh primarily. Rodents were collected from the semi-urban area in Bandarban town itself and rural villages within the District and classified to species level. Gastrointestinal parasites were examined with macro- and microscopical tools (e.g. Ziehl-Neelsen Staining) at the MARIB field site in Bandarban. A large variety of intestinal parasites were found in rodent hosts: Protozoa, Trematoda, Cestoda, Nematoda and Acanthocephala.

Diagnostik endemischer Systemmykosen

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Dermatology and migration

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The value of specific antibody and antigen detection for the diagnosis of neurocysticercosis: A comparison of three tests

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Neurocysticercosis (NCC) is a major cause of epilepsy in endemic areas. The diagnosis of neurocysticercosis is based upon neuroimaging and supported by the detection of specific antibodies or *Taenia solium* antigens in blood or CSF. However, in many areas neuroimaging is not available and serological tests are not sufficiently evaluated. In the current study, we compare two antibody tests and one antigen ELISA in people with epilepsy (PWE) with each other and with results from cerebral computertomographic (cCT) scans.

83 serum samples of PWE living in northern Tanzania (28 with definite or highly suggestive NCC lesions on cCT, 7 with compatible and 48 without NCC lesions) and 11 CSF samples of PWE with definite or highly suggestive NCC lesions in cCT were analysed with the electroimmunotransferblot (EITB), the current reference test developed by the Centers for Disease Control and Prevention, Atlanta, and an antigen (Ag) ELISA developed by the Institute of Tropical Medicine Antwerp. Twenty sera with lesions highly suggestive or definite NCC and 20 without NCC lesions were analysed with a commercial Western blot (CWB; LdBio, France).

Taking CT as a gold standard, the CWB was seemingly more specific (0/6 CWB vs. 4/46 EITB positive without NCC lesions on cCT) but less sensitive (McNemar, $p=0.02$) than the EITB, especially in patients with only calcified lesion (positive: 2/15 vs. 11/23). The number of lesions (Mann-Whitney-U, CWB: $p<0.01$, CDC EITB: $p<0.01$, Ag-ELISA: $p<0.01$) and active NCC lesions (Fisher's exact test: EITB: $p=0.02$; CWB: $p<0.01$, Ag-ELISA: $p<0.01$) were significantly associated with a positive antibody result in both antibody tests. The antigen ELISA was less useful for the diagnosis of NCC in general (ROC: optimal sensitivity 0.53 and specificity 0.71), than for the diagnosis of active NCC (ROC: optimal sensitivity 1.0 and specificity 0.84). Analysing CSF, all samples of patients with active NCC (n=4) were positive in all three tests. Antibodies were detected in 1/7 samples with inactive NCC lesions and antigens in 0/7 samples.

There are only anectodal reports of false positive results of the EITB and NCC might have been missed in the cCT, thus, the lower specificity of the EITB has to be interpreted with care. Analysing serum can only confirm an infection or contact but not a neurological involvement. In summary, serological tests are useful but cannot replace neuroimaging in the diagnosis of NCC.

Drug development for protozoan parasites

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Tropical diseases are still posing a significant threat to human health mainly in developing countries. Malaria, forming together with HIV/AIDS and tuberculosis the 'big three' of infectious diseases, is responsible for some 250 Million malaria episodes and over 800'000 deaths annually[1]. Other important diseases caused by protozoan parasites are human African trypanosomiasis (sleeping sickness), Chagas disease and visceral leishmaniasis. All three diseases are potentially fatal and cause approximately 100'000 deaths annually. The drugs available for these diseases are mostly old, lack efficacy or lost efficacy due to drug resistance, show side effects and require long or complicated treatment[2,3]. There is an urgent need for new safe, effective and affordable medications.

Ten years ago the WHO, not-for-profit and philanthropic organizations initiated product-development-partnerships (PDPs), such as the Medicines for Malaria Venture foundation (MMV) or the Drugs for Neglected Diseases initiative (DNDi). Bringing together partners from academic and governmental institutions, as well as biotech and pharma companies, a new model of R&D for new drugs was established. At the Swiss Tropical and Public Health Institute a Screening Centre for protozoan parasites is operating which collaborates with such PDPs and many consortia consisting of academic groups and industrial partners. Research endeavours during the last 10 years resulted in several clinical candidates that are in clinical studies or will soon enter phase I trials: For malaria two new clinical candidates were recently selected, the spiroindolone NITD609[4] and the synthetic peroxide OZ439[5]. For human African trypanosomiasis (sleeping sickness) the nitroimidazole fexinidazole[6] entered phase II clinical trials while other chemical classes i.e. aromatic diamidines[7] or benzoxaboroles[7] are in the pipeline as back-up molecules.

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Migrant health:
What is the role for the tropical medicine specialist

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Trends in international population movements are globalization, acceleration of migration, differentiation of migration (temporary workers, refugees, asylum seekers, etc.), feminization. There is an increasing heterogeneity of migrants coming to Europe with more and more refugees coming from tropial and subtropical areas.

Diseases of migrants include:
- pre-departure existing medical conditions
- health impacts during migration
- and health impacts arising after arrival.

Tropical medicine specialists are needed to manage these problems.

Pre-departure existing medical conditions include metabolic and genetic diseases like Familial Mediterranean fever, but of course migrant populations also have a critical role in the spread of infectious diseases. Infectious diseases in migrants differ from those seen in travellers: prevalences are different, they may carry rare infectious diseases usually not seen in travellers, the course of infectious diseases may be different due to genetic factors and immunity. Some examples: In many developed countries, TB occurs disproportionately in the foreign-borne population, even foreign-born persons who had lived in the United States for more than 20 years had annual TB case rates of more than 10 per 100 000 persons, which was greater than 4 times the rate among US-born persons in 2006. Also some chronic conditions are associated with remote acquisition of infections such as Chagas disease with chronic cardiomyopathy or gastrointestinal disorders or cysticercosis with seizure disorders. Diseases like pentastomiasis, Buruli ulcer etc are practically never seen in tourists. All these infectious diseases usually are not seen by infectious diseases specialists in Europe – this is the reason why migrants from tropical and subtropical regions should be evaluated by a tropial medicine specialist.

Medical peculiarities of migrants are also caused by the process of migration itself. Refugees are especially affected and often a lot of problems arise already while they are fleeing (Flight is an elemental measure of life and health protection to escape from hunger, torture and war – it is a form of prevention!). Flight means deprivation. Nobody knows how many humans starve and die of thirst on their way through the deserts and how many are drowned on the sea way to Europe. The risk for infectious diseases can be high in overcrowded camps and group quarters. Big additional risks for the refugees may be smuggling, slave trading and compulsory prostitution. Tropical medicine specialists should know about these risks.

Immigrants face problems and barriers in access to healthcare in the recipient countries, partly due to their exotic diseases, partly due to their insecure status, communication problems and different disease concepts.

Migrants may present with conditions unfamiliar to European-trained health care professionals, resulting in delays in diagnosis. Dermatologic conditions are especially challenging. Many examples have been published showing that severe diseases can be overlooked for long time in migrants from tropical areas not presented to a tropical medicine specialist: Patients with leprosy experienced symptoms for a mean of 4,8 years before referal to Tropical Disease Unit in Canada (CMAJ 2004, 170:55); strongyloidiasis frequently is overlooked, in one study hyperinfection occurred in five patients prescribed corticosteroids with two deaths (Am J Med 2007, 120: 545); lack of screening can lead to delayed diagnosis and treatment of serious diseases (J Travel Med 2006, 13:133). All these examples demonstrate the importance of tropical medicine specialists in managing these patients.

On the other hand: Cultural and communication issues also have to be taken into consideration. Each patient has its own ideas and models concerning perception and definition of health and disease. Therefore the behaviour of sick people can differ a lot in different societies. Illness is the personal, social and cultural response to disease. The medical care in Europe is first of all subject to a scientific based medical knowledge, but medical concepts in other cultures are often bound to religious bases, illness may be seen as the work of supernatural power or the continuing influence of dead ancestors. It can be quite difficult to differentiate culture specific symptoms ("… my body is eaten up by a worm…") from specific tropical diseases. This is another reason why these patients should be seen by a tropical medicine specialist. However, this means that tropical disease specialist must have some knowledge about the cultures of their patients!. They do no need to be specialists in social anthropology – but some acquaintance with the medical systems of the countries where their patients come from is helpful.

In summary:
- Tropical medicine services and facilities have to be provided
- Laboratory capacity for rare or exotic diseases has to be sustained
- Continuing education of healthcare providers in global health issues is important
- Competency in international health issues and responses has to be maintained by tropical medicine specialists
- Global health programs in universities and medical/ nursing schools are needed.

Tropical medicine as a discipline of its own (and separated from infectiology) is of greater importance than ever in our globalized world with worldwide population movements.

Epidemiology and Serotype Distribution of Group B Streptococci in Pregnant Women in Gabon, Central Africa

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Only few data exist to describe the impact of GBS-related morbidity and mortality in resource poor countries. Reports from Africa indicate that GBS colonization rates of pregnant women and incidence of invasive disease in their offspring are comparable to industrialized countries. However, in resource poor settings, infrastructure for diagnostics, peripartal chemoprophylaxis and adequate case management is mostly lacking. Preventive strategies such as vaccine development are therefore even more important in resource limited countries. To adapt ongoing vaccine development to needs of resource-limited populations, investigation of the respective epidemiology is a prerequisite. In this cross sectional survey conducted at the Albert Schweitzer Hospital in Lambaréné, Gabon, 97 (19,71%) of 492 examined pregnant women were colonized with GBS. The 76 GBS serotyped so far show a serotype distribution with serotype III being the most prevalent (33%), followed by serotype V (28%), serotype Ib (24%), serotype Ia (8%), serotype II (7%) and serotype VII (1%). For 27 GBS strains antibiotic susceptibility was assessed and no isolate showed resistance nor reduced penicillin susceptibility.

Pentamycin shows high anti-protozoal activity *in vitro*

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Malaria, leishmaniosis, Chagas disease, giardiosis and amoebiosis are responsible for morbidity and mortality, particularly in tropical countries. Many of the available drugs elicit serious adverse reactions and parasite resistance to existing drugs has become a serious problem. The aim of this study was to evaluate the anti-protozoal activity of a newly patented form of the polyene macrolide drug pentamycin, with a chemical purity exceeding 95%. Polyene macrolides are produced by *Streptomyces* spp. and are characterised by large lactone rings, containing three to eight conjugated double bonds that are generally combined with one sugar moiety. They have been reported to interact with membrane sterols. Pentamycin has a broad spectrum of antimicrobial activity, *e.g.* it is effective in various forms of infectious vaginitis as fungal infections, trichomonal infections and co-infections with bacteria.

Standardised axenic cultivation of protozoa is a useful approach for yielding a defined number of parasites for *in vitro* drug testing and for comparison of novel compounds with standard drugs. *Plasmodium falciparum* field isolates were collected (after informed consent) and tested at the Malaria Research Initiative Bandarban field site in south-eastern Bangladesh. *Leishmania infantum*, *Trypanosoma cruzi*, *Giardia intestinalis*, and *Entamoeba histolytica* cultures were set-up in our laboratory in Vienna. The standard drugs dihydroartemisinin for *P. falciparum*, miltefosine for *L. infantum*, amphotericin B for *T. cruzi* and metronidazole for *G. intestinalis* and *E. histolytica* were used for control purposes.

Pentamycin was tested in several previously established microtiter plate systems. Fresh *P. falciparum* isolates were tested in the histidine rich protein 2 (HRP2) *in vitro* drug susceptibility assay. Viability of *L. infantum, T. cruzi, G. intestinalis and E. histolytica* cells was determined after 24, 48 or 72 h treatment with pentamycin and the respective standard drug by staining the cells with trypan blue and quantifying protozoa with Bürker and Bürker-Türk haemocytometers, respectively. Preliminary results show promising high activity of pentamycin against *P. falciparum*, *L. infantum*, *T. cruzi*, *G. intestinalis* and *E. histolytica* compared to standard drugs. As an example, the activity against *G. intestinalis* with an EC_{50} value of 1.2 µg/ml and an EC_{90} value of 2.0 µg/ml after 24 h was quite promising. As there is little absorption of pentamycin into the tissues, it may at this time be particularly well-suited for the treatment of non-invasive microorganisms such as *G. intestinalis*.

Fake drugs – another kind of wordwide traffic

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It started with lifestyle drugs, the classical example of it all was Pfizer´s Viagra (sildenafil). A mass of dubious internet companies wrongly claimed to provide the drug prescription-free, cheap and as a generic medicament. The fake blue pills usually did contain sildenafil, but at higher or lower concentrations or contaminated with impurities. Another approach was the preparation Herba Gra. This is sometimes supposed to be a Bulgarian mixture of herbs, sometimes a mysterious Chinese herbal drug. Its secret is that besides some plant material it contains a normal dose of sildenafil. Users are happy that they have discovered a "natural" preparation, and the danger of taking too much of the drug is high. Other dangerous lifestyle drugs are claiming to help to lose weight or to speed up building muscles and strength.

Of course we are rightly warned to buy and use these drugs, and normally they are not a big temptation. When we look out in the world, there are, however, fake drugs which are much harder to escape. In countries like Nigeria, Cambodia, or Myanmar, drugs are typically sold on markets and malaria patients are faced with a high percentage of fake malaria drugs. In 2008, a large study of Paul Newton and colleagues bought questionable would-be artesunate in several countries of South East Asia, and one half of these samples turned out to contain no or only small quantities of artesunate. In-depth analysis of the counterfeit samples showed that at least a part were manufactured in southeast People's Republic of China. Some traders of these drugs were convicted, but the factory was not found.

Returning to the industrialised countries, the common belief is that the strict controls and clear distribution pathways will prevent such cases. This belief has to be challenged, however, of course there is an influx of sometimes questionable drugs from internet dealers, but there has also been a recent case where drug stores in Germany sold generic cancer therapy medicaments as genuine ones, and last year, as the New York Times reports, there has been a major case where a large drug company has agreed to pay $750 million to settle criminal and civil complaints for having sold drugs of questionable quality that had been produced in Puerto Rico. This shows that this problem needs attention everywhere in this world.

Overwintering capacity of the Mediterranean tick *R. sanguineus* in Austria under outdoor conditions

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In the past the brown dog tick (*Rhipicephalus sanguineus*) sporadically was imported to northern lattidutes and was able to establish indoor population at these locations. These entries of ticks via imports of straying dogs from south or by taking the dogs on vacation to southern areas is still going on. Furthermore the higher travel activity of humans together with their pets suggests an increased transfer of these ticks to Austria. Yet the outdoor climate of Austria was believed to be unsuitable for *R. sanguineus* to establish a permanent population. Especially the winter temperatures were assumed to be the limiting factor for survival of this species in Austria.

To test the surveillance of *R. sanguineus* we stored 200 and 320 engorged nymphs in winter 2009/10 and winter 2010/11, respectively, outdoors and checked their survival and moulting rate monthly. A datalogger was added to measure temperature and humidity in 30 minute intervals.

In winter 2009/10 13% of the nymphs moulted and 4% survived until the spring. Many of these ticks showed deformations and although they were able to attach to host skin, feeding did not occur.

In winter 2010/11 26.6% of the nymphs developed to adults and 19.4% survived the winter. These ticks showed no deformations and were able to feed and lay eggs. Larvae hatched from these eggs.

In conclusion overwinter and survival of engorged *R. sanguineus* nymphs in Austria is possible. In Winter 2009/10 the deformations either indicates inbreed problems, too high humidity or development damages, which could not be cleared until now. In Winter 2010/11 fully fertile ticks developed and survived and these ticks could form a foundation of a potential new population.

Further investigations of other instars – especially larvae and eggs – have to be conducted to draw a picture of the possible integration of a new tick species to the Austrian tick fauna. This gains importance due to fact that this tick acts as vector for several dog and human relevant diseases.

Wie effizient ist die Influenza-Impfung?

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Molecular epidemiology of Malaria in South-Eastern Bangladesh with a focus on *P. ovale curtisi* and *P. ovale wallikeri*

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Malaria remains a major health issue throughout South and Southeast Asia. High standards in the diagnosis of the malaria-causing *Plasmodium* species are essential to control and adequately treat malaria but there is still a lack of information regarding the presence of four out of six human malaria parasites: *Plasmodium ovale wallikeri*, *P. ovale curtisi*, *P. malariae* and *P. knowlesi*.

The molecular epidemiology of these pathogens as well as of the more prevalent species *P. falciparum* and *P. vivax* were investigated within the course of a hospital-based survey and field surveys in Bandarban District in Southeastern Bangladesh between 2007 and 2010. Filter paper samples from 379 patients presenting with symptomatic febrile illnesses and more than 1,800 asymptomatic participants were analyzed using a standardized genus- and species specific nested PCR method, targeting the small subunit ribosomal RNA gene. Samples positive for monoinfections with *P. ovale* spp. were further analyzed by multilocus sequence analysis of 3 loci (SSU rRNA, cox1, porbp2), and the comparison of several different PCR techniques targeting the SSU rRNA and PoTRA genes for their accuracy regarding the diagnosis of *P. ovale* spp. was performed. In the course of this project new PCR primers were designed and tested for its accurate diagnosis of *P. ovale*.

New insights in the local immune response to *Isospora suis*

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Isospora suis, the causative agent of neonatal porcine coccidiosis, leads to considerable economic losses in pig breeding industries worldwide. Little is known about the local immune response to this parasite. Previous studies suggest that especially TcR-γδ$^+$ T cells are involved in the intestinal immune response. To further analyze the influence of an infection on different intestinal T-cell subsets, we compared frozen jejunal samples of *I. suis*-infected piglets (infection on the third day of life) to samples of non-infected control animals. In total, 50 animals of 5 age groups (day of life 7, 9, 12, 15 and 18, respectively) were examined. Fluorescent marked immunohistochemical double staining (CD3/CD8β; CD3/CD25; CD3/TcR-γδ) was evaluated semiquantitatively. We found a significant increase (p=0,005) of cytotoxic T-lymphocytes (CTL) in the intestinal mucosa (epithelium and lamina propria, respectively) of infected animals. Our findings indicate that CTLs are involved in the local immune response to *I. suis*, even though no increase or decrease could be found in other organs for this cell population. This is the first evidence that other cells of the adaptive immune system apart from TcR-γδ$^+$ T cells are involved in the local immune response to *I. suis* in suckling piglets.

Immunological explanations for vaccination failures – an investigation with Hepatitis B and Tick Borne Encephalitis (TBE) non-responders

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Low- or non-responsiveness (NR) affects 1 to 10 % of vaccinees and is defined as the inability to mount a sufficient protective immune response upon primary and/or booster vaccination. The identification of non-responders requires re-immunization to observe whether the existing low titers remain low or can be boostered. In order to investigate antigen-specificity and underlying immunological mechanisms of NR, we performed a study, where TBE low/non-responders, hepatitis B non-responders and TBE high-responders received both TBE- and Influenza vaccination. Humoral and cellular immune parameters were assessed before and 1 week, 2 month and 6 month after the vaccination.
In TBE high-responders already high TBE titers increased and sufficient antibody response to all 3 Influenza strains with highest titer levels 1 week after booster was observed. In TBE non-responders TBE titers remained low while Hepatitis B non-responders reacted adequately to the TBE vaccine. Both NR-groups mounted appropriate antibody titers to the 3 Influenza strains, yet with delayed peak levels 2 months after booster. TBE non-responders showed a positive correlation of humoral and cellular immune response (IR). Low antibody levels and lack of T-cell proliferation to TBE vaccine, along with sufficient humoral and cellular responses to Influenza were observed. Flowcytometric analysis of PBMC revealed that in this group compensatory mechanisms on both T-effector-memory and cytotoxic T-cell level seem to be present upon TBE antigen exposure. Additionally T-regulatory cells were increased after booster vaccination. In contrast, in Hepatitis B non-responders humoral and cellular IR did not correlate. These donors developed protective antibody titers to TBE and Influenza vaccine but showed decreased antigen-specific cellular immune responses: Low *in-vitro* IFN-gamma and IL-2 levels were accompanied by high IL-10 levels, which were already present in un-stimulated PBMC. The described HLA class II subtypes associated with Hepatitis B non-responsiveness could be confirmed and the observed high IL-10 levels seem to be linked to these subtypes. Also in this NR group a significant increase of T-regs after booster was observed.
Our data indicate that non-responsiveness is antigen specific on humoral but not cellular level. Depending on the type of non-responder, different mechanisms seem to govern the interplay of humoral and cellular immune response. The role of the immunosuppressive cytokine IL-10 for vaccine responsiveness and the types of regulatory immune cell populations are being further investigated.

Vector-borne infections in pet dogs from Eastern Europe

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Vector-borne infections in dogs are a topic of major interest in veterinary medicine. As accessible data on such infections is comparably limited for Eastern Europe and novel data primarily derives from the screening of imported (stray) dogs, a total of 52 pet dogs in Veterinary Hospitals in Bucharest (29), Romania, and Kiev (23), Ukraine, present for surgery, follow-up visits or infectious diseases were screened by serological (only dogs from Romania), heamatological (Giemsa-stained blood smears) and molecularbiological methods. The applied screening panel covered the following pathogens: *Babesia* spp. (*B. canis canis*, *B. c. vogeli*, *B. gibsoni*), *Hepatozoon canis*, *Leishmania* spp., *Dirofilaria immitis*, *D. repens*, *Anaplasma phagocytophilum*, *Ehrlichia canis* and *Mykoplasma haemocanis*. 14 dogs were infested with ticks prior to consultation, more than half of the animals were regularly or irregularly treated with ectoparasiticidal formulations.
A total of 23/52 (44.2%) of the dogs were positive for infections in PCR and 5 different pathogens were detected: *B. c. canis* (19x), *H. canis* (1x), *D. immitis* (1x), *D. repens* (2x) and *M. haemocanis* (2x). Polyinfections were observed only in two dogs from the Ukraine (*M. haemocanis*/*H. canis, B. c. canis*/*D. immitis*). Serological screening by IFAT and DiroChek®-ELISA of the Romanian dogs detected antigen of *D. immitis* (1/29) and antibodies against *B. canis* spp. (12/29), *Leishmania* spp. (3/29), *A. phagocytophilum* (5/29) and *E. canis* (1/29). Dogs with known tick infestation were significantly more often infected with vector-borne infections than dogs without recognized tick infestation ($p < 0.05$). There was no difference in infections considering gender. These results show that several infectious agents may be encountered in dogs of this provenance. As tick-borne infections are most prevalent, adequate prophylactic treatment may reduce the risk of an infection. A broader screening apart from "traditional" canine-vector borne pathogens in these countries, e. g. *B. c. canis* or filarial infections, is deemed necessary.

Establishment of a reference database for *Legionella* spp., nontuberculous mycobacteria and *Acanthamoeba* spp. using MALDI TOF MS (Matrix Assisted Laser Desorption Ionisation Time of Flight Mass Spectrometry)

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The genus *Mycobacterium* with more than 100 described species can be subdivided into three groups: *Mycobacterium tuberculosis*, *Mycobacterium leprae* and the non-tuberculosis mycobacteria (NTM), which can provoke potentially lethal lung infections in children or immunocompromised patients.
Mycobacteria are gram-positive, ubiquitous organisms and have been isolated from hospitals, water, humid rooms, soil and from the mucosa of humans and animals.

Legionella spp. are gram-negative, anaerobic, rod-shaped, non-spore forming ubiquitous bacteria, *L. pneumophila* is the causative agent of Legionnaires' disease (Legionellosis). This disease represents 4% of all community-acquired pneumonia cases worldwide and can have a lethal outcome in 18-20% if left untreated.
Due to its ubiquitous occurrence *Legionella* spp. can be isolated from various habitats, like air, soil, ground and surface water, air condition units and swimming pools.

Acanthamoeba spp. are the most common protozoa found in the natural environment, in various habitats all over the world. For example, they have been isolated from air, dust, soil, fresh and tap water, ocean sediment, air-conditioning, contact lenses and contact lens cases, hospitals, dental treatment units, and dialysis machines. The life cycle of these eukaryotes has two stages, a trophozoite and a cyst stage. Under adverse environmental conditions trophozoites form robust cysts which play a significant role as vectors for bacteria (*Mycobacterium* spp. and *Legionella* spp.) and fungi.
Acanthamoeba spp. can provoke severe infections, including *Acanthamoeba* keratitis (AK), GAE (granulomatous amoebic encephalitis), and infections of the lung and the skin.

The aim of the present study was the establishment of a reference database for protein mass spectra of *Legionella* spp., non-tuberculous mycobacteria and *Acanthamoeba* spp. using the MALDI TOF MS and the MALDI Biotyper software identification. To verify the potential of MALDI TOF technology to detect acanthamoebae harbouring *Legionella* spp. as endocytobionts, axenic cultures of *Acanthamoba* spp. were artificially infected with *Legionella* spp.

This reference database is aimed to serve as an essential tool for the identification of *Legionella* spp. and *Acanthamoeba* spp. and furthermore for the detection of *Legionella* spp. in *Acanthamoeba* spp.

Migration in the Middle Ages: Parasite stages in monasterial latrine pits.

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During more recent archeological excavations in abandoned monasteries in Mondsee (Upper Austria) and St. Pölten (Lower Austria) well preserved refuse pits were discovered and unsealed. The black-earthy contents of the pits inclose numerous bones, teeth, fish scales, ceramic shards, charcoal, and parasite stages, especially hard-shelled helminth eggs. In the course of a multidisciplinary processing the onsets and the ends of the pit fillings were chronologically determined by shard classification; preserved traditional local menus of Benedictine monks were implicated in disposal practices of abattoir refuse and kitchen garbage; and defaecation conventions were ascertained by identifying remains of human and animal parasites.

In the case of the former Benedictine monastery in Mondsee the pit was a slurry- and garbage chest used from the second half of the 15th century upwards, in the case of the former Austrian Congregation of Canons Regular abbey in St. Pölten the pit turned out to be a late medieval masoned latrine shaft filled with shards, abattoir refuse, kitchen garbage and excrement. In the excrement of this pit numerous helminth eggs were detected, especially a lot of *Trichuris* eggs. But, the classification of the host species of the whip-worms is challenging, most *Trichuris* eggs found seem either to be of human or of porcine provenance. As pork was seldom eaten by monks and friars till the 18th century, and pig bones are not overrepresented in the abattoir refuse, human infections with *T. trichiura* may have been the source of the contamination. This assumption implies an exceedingly high infection rate of the friars with whip-worms. This postulated local epidemiological situation within the climatic unfavorable Late Middle Ages has to be elucidated with arguments of frequent pilgrimages to southern holy places and study visits of Italian universities.

Stigma among leprosy patients in Senegal: A disease just like any other?

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Social stigma has become a very important topic for medicine and for major health problems during the last half century. Stigma is a very important risk factor, particularly in developing countries, with regard to consultation, diagnosis and long lasting therapy of the disease. Stigmatisation is affected by social, cultural and local factors. The data were collected during 12 weeks of field research, during which 34 semi-structured qualitative interviews were conducted and one focus group discussion was held in Mballing, Senegal. The aim of this research was to investigate the level of stigmatization, the forms of stigmatization and the possible impact of development programs. It could be shown that the traditional concepts regarding the transmission of disease varied markedly between regions and social milieu.

Uncomplicated Amebic Liver Abscess in Travellers: Indication for Image-Guided Puncture?

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Background: Although *Entamoeba histolytica* is one of the most common parasitic infections worldwide, invasive disease remains uncommon in industrialized counties. Metronidazole is the standard of care for complicated and uncomplicated invasive amebiasis. Puncture of amebic liver absscesses is a treatment option primarily for complicated abscesses. However, a subset of patients with uncomplicated amebic liver abscesses fails to respond to conservative treatment alone.

Methods: The role of image-guided percutaneous aspiration in uncomplicated liver abscess formations still remains unanswered. We report two cases of amebic liver abscess formations in Austrian travellers.

Results: Two male patients aged 67 and 43 presented with fever, chills, and fatigue. Patient 2 also had upper abdominal pain and relative eosinophilia (8%). Four months prior to admission both patients travelled together to Goa, India, for 4 weeks. Computed tomography showed uncomplicated liver abscess formations of 6.7x6.3cm in patient 1 and 8.8x7.4cm in patient 2, respectively. Serology for *E. histolytica* was positive in both patients. Therapy with metroniadazol 500mg q6h was initiated. Computed tomography showed an increase in size of liver abscess formations in both patients after 11 and 14 days of metronidazol therapy, respectively. Patient 1 developed pleural effusion and patient 2 additional liver abscess formations. Therefore CT-guided percutaneous therapeutic aspiration of liver abscess formations was performed in both patients without complications. In patient 1 direct microscopy of aspirate revealed alive *E. histolytica*, while in patient 2 direct microscopy was unremarkable. Real time PCR of abscess drainage was positive for *E. histolytica* in both patients. After completion of metronidazol, paromomycin 500mg q8h was initiated for 7 days for elimination of cysts and both patients were discharged without further complaints.

Conclusion: This report highlights that conservative treatment alone may not be sufficient in patients with uncomplicated *E. histolytica* liver abscess. Implementation of additional image guided percutaneous puncture may reduce mortality and disease related costs.

Ticks, Fleas and Lice in South Eastern Bangladesh

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In the northern hemisphere ticks are the most important blood feeding arthropods and the second most important arthropod vectors of human infectious diseases worldwide, being only surpassed by mosquitoes. They can act as vectors for a variety of bacteria, viruses and protozoa, which can induce a multitude of serious diseases. But not only ticks are of importance – fleas are also known to transmit tapeworms as well as bacterial and viral pathogens to both animals and humans. And Lice are in the same way efficient vectors of many diseases, including epidemic typhus, relapsing fever and tularemia. However, there is a lack of knowledge about the ectoparasite fauna in Bangladesh and an urgent need to investigate those fauna to enable examinations for the presence of pathogens in one of the poorest areas of the world, where the population live in close contact with their livestock, and are thus at increased risk of contracting zoonotic diseases.
Within thus project more than 5,300 ticks, fleas and lice were collected by flagging and by "hand-picking" from animal hosts (e.g. cattle, goats, dogs) throughout the District of Bandarban in south eastern Bangladesh and classified.

Borrelia relapsing fever – a disease of poverty?

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Tick-borne relapsing fever occurs worldwide and is caused by several *Borrelia* subspecies. In sub-Saharan African countries it is, as far as there is evidence, transmitted by *Ornithodoros moubata*, a soft tick that lives in traditional African huts and feeds during the night. Chickens and other fowl are discussed as possible hosts. In the Democratic Republic of Congo the knowledge about epidemiologic data, such as distribution and transmission is poor. During a 10-weeks stay in Isiro, North-Eastern Congo, interviews were conducted with eighteen patients who were hospitalised for relapsing fever. Current infection was assured by higher IgM-levels against *Borrelia*. The aim of the study was to investigate the knowledge about *Borrelia* among the patients and the socio-cultural and socio-economic aspects of its transmission. None of the interviewees was aware of the existence of the disease and their infection due to the fact that doctors on-site declared *Malaria tropica,* which represents itself similar to *Borrelia*, as a cause for the fever and flu-like symptoms.

Abenteuer Diagnostik: Geburt, Tod, Immunsuppression und trotzdem nur 2 Parasiten

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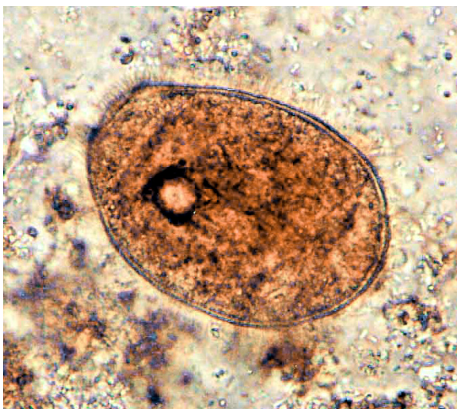
Anhand von 3 Patientenfällen soll gezeigt werden, wie spannend parasitologische Diagnostik sein kann.

Fall 1: Man würde glauben, dass, bei entsprechender Anamnese (2-monatiger Aufenthalt am Malawi-See), ein 24 Stundenharn für den Nachweis einer Parasitose ausreichend sei. Wird die Harnprobe aber falsch gelagert oder dauert der Weg zum Labor zu lange, ist es fast unmöglich, zu einem korrekten Ergebnis zu kommen.
Die Beschwerden des hier betroffenen Patienten dauerten über ein halbes Jahr, bis endlich die richtige Diagnose gestellt werden konnte.

Fall 2: Nach dem Ableben eines Patienten (Todesursache Herzversagen), musste aus verschiedenen Gründen eine Obduktion durchgeführt werden. Bei Untersuchung der Leber wurde aber ein derart bizarres Gebilde sichtbar, dass die Pathologen stark verunsichert waren, welchem Erreger man dieses zuordnen soll. Auf Grund der eigenartigen Färbung und Fältelung, lag die Vermutung nahe, dass es sich um eine seltene oder sogar unbekannte parasitäre Spezies handeln könnte.

Fall 3: Bei Kindern mit Immunsuppression ist die Therapie, gerade bei Lungenerkrankungen, oftmals sehr schwierig. In jenem Stadium, als man die Bronchiallavage eines 16-jährigen Jungen ins Labor zur Untersuchung brachte, war noch kein ausreichender Anhaltspunkt für die vorliegende Klinik gefunden worden.
Bei der mikroskopischen Durchsicht fand man eigenartige Gebilde, die auf ihrer Oberfläche stark wedelnde Zilien aufwiesen. Man hatte den berechtigten Verdacht, dass es sich dabei um ein außerordentliches Vorkommen von *Balantidium coli* in der Lunge handeln könnte. Warum die parasitologische Diagnostik negativ ausfiel, zeigt ein kurzes Video.



Balantidium coli (60 x 100 µm)
aus einer Stuhlprobe

Comparative medicine to speed up drug development

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The newly founded Messerli Research Institute represents an interdisciplinary joint venture between three Viennese universities, focussing on investigation of the man-animal interaction. Among the topics, comparative medicine intends to speed up drug development for veterinary and human medicine, considering the 3R rule (refinement, reduction and replacement of animal studies, according to Directive 2010/63/EU). Several veterinarian diseases can be considered being models of human disease. For instance, dogs (*Canis familiaris*) may develop clinically relevant allergies to environmental substances. They form IgE and four IgG immunoglobulin subclasses and show an immunoglobulin receptor expression profile closely mimicking the human situation. However, the mechanisms for sensitization and responsible allergen molecules have yet not been revealed. Further, 40% of dogs develop tumors at the age of 10 years. Our work indicates that in specific disease settings canines may, besides being veterinarian patients, also serve as models for human malignancies. On the other hand we report possible limitations of comparative strategies. We propose that constant dialogue between the disciplines will enhance our knowledge on disease mechanisms and simultaneously allow speeding up drug development for humans and companion animals.

Konsensuspapier zu Malaria und Malariaprophylaxe

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Im Konsensuspapier zur Malariaprophylaxe werden die österreichischen Leitlinien vorgestellt, die den mit dem Thema befassten Kollegen und Kolleginnen als Rahmenempfehlungen für die Malariaberatung dienen sollen.
Neben der aktuellen epidemiologischen Situation (globaler Rückgang der Malariainzidenz in den letzten zehn Jahren dank einer Vervielfachung des Budgets zur Malariabekämpfung und somit besserer Überwachung und besserem Zugang zu Prophylaxe, Diagnostik und Therapie) und der Resistenzsituation werden die wichtigsten präventiven Maßnahmen vorgestellt:

- Prophylaxe des Krankheitsausbruchs:
  - Infektionsverhütung = „Insect Protection Measures" = IPM
  - Krankheitsverhütung durch Chemoprophylaxe
- Prophylaxe von Folgeschäden = Sekundärprophylaxe:
  - Krankheitsbehandlung durch Notfallselbstmedikation = NSM)

Die genaue Vorgangsweise muss immer unter Berücksichtigung des regionalen Malariarisikos, des zu erwartenden persönliches Risiko (Reiseroute, Unterbringung und Reisestil), der Aufenthaltsdauer, der Resistenzsituation von P. f. (regional im westpazifischen Raum auch für P.v.), Kontraindikationen und potentieller Interaktionen mit Dauermedikamenten, Unverträglichkeiten und des persönlichen Complianceprofils und Ressentiments individuell besprochen werden. Die Malariakarte und eine tabellarische Übersicht nach geografischen Regionen sollen als Entscheidungshilfe für die individuelle Beratung dienen.

Medikamente für die Chemoprophylaxe (vorrangig Atovaquon/Proguanil (Malarone®, hochsynergistische Kombination aus einem Nukleinsäuresynthese-Hemmer und einem Hemmer der Dihydrofolatreduktase-Hemmer), Mefloquin (Lariam®, Methanolchinolin) und Doxycyclin-Monohydrat (z. B. Vibramycin®, Breitbandantibiotikum, keine Zulassung als Malariaprophylaktikum in Österreich) und für die Notfallselbstmedikation (Atovaquon/ Proguanil (Malarone®), Artemether/Lumefantrin (Riamet®, Artemisinin-basiertes Kombinationspräparat) und das neu zugelassene Dihydroartemisinin/Piperaquin (Euratesim®, Kombination aus einem schnell wirkenden Artemisininderivat und dem langsam, jedoch lang wirkenden Piperaquin) werden kurz charakterisiert, Dosierungen und Einnahmevorschriften tabellarisch dargestellt.
Schwangere, Kinder und chronisch Kranke bedürfen spezieller Aufmerksamkeit bei der Malariaberatung, zählen sie doch zu klassischen Risikogruppen. Medikamenteninteraktionen sind ebenfalls bei der Verschreibung von Malariamedikamenten zu beachten, wenn gleich es keine publizierten Daten zu klinisch relevanten Interaktionen gibt.
Die Empfehlungen zur Malariaprophylaxe entsprechen dem bereits bestehenden Konsensus mit den deutschsprachigen Ländern (D-A-CH). Zielvorstellung für die Zukunft ist – im Rahmen des „Expert Committee for Travel Medicine", das neben Experten aus der Schweiz, Deutschland und Österreich mittlerweile auch Vertreter aus Frankreich, Holland und England umfasst, - eine einheitliche Richtlinie im europäischen Raum.

Echinokokkose: Klinik – Diagnostik – Therapie

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Die (CE) zystische Echinokokkose (*Echinococcus granulosus*) verläuft bei den meisten Patienten über lange Zeit (manchmal lebenslang) asymptomatisch. Solitäre oder multiple Leberzysten (die Leber ist mit über 90 % Hauptmanifestationsort) werden häufig bei Routineuntersuchungen oder im Rahmen anderer Grunderkrankungen diagnostiziert. Für die Diagnosesicherung bzw. Differenzierung zwischen z.B. einer dysontogenetischen Leberzyste und einer Echinokokkuszyste sind bildgebende Diagnostik (Ultraschall, CT und/oder MRT), Labordiagnostik und Angaben über eine mögliche Exposition erforderlich. Allerdings gibt es abhängig vom Stadium der Echinokokkose Limitationen sowohl in der Interpretation der Bildgebung als auch in der Serodiagnostik. Generell gilt, dass aufgrund der Serodiagnostik keine (oder nur eine unzureichende) Aussage über die CE-Aktivität möglich ist. Entsprechend gilt, dass serologische Kontrollen als Therapiekontrolle ungeeignet sind. Nach der WHO-Klassifikation werden anhand der Bildgebung (Ultraschall) Echinokokkenzysten in der Leber aufgrund der unterschiedlichen Morphologie in Stadien CE I bis CE V eingeteilt. Die Einteilung entspricht in etwa auch der Aktivität der jeweiligen Zyste und ist die Grundlage für die therapeutische Strategie. Im Stadium CE I bis CE II handelt es sich um eine noch aktive Infektion, CE III befindet sich im Übergang (transitional), CE IV und CE V sind inaktive Stadien, die normalerweise keiner Therapie bedürfen. In der serologischen Stufendiagnostik werden im ersten Schritt Screening-Tests (IHA, IIFT, EIA) benutzt mit einer stadienspezifisch unterschiedlichen Sensitivität (zwischen 70-90 %), im Bestätigungstest kommt der Immunoblot mit hoher Spezifität zur Anwendung. Dennoch werden bis zu 30 % der Infektionen serologisch nicht erkannt. Eine operative Intervention (z.B. laparaskopische Entdeckelung) bei einem Patienten mit einer CE I Zyste und falschnegativer Serologie kann jedoch fatale Folgen haben (intraoperative Anaphylaxie, Dissemination von hochaktiver Hydatidenflüssigkeit in den Bauchraum).

Die (AE) alveoläre Echinokokkose (*Echinococcus multilocularis*) wird häufig erst beim symptomatischen Patienten diagnostiziert nachdem der Parasit durch sein infiltrierendes Wachstum z.B. Leberparenchym und begleitende Gallengänge zerstört hat. Für die Diagnosesicherung ist die Bildgebung, Serodiagnostik und Angaben zur Exposition erforderlich. In der serologischen Stufendiagnostik werden überwiegend die o.g. Screeningtests (E.granulosus Antigen EIA, IHA, IIFT), zusätzlich der sogenannter Em2 EIA (E. multilocularis Antigen) und der Immunoblot als Bestätigungstest eingesetzt. In einigen Fällen lassen Bildgebung, Herkunft und Serodiagnostik keine eindeutige Diagnosesicherung zu, sodass eine diagnostische Punktion (Histopathologie, PCR) bei V.a. AE erforderlich wird. Eine Diagnosesicherung sollte v.a. zum Ausschluss wichtiger Differentialdiagnosen (DD maligne Lebererkrankungen) und der bei AE erforderlichen lebenslangen Suppressions-therapie mit Albendazol erfolgen. Falschnegative Em2 EIA-Ergebnisse, sog. Pseudozysten bei AE Patienten in der Bildgebung und überlappende Endemiegebiete von CE und AE (z.B. Türkei, Kasachstan, China) können die Differenzierung zwischen CE und AE erschweren.

Fazit: Zum Ausschluss bzw. Diagnose einer Echinokokkose sind neben der Serodiagnostik bildgebende Verfahren und Angaben zur Exposition erforderlich. Bei seltenen und im klinischen Verlauf komplexen Erkrankungen wie der Echinokokkose ist die interdisziplinäre Zusammenarbeit mit einem Referenzzentrum **vor** der therapeutischen Maßnahme dringend zu empfehlen, dies ist sowohl zeitlich als auch technisch möglich.

HIV-infected immigrants from HIV high-prevalence countries to Austria are diagnosed later, treated less successfully, and lost to follow-up more frequently than Austrian HIV-positive patients.

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The majority of HIV-infected immigrants in Austria are being cared for in the 7 clinical centres of the Austrian HIV Cohort Study (AHIVCOS). The objective of this analysis is to evaluate epidemiological and clinical parameters in immigrants from HIV high-prevalence countries and compare them with patients from HIV low-prevalence areas.

Of the 3694 HIV-infected patients currently on follow-up in the AHIVCOS centres, 393 (10.6%) originate from high-prevalence countries. Their median age is 36.3 years and 226 (57.5%) are female. HIV was transmitted through heterosexual contact in 345 individuals (87.8%). 107 (27.2%) have already suffered from an AIDS defining illness.

When compared with patients from Austria and other low-prevalence countries, immigrants from high-prevalence areas are more likely to be diagnosed at late stages of HIV infection (60.2% vs. 47.5%; $p<0.001$) and less likely to be diagnosed early in the course of infection (4.7% vs. 19.1%; $p<0.001$). They are at higher risk of not receiving/taking antiretroviral treatment despite low CD4 cell counts (10.6% vs. 5.7%; adjusted OR 2.5, 95% CI 1.5-4.0, for CD4 Nadir < 200/µl). Once on treatment, immigrants from high-prevalence countries are more likely not to be virologically suppressed (HIV RNA>400 copies/ml in 7.1% vs. 3.5%; $p=0.002$). Loss to follow-up happens more frequently in this group of patients (adjusted OR 2.9; 95% CI 2.3-4.2; $p<0,001$).

Our data indicate that there is a need for interventions to facilitate earlier diagnosis and better care for the HIV-infected immigrant population living in Austria.

Cloning, Expression and Characterisation of Glycosyltransferases from the Mosquito *Anopheles gambiae*

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The mosquito *Anopheles gambiae* is the primary vector of human malaria. This disease causes between 200 and 500 million clinical cases and more than one million deaths each year. For malaria transmission, the development of the *Plasmodium* parasite in the *A. gambiae* mosquito is crucial. Two major tissues and two fundamental steps within the mosquito are required for the parasite development and transmission. First, the *Plasmodium* ookinete stage is recognized and attached to luminal membrane ligands of the mosquito midgut epithelium prior to invasion. The second step is the transmission of the sporozoites into a new vertebrate host. Both steps, binding of parasite in insect vector and in vertebrate host cells, have been connected to the presence of oligosaccharide structures (glycans).

As the *A. gambiae* genome was published recently, three fucosyltransferases and one peptide-O-xylosyltransferase were found. By homology searching *A. gambiae* has a Lewis type, a core alpha 1,3 and a core alpha 1,6 fucosyltransferase. All three fucosyltransferases as well as the xylosyltransferase were cloned with a FLAG-tag into pPICZαC vectors and transformed in *Pichia pastoris* GS115 cells using zeocin selection. The recombinant core alpha 1,6 fucosyltransferase (AgFucT6) was expressed and purified by Affi-Gel Blue affinity chromatography. The characterisation of AgFucT6 shows that in comparison to many other glycosyltransferases, the mosquito core alpha 1,6 fucosyltransferase has no absolute requirement for any special divalent cation.
The mosquito core alpha 1,6 fucosyltransferase was then used in an apo-transferrin remodelling experiment to create positive controls for Lectin Blot analysis.

The peptide-O-xylosyltransferase (AgOXT1) was also expressed and characterised; in MALDI-TOF MS and HPLC-based assays various optima were determined as well as its K_m value for the UDP-Xyl donor. In other in vivo experiments, RNAi of AgOXT1 in the midgut disrupted ookinete invasion, whereas RNAi in the salivary glands of the mosquito indicates a role for heparan sulphate in sporozoite invasion.

„Diversity Medicine“: Social and cultural competence at the Medical University Vienna

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The medical system is increasingly confronted with patients from very diverse socio-cultural backgrounds. Not only pose the various languages spoken a problem to any health care provider. The communication is further challenged by differing explanatory models of disease of the patient and the physician or nurse, resulting in what often seems incompatible concepts of diagnosis and therapy.

In Europe several initiatives exist which try to provide an answer to these challenges. Institutional responses in Vienna, however, are very rare. The Medical University of Vienna has now started an initiative to deal with these specific problems of diversity in medicine.

Hepatitis and migration

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Ebola in Uganda – Medical Anthropological Aspects

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Ten years after the outbreak of Ebola haemorrhagic fever (EHF) in the north Ugandan city of Gulu, this study aims to evaluate retrospectively short- and long-term effects of this highly infectious and fatal disease both on individuals and societies. In June 2010, qualitative, semi-structured interviews with 15 people involved in the outbreak were conducted in the District of Gulu. It could be shown that changes, e.g. in the hygienic behaviour of individuals persisted, while major social rituals like traditional burial practices, that were forbidden during the time of the outbreak, were not modified. Secondly, a characteristic attitude of social isolation could be described at two levels. On the one hand infected individuals and their families were stigmatized by other members of the community; on the other hand the whole community was avoided by other parts of the country's society. A systematic analysis of the social and cultural implications of interventions has not been carried out yet.

Interaction of *Listeria monocytogenes* with free-living amoebae

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Listeria monocytogenes is among the most important food-borne pathogens. Despite the fact that the virulence mechanisms of *L. monocytogenes* are very well characterized, and the demonstration of the ubiquitous distribution of *L. monocytogenes* in the environment, our knowledge about putative environmental reservoir(s) of *L. monocytogenes* is still limited.
In this study we investigated the interaction of *L. monocytogenes* with free living amoebae of the genus *Acanthamoeba*. In the environment as well as in food-production environments (e.g. drinking water systems), *L. monocytogenes* is faced with predation by ubiquitous protozoa. Particularly acanthamoebae have been shown to be important as hosts and shelters for pathogenic bacteria in the environment. We therefore speculated that amoebae might also represent an environmental reservoir for *Listeria monocytogenes*.
To test the ability of *L. monocytogenes* to survive in amoebae, we developed an infection assay. Using this assay, we could show that *L. monocytogenes* can survive in acanthamoebae. Using confocal laser scanning microscopy, we could also show the presence of *L. monocytogenes* in amoeba trophozoites and cysts. This is particularly interesting as amoebal cysts are highly resistant to various environmental stresses such as disinfectants, desiccation, or nutrient deprivation. The presence of *L. monocytogenes* in amoebal cysts might thus allow the survival of adverse environmental conditions and represent one putative reservoir of *Listeria* in the environment as well as food-production environments.

Animal Models in Biomedical Research

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Update zu Wurmerkrankungen in SO-Asien

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Wurmerkrankungen haben einen komplizierten Entwicklungszyklus. Mehrere Stadien in der Umwelt und im Menschen bilden den Lebenszyklus dieser Parasiten. Faktoren der Umwelt und der Bevölkerung, wie z. B. sozio-ökonomische Status und spezifisches Verhalten sind für eine Übertragung von grundlegender Bedeutung.

In Südostasien besteht ein ideales Klima für eine optimale Wurmübertragung, insbesondere sind die Temperaturen und die Verfügbarkeit von Wasser ausserordentlich förderlich. Ausserdem besitzen viele Bevölkerungsgruppen Ernährungsweisen wie z.B. der häufige Konsum von rohen und / oder wenig gekochten Nahrungsmitteln, wie Gemüse, Fisch oder Fleisch, die für Wurmübertragungen nötig sind. Es sind nahrungsmittelübertragene Wurmerkrankungen, die in Südostasien von grösster Bedeutung sind.

In diesem Update wird ein Überblick über die heute wichtigsten Nematoden, Trematoden und Zestoden in Südostasien gegeben. Die Epidemiologie und Public Health Bedeutung der Wurmerreger und der daraus resultierenden Krankheiten (z.B. Cholangiocarcinoma), wird an den wichtigsten Beispielen der Region verdeutlicht. Die Ausscheidungsdynamiken der Wurmeier und die nahe Verwandtschaft der verschiedenen Wurmgruppen bilden eine besondere Herausforderung für die Diagnose. Evaluationen neuer Moleküle geben Hinweise auf alternative Medikamenten, von welchen vor allem die lokale Bevölkerungen profitieren würden.

Transcription profiles for two key gender-specific gene families in *Oesophagostomum dentatum* during development *in vivo* and *in vitro*

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In strongylid roundworms, such as *Oesophagostomum dentatum* (porcine nodule worm), some sex-specific genes can serve as targets of intervention since their transcription is thought to be correlated with parasite maturation, development and reproduction. In this study, an analysis of transcription of the two sex-specific genes (*vit* and *msp*) encoding vitellogenin and major sperm protein of *O. dentatum*, respectively, revealed that adult females transcribed *vit* and adult males *msp* at high levels, whereas neither the immature larval stages nor pre-adult worms from *in vitro* cultures transcribed *vit* or *msp*. Furthermore neither presence nor absence of the heterologous sex, nor the duration of infection, was central to *vit* or *msp* transcription. The analysis showed that in small or "virgin" adults, no or only low-level transcription of *vit* and *msp* was detectable. We hypothesize that the transcription of *vit* and *msp* is not linked to exogenous influences but instead to endogenous factors, such as size, maturation of the reproductive organs and/or fitness of the worms. The maturation of worms appears to be correlated, to some extent, to the expression of the investigated genes, and interference with gene expression may provide a novel intervention strategy.

Parasites of Fish from Lake Naivasha, Kenya: First Results

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Lake Naivasha is one of the Rift Valley lakes lying between 00°45'S and 36°20'E. It is the only freshwater lake in the Rift Valley without an outlet. It covers about 160km^2 of a closed basin at an altitude of 1890 m above sea level. The lake`s water level faces fluctuations due to water abstraction for agriculture and other purposes. The recent fish population of the lake is based on introduced species namely common carp *Cyprinus carpio* and largemouth bass *Micropterus salmoides*, which are non-native to East Africa. Athi River tilapia *Oreochromis spilurus niger* (syn. *Tilapia nigra),* the blue spotted tilapia *Oreochromis leucostictus*, and straightfin barb *Barbus paludinosus* (syn. B. *amphigramma*) are introduced species native to east Africa but non-native to Lake Naivasha. The catch composition has been changing in the past few years. Before the year 2003, Tilapines and black bass dominated the catch. However since 2004 common carp has been forming above 85% of the catch with up to 90t per year and thus making it a very important food source for humans in the area.
Several studies on parasites of fish from Lake Naivasha have been published so far, but to the best of our knowledge no reports of ectoparasites exist, nor has the parasitic community of *C. carpio* from this lake been studied before. Therefore it seemed of high interest to analyze the ecto- and endoparasitic fauna of *C. carpio* and to include other fish species from Lake Naivasha in order to contribute to the existing body of knowledge. A total of 286 fishes belonging to four different species were collected from Lake Naivasha between February and August 2011. Standard dissection and parasitological procedures were used in examining fish for parasites: skin, fins, gills, eyes, the body cavity, pericardial cavity and the intestines were investigated for macro parasites with a binocular. Scratch-samples from the gills and the skin were also checked for protozoans at higher magnification using a compound microscope.
The most prevalent parasites from *C. carpio* were *Dactylogyrus* spp. from the gills followed by *Tylodelphys* sp. from the vitreous humor of the eyes. From *O. leucostictus* Dactylogyridae, and *Cichlidogyrus* sp., both from the gills were most prevalent, followed by *Tylodelphys* sp. from the eyes and *Contracaecum* sp. from the body cavity. Other parasite taxa discovered during this survey include *Heterophyes* sp., yet unidentified gill metacercariae and intestinal cestodes also not identified yet.

Strain-specific modifications of the N-linked oligosaccharides of *Trichomonas vaginalis*

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Trichomonad species are widespread unicellular flagellated parasites of vertebrates which interact with their hosts through carbohydrate-lectin interactions. In the past, some data has been accumulated regarding their lipo(phospho)glycans, a major glycoconjugate on their cell surfaces; on the other hand, other than biosynthetic aspects, few details about their N-linked oligosaccharides are known. In this study, we present both mass spectrometric and HPLC data about the N-glycans of different strains of *Trichomonas vaginalis*, a parasite of the human reproductive tract. The major structure in all strains examined is a truncated oligomannose form ($Man_5GlcNAc_2$) with α1,2-mannose residues, compatible with a previous bioinformatic examination of the glycogenomic potential of *T. vaginalis*. In addition, dependent on the strain, N-glycans modified by pentose residues, phosphate or phosphoethanolamine and terminal N-acetyllactosamine (Galβ1,4GlcNAc) units were found. The modification of N-glycans by *N*-acetyllactosamine in at least some strains is shared with the lipo(phospho)glycan and may represent a further interaction partner for host galectins, thereby playing a role in binding of the parasite to host epithelia. On the other hand, the variation in glycosylation between strains may be the result of genetic diversity within this species.

Rotavirus Gastroenteritis in Hospitalized Children in Austria 2010: Sustained Low Hospitalization Rates and Herd Immunity

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Background
Rotavirus vaccination has been subsidized in Austria since 2007 for all children below six months of age and vaccination coverage rates have increased to 87 % in 2010. In Austria, a distinct decrease not only in the vaccinated cohort, but also in older age groups not suitable for vaccination has been observed by 2009, thus indicating herd immunity.

Methods
In a nationwide sentinel surveillance system paediatricians have been reporting anonymous data on hospitalized children with Rotavirus gastroenteritis (RV-GE) annually; the data has been extrapolated to all children in the respective age groups in Austria.

Results
In 2010, 371 cases of RV-GE in hospitalized children below 15 years of age were reported which is 40 % less than in the year 2008 and 74 % less compared to the average number of reported cases in the years 2001–2005. In 2010, the extrapolated number of cases was 1215; the incidence rate of hospitalized children with RV-GE <12 months was 338 per 100,000 and in the age group 12 to <24 it was 342 per 100,000, respectively. In children between 2 and 5 years the incidence rate was 212 per 100,000 and in those 5 to <15 years it was 21 per 100,000, respectively. In the year 2010 7.9 % of the reported children were <3 months of age and therefore too young for the full course of immunizations. 21.4 % of the children were below 12 months of age and 22.0 % were between 1 and <2 years old. On average children stayed in hospital for 3.3 days accounting for a total of about 4000 days in hospital due to RV-GE. These numbers result in a reduction of 77 % of hospital days compared to the period 2001–2005.

Conclusion
Up to three and a half years after the start of the universal mass vaccination against RV-GE, a massive reduction of hospitalizations of children due to RV-GE as well as herd immunity was observed in Austria.

Chronic *Leishmania* Infections in Asymptomatic Individuals in Austria

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Background
In Central Europe, leishmaniasis is a rare disease, diagnosed almost exclusively in travellers or migrants coming from tropical or subtropical countries. In the past years, there has been growing evidence for endemic populations of sandflies in several Central European countries. As, in all of these countries the number of infected dogs acting as reservoir hosts is considerable, also autochthonous infections have become possible. The aim of the present study was to assess the burden of *Leishmania* infections in Austria.

Methods
We conducted an explorative national cross-sectional serological study on 1048 healthy Austrian individuals volunteering for UN missions. Anti-*Leishmania* antibodies were assessed using a commercial ELISA kit. All positive subjects were re-tested after 12 months for remaining antibodies by ELISA and for parasitic DNA by a commercial oligochromatographic test. All PCR positive samples were re-tested by a second PCR and amplicons of this PCR were subjected to DNA sequencing for identification.

Results
Altogether, 47 individuals (4.5%) were positive in the serological screening, additional 32 (3.1%) samples showed borderline-positive results. 42 of the sero-positive subjects could be re-sampled after 12 months and of these 18 were still positive and additional 9 were borderline-positive. Of these, 4 were positive in the oligochromatographic test and 2 were positive by PCR. One was identified as *Leishmania panamensis* (*L. guyanensis* complex) and one as *Leishmania donovani/infantum* complex. Interestingly, previous international military operations were not associated with a higher risk of *Leishmania* exposition.

Conclusion
Our data demonstrate that the burden of infections with *Leishmania* in non-endemic countries is considerably underestimated and warrants further epidemiological investigations.

Coughing and fever after surfing in Central America

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We report of a nineteen year old surfer who presented with chronic cough returning from Central America. X-ray and full blood count, which were performed in Costa Rica were without pathology, laboratory parameters showed a slightly increased CRP-(59mg/l) and thrombocyte values (3.5T/l). Immune serological tests for typhus, paratyphus, brucellosis, rickettsioses, leptospirosis and dengue fever were negative. An ambulant antimicrobial treatment with ciprofloxacine was without any clinical effect. CT-thorax identified a solid lesion (20x30mm, right middle lobe of the lung). A bronchoscopic examination was rejected by the patient. The aetiology suspected was substantiated by a positive immune diffusion result.

Extraintestinal Helminth Infections in Rodents from the Chittagong Hill Tracts in Southeastern Bangladesh

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Rodents are known as hosts of various zoonotic helminth species which are directly (i.e., *Calodium hepaticum*) or indirectly (i.e., *Taenia taeniaeformis*) transmittable to humans. Some of them have the capability to cause severe diseases in the human host (e.g., hepatic capillariosis), others are rarely detected in humans (i.e., *Taenia taeniaeformis*, *C. hepaticum*). Within this project the extraintestinal parasite fauna of more than 75 rodents of the families Muridae and Sciuridae was determined in the District of Bandarban (Chittagong Hill Tracts) in Southeastern Bangladesh. Helminthic infestations were examined by macro- and microscopical tools (e.g. trichinoscopy) at the MARIB field site in Bandarban.

Tuberculosis and migration

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Porcine lymphocyte subpopulations – swine is not a big mouse

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Porcine lymphocytes are unique in regard to their composition of T-cell subsets and NK cells. Surface expression of differentiation and activation antigens differ in many cases from expression pattern described for other species, especially mice.
Analyses of the expression pattern of CD4 and CD8α show that porcine $CD4^+$ T-helper cells contain a substantial proportion of $CD4^+CD8\alpha^+$ cells. This T-cell subpopulation includes cells with the function of T-helper effector and memory cells. In addition the majority of them co-express MHC-II (SLA-DR) molecules.
The porcine cytolytic cell subset defined by the lack of CD4 and the expression of CD8α can be discriminated into CD8αβ MHC-I restricted cytolytic T-cells and $CD4^-CD8\alpha^+$ cells being negative for CD3 which display the porcine NK-cell population.
Furthermore $CD3^+$ T cells with TcR-γδ T-cell receptors represent a substantial proportion of porcine T cells. This $CD4^-$TcR-$\gamma\delta^+$ T-cell subset includes a heterogeneous group of phenotypes in regard to their CD8α, SWC5, MHC-II and CD2 expression. Obvious are a lack of $CD2^+SWC5^+$ cells and a preferentially homing of $CD2^+SWC5^-$TcR-γδ cells in lymphoid tissues. The detailed function(s) of the TcR γδ T-cell subset(s) still has to be elucidated. Preliminary data in swine show that peripheral blood TcR-γδ cells can be stimulated with Concanavalin A (ConA) and a cocktail of cytokines (IL-2, IL-12 and IL-18) for proliferation, further differentiation combined with an up-regulation of CD2, CD8α, and MHC-II expression and IFN-γ synthesis.
Porcine NK cells which belong to the CD8α expressing cytolytic cell subset are characterized by a $CD3^-CD8\alpha^+CD16^+$ phenotype. In swine they can be analyzed in more detail by using a newly generated monoclonal antibody against porcine NKp46 (CD335). In contrast to all species studied so far porcine NKp46 is not expressed on all NK cells. Whereas the cytolytic activity against allo- and xenogeneic target cells is shared by $NKp46^+$ and $NKp46^-$ NK-cell subsets $NKp46^+$ NK cells show a much higher IFN-γ production than $NKp46^-$ NK cells.
In summary our data show that immunological standards derived from mice cannot be copied one-to-one onto the porcine immune system. A substantial reflection of achieved data and a detailed knowledge of the porcine immune system are necessary for a comprehensive interpretation of the results obtained in the species swine. The presented data indeed give a more detailed insight into the porcine lymphocyte subpopulations but they also generate a huge panel of new questions and ideas.

Oesophagostomum dentatum extracts induce regulatory responses and suppress allergic responses in mice

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Recent epidemiological and experimental data clearly indicate that infections with certain helminth parasites reduce the development of allergic diseases by regulatory mechanisms that involve the induction of IL-10 and/or TGF-beta. Here we investigated whether extracts derived from swine nematode parasite *Oesophagostomum denatatum* prevent the development of birch pollen allergy in mice. Firstly, mice immunised with *O. dentatum* extracts induced production of antibodies in serum and markedly increased levels of Th2-specific and regulatory cytokines (IL-4, IL-5, IL-10, and TGF-beta) in re-stimulated splenocytes and mesenteric lymph node (MLN) cells. Secondly, application of *O. dentatum* extracts simultaneously with sensitization to major birch pollen allergen Bet v 1 prevented the development of airway inflammation, as demonstrated by attenuation of bronchoalveolar lavages (BAL) eosinophil influx, IL-4 and IL-5 levels in lung and lung lymph node cell cultures, peribronchial inflammatory infiltrate, and mucus secretion. Furthermore, these mice had significantly reduced Bet v 1-specific antibody titres in serum (IgG1 and IgG2a) as well as serum IgE-dependent basophil degranulation. Reduced secretion of Th2-related cytokines by birch pollen-re-stimulated splenocytes and MLN cells was observed in *O. dentatum* extract-treated mice in comparison to controls. Stimulation of bone marrow-derived dendritic cells with *O. dentatum* extract induced the production of IL-10 and TGF-beta. However, the *in vivo* role of these regulatory cytokines in allergy prevention by *O. dentatum* extract has still to be investigated. Our data strongly support the hygiene hypothesis and suggest that helminth parasite-derived products posses an immunomodulatory potential with allergy-protective effects. This observation may lead to the development of new drugs for allergy prevention/treatment.

Telemedizin in der Diagnostik von Parasitosen

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Infektionskrankheiten gehören während eines Auslandseinsatzes der Bundeswehr zu den häufigsten Erkrankungen. Für ihre Diagnostik benötigt man spezielle Verfahren und Expertise, die durch die mikrobiologischen Feldlaboratorien bereitgestellt werden.
Um den diagnostischen Prozess telemedizinisch zu unterstützen, wurde ein Modul „Telemikrobiologie“ mit spezieller Geräte-, Kamera- und Softwareausstattung als Modifikation des standardmäßig verwendeten telemedizinischen Arbeitsplatzes entworfen und validiert. Mittels dieser Anwendung, deren Kernelemente eine auf Mikroskop und Stereolupe konnektierbare Kamera sowie eine Spezialsoftware für Bildkommunikation, -archivierung und -auswertung sind, kann die volle Fachexpertise des Instituts in den Einsätzen verfügbar gemacht werden.
Das Modul wurde in der Folge in allen Einsatzgebieten in den jeweiligen Feldlaboratorien in Afghanistan und Kosovo installiert und hat sich in der Routineanwendung bewährt. Es ermöglicht die sekundenschnelle Übertragung qualitativ hochwertiger statischer Bilder von mikroskopischen Präparaten (Med. Parasitologie und Bakteriologie) oder von bewachsenen Nährmedien (Bakteriologie).
Die telemedizinische Einbeziehung des Experten verbessert die diagnostische Spezifität durch Vermeidung falsch-positiver Befunde und erlaubt ohne vorherigen Probenversand nach Deutschland therapieentscheidende Diagnosestellungen, vor allem in der Medizinischen Parasitologie. In der Bakteriologie wird die Steuerung des diagnostischen Prozesses durch die Expertenstelle auch dann möglich, wenn im mikrobiologischen Feldlabor vor Ort ausschließlich technisches Personal eingesetzt ist.
Das System kann in den Feldlaboratorien somit in der „primary opinion“ oder „secondary opinion“ – Version betrieben werden.
Das Koblenzer Telemikrobiologie – System hat seit der ersten Einführung dazu beigetragen, eine qualitativ hochwertige, standardisierte und sehr schnelle Diagnostik in den Einsatzszenarien vorhalten zu können. Der entscheidende Faktor ist die sofortige Verfügbarkeit von Fachexpertise im Einsatzland, ohne die Präsenz eines Experten vor Ort.

Identification of potential thioredoxin target proteins in *Entamoeba histolytica* using Trx-affinity chromatography

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Entamoeba histolytica, an intestinal protozoan that is the causative agent of amoebiasis, possesses a functional NADPH-dependent thioredoxin system comprising the dithiol-containing redox proteins thioredoxin (Trx) and thioredoxin reductase (TrxR). Both proteins were found to be covalently modified by the 5-nitroimidazole drug metronidazole which consequently led to the loss of disulfide reducing activity of the TrxR/Trx system and the covalent modification of only a few defined proteins. The aim of the present study was to search systematically for further interaction partners of thioredoxin in order to extend our understanding of the lethal action of metronidazole in *E. histolytica*. Based on the Trx reduction mechanism we constructed an active site mutant of Trx lacking the resolving cysteine residue. The recombinant mutant protein ($EhTrx^{C34S}$) was immobilized on Ni-NTA resin to capture target proteins from *E. histolytica* cell extracts after formation of intermolecular disulfide bonds. $EhTrx^{C34S}$ and covalently linked proteins were eluted and visualized by two-dimensional gel electrophoresis and Coomassie Blue staining. 14 out of 55 Trx-captured proteins were analyzed by liquid chromatography-tandem mass spectrometry of which all can be classified in 5 categories corresponding to definite biological processes: metabolism, detoxification and defense, protein folding and degradation, cytoskeleton and vesicular trafficking.

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Tropical Neurology is not Neurology in resource poor countries

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Tropical Neurology encompasses a wide range of infectious and non-infections clinical presentations. It is not limited to viral, bacterial, protozoal, helminthic, fungal infections, but also reflects the expression of many non-infectious diseases in the specific environment where perinatal injury, malnutrition, traumatic brain injury, cerebrovascular and degenerative diseases tend to show patterns as seen in previous decades and centuries in Western countries. In addition, younger societies do show different disease distributions. Although many so called tropical countries (e. g. India, Brazil, several African countries (Tanzania, Botswana, Uganda, Ghana, etc.)) show remarkable economic and socio-economic changes and improvement, still, in many countries between the tropics of Cancer and Capricorn, social injustice, economic inequalities, lack of education, political unrest and climatic catastrophes are rampant and contribute to diseases not or not anymore seen in Western/European countries leading to increased incidence and prevalence of potentially preventable diseases, as tetanus, wound infections, nutritive disorders etc.

Beside the lack of skilled and trained personnel (eleven African countries do not have a single neurologist or neurosurgeon) the technical equipment rendering neurological workup easy and possible in our day-to-day work is either outdated, not properly maintained (lacking funds) or simply non-existent (e.g., neuroimaging-cCT, MRT, EEG etc.)

This presentation will concentrate not onto the systematics of tropical neurology, not discussing infections/infestations of the nervous system neither neurologic diseases due to malnutrition, congenital/hereditary diseases of the nervous system nor diseases of the nervous system associated with environmental factors, or diseases caused by neurotoxins, etc. It will highlight the utmost necessity to assess a patient with neurologic disease in a clinical, syndromatic approach. In resource poor countries the skills of an appropriate neurologic examination, best knowledge of neuroanatomy and neurophysiologic processes may still replace invasive or non-invasive diagnostics (neuroimaging, etc.) or may allow for best possible selection of those patients who will and do benefit from a costly, expensive imaging procedure or other examination as EEG, EMG, etc..

The syndromatic approach, highlighted by a single disease for each topic, must comprise syndromes seen in diseases of the central nervous system (brain and spine), as:

- impairment of consciousness coma with fever
- neck stiffness, meningism, meningeal irritation
- acute onset headache
- (subacute) impairment of consciousness without fever
- seizures, epilepsies
- extrapyramidal signs and symptoms
- syndrome of chronic meningitis
- acute focal neurologic deficit
- acute paraplegia
- subacutely/chronically developing paraplegia

as well as peripheral nervous system syndromes:

- cranial nerve affection
- radicular syndrome
- peripheral nerve lesion
- polyneuropathy
- myositis/myopathy/diseases of the neuromuscular junction.

For each of these diseases an important, prominent example will be discussed briefly in its different approach in tropical and non tropical setting. The knowledge of neurologic diseases in resource poor countries is essential even for central European neurologists, both in view of the increasing travelers to and from tropical countries, migrants/immigrants as well as refugees and asylum seekers.

The training in neurology being highly technique-oriented in our universities and hospitals may pose a danger for the population in resource poor countries when Western trained neurologists offer their workforce for short periods of time (working holidays!?) in resource poor countries. Both, these neurologists and patients will suffer from potential dangers and stress, the European trained neurologists being hopelessly overstrained, the patients not getting the best possible treatment although being treated by a “specialist in the field”.

Finally, the change in epidemiology of various neurologic diseases throughout the past few decades must be stressed, in many urban or semi-urban areas in resource poor countries/tropical countries infectious diseases of the nervous system are not any more the most prominent and most important diseases, change in lifestyle has led to a rapid increase of cerebrovascular disease, traumatic brain injury and all their consequences putting too high a burden onto the health system and leaving many patients, at least in the post-acute and rehabilitation phase completely alone relying heavily on limited family resources.

Chronic meningo-encephalitis with palsy of the right abducens nerve after journey to Mexico

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Introduction

Touristic activities bring a growing number of persons from developed countries far abroad to exotic landscapes and in in contact with tropical diseases – neurological and psychiatric symptoms might be among the presents brought back home. Those problems may mystify patient and physician later on in the home country.

Case Report

A 62yr old female Upper Austrian Caucasian native presented in a local hospital with subacute sympoms of cephalea located occipital and biparietal since June 2011. She had no vegetative symptoms and no fever. CCT was normal, blood laboratory tests did not reveal inflammatory signs. Treatment with NSAR was started with small initial effect. Two weeks later she developed diplopia, neurological examination showed palsy of the right abducens nerve and she was then transferred to the Landesnervenklinik in Linz. Anamnesis revealed a recent backpacker journey through subtropical areas of Mexico in April 2011. Insect bites were recorded.

MRI showed subdural effusions bihemispherically and meningeal hyperemia. The right abducens nerve did not present pathological findings. Lumbar punction was done and CSF showed 17 cells/µl and elevated proteins at 112mg/dl, lactate was normal and oligoclonal bands were negative. Antibiotics (Rocephin) were then started. All PCR and serological examinations of CSF were negative (T. solium, Strongyloides spp., Cyrptococcus, Leptospira spp, Brucella, Herpes virus, Borrellia burgdorferi, Tbc a.s.o.).

Control lumbar punction showed a decrease of cell count (12/µl) and decrease of proteins (44mg/dl). FDG-PET imaging of the brain and body was without pathological findings. Fortunately our patient improved clinically the following two weeks, diplopia became less. Working hypotheses was bacterial chronical meningitis, antibiotic therapy was switched to oral doxycyclin for further four weeks. Further conclusions will be available for presentation at the congress.

Conclusion

In spite of a plethora of diagnostic tools the clinical physician has to follow pragmatic concepts – even more when the patient has a record of a journey to tropical areas.

The influence of maternal antibodies on neonatal porcine coccidiosis

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In the first weeks of life almost no discrete antibody production occurs in suckling piglets. Therefore, transmission of maternally derived antibodies via colostrum and milk is essential for humoral protection against infectious diseases.
Regarding *Isospora suis*, the causative agent of neonatal porcine coccidiosis, only little is known about maternal transfer of specific antibodies. Moreover, a possible protective role of such antibodies against infections with *I. suis* still remains to be demonstrated.
Blood samples of 34 piglets were taken before colostrum uptake, on the first day of life (DOL) and in weekly intervals. In parallel, colostral and milk serum was obtained from the sows. On the third DOL 22 piglets were infected with *I. suis*, 12 animals remained non-infected. Oocyst excretion, faecal consistency and weight gain where monitored continuously until the fourth week of life.
The serum antibody titre (IgG, IgA, IgM) of blood, colostrum and milk, was determined using an Indirect Immunofluorescence Antibody Test with *I. suis*-merozoites as antigen.
Colostral serum showed very high antibody titres, in case of IgG up to 1:20480. Infected and non-infected piglets had comparable titres after ingestion of colostrum. From DOL 14 on the IgG-titres of all animals decreased continuously, this was significantly stronger in infected piglets. IgM- and IgA-titres showed a marked reduction in serum after DOL 14 but no significant differences were detected between infected and non-infected animals. In infected animals there was no correlation between antibody-titres and oocyst excretion. On the other hand, a higher IgA-titre was correlated with more solid faecal consistency. This suggests a positive influence of IgA-antibodies on the severity of the disease by reduction of diarrhoea but no influence on the parasite development as demonstrated by shedding of oocysts.

Comparative studies on the prevalence of African animal trypanosomiasis in Burkina Faso using conventional and quantitative real-time PCR

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African animal trypanosomiasis (AAT) constitutes the most important cattle disease in the tsetse belt zone of Burkina Faso. In this study the prevalence of AAT from indigenous trypanotolerant Baoulé cattle, susceptible Zebu cattle and their crosses were determined and compared. Blood samples consisting of 320 samples from Baoulé (n = 102), Zebu (n = 33) and Baoulé/Zebu crosses (n = 185) were collected in 23 locations of the tsetse areas of Burkina Faso. Using the internal transcribed spacer 1 (ITS1) region of the ribosomal DNA several *Trypanosoma* species could be identified in a conventional PCR reaction. The overall prevalence was 9.7 % with the lowest infection rate in Baoulé and highest infections rate in Zebu cattle. For a more sensitive simultaneous detection of *T. congolense*, *T. brucei* and *T. vivax* a novel qPCR assay was designed using the bovine toll-like receptor 8 as internal control. The qPCR approach resulted in a higher overall prevalence of 11.25 %. The results indicate that trypanosome infections in Burkina Faso can be predominately accounted to *T. vivax* and that Baoulé cattle have a lower infection rate compared to Zebu cattle. Further studies on the genotype of the host animals using single nucleotide polymorphisms and microsatellite markers are anticipated to get a deeper insight into the genetics of trypanotolerance.

Comparative oncology: ErbB-1 and ErbB-2 as promising targets due to striking homology in canine and human cancer.

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In human medicine the use of antibodies against tumor associated antigens as passive immunotherapy is an established therapy option for cancer patients; for instance cetuximab (Erbitux®) for treatment of ErbB-1 (EGFR) overexpressing colon and head and neck cancer, or trastuzumab (Herceptin®) for metastatic breast cancer overexpressing ErbB-2 (HER-2).
It is well known that also dogs develop tumors, showing high incidence rates for mammary carcinoma. As no passive immunotherapy has been developed so far for canine cancer, we aimed to investigate the applicability of cetuximab and trastuzumab specificities in this species.
Our homology search between human and canine ErbB family members revealed amino acid sequence identities of 91% for ErbB-1, 92% for ErbB-2, and a similarity of 95% for both. Modelling of the two molecules showed that the cetuximab epitope on human ErbB-1 differs in only 4 amino acids from the canine counterpart, and that the trastuzumab binding site is identical in human and canine ErbB-2, apart from a single amino acid. Indeed, cetuximab and trastuzumab binding to 4 canine mammary carcinoma cell lines could be confirmed by flow cytometry and immunoblot. Furthermore, screenings with FDA-approved immunohistochemical diagnostic tests of canine mammary tumor samples showed in 3/10 ErbB-1, and in 4/10 ErbB-2 overexpression, reminding of the expression pattern in human breast cancer patients. The results of an *in vitro* cell proliferation assay indicated that targeting with both antibodies inhibited tumor cell proliferation.
This comparative oncology approach indicates significant concordance of human and canine ErbB-1 and ErbB-2 molecules in terms of structure and expression patterns in mammary cancers. Importantly, the canine homologous molecules are susceptible to cetuximab and trastuzumab targeting, may open new avenues towards antibody-based immunotherapies in companion dogs.

Artemisinin resistance in Asia.
No indication that resistance has reached Bangladesh.

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Only a few years ago, it was asserted by some that artemisinin resistance in malaria was unlikely to emerge soon. However, a clinical trial conducted in 2006/2007 along the Cambodian-Thai border and follow-up trials on the east and west Thai-border provided evidence of clinical resistance to artemisinin derivatives, currently the most essential class of antimalarial drugs. Southeast Asia has traditionally been a focus of antimalarial drug resistance development from which resistance has previously spread to South Asia and Africa. In terms of antimalarial drug resistance Bangladesh forms a gateway to the Indian subcontinent with its millions of malaria cases annually.

We conducted an open-label, randomized, controlled 42-day clinical trial in Southeastern Bangladesh to investigate the potential spread of clinical artemisinin resistance from Southeast Asia. A total of 126 uncomplicated falciparum malaria patients were randomized to one of 3 treatment arms (artesunate monotherapy with 2 or 4 mg/kg/day once daily or quinine plus doxycycline TID for 7 days). Only cases fulfilling a stringent set of criteria were considered as being artemisinin-resistant.

The 28-day and 42-day cure rates in the artesunate monotherapy (2 and 4 mg/kg) and quinine/doxycyline arms were 97.8% (95% CI: 87.8 – 99.8%), 100% (91.1 – 100%), and 100% (83.4 – 100%), respectively. One case of re-infection was seen in the artesunate high dose arm, and a single case of recrudescence was observed in the low dose group on day 26. No differences in median parasite and fever clearance times were found between the 2 artesunate arms (29.8 h and 17.9 h vs. 29.5 h and 19.1 h). No serious adverse events were observed.

Not a single case fulfilled our criteria of artemisinin resistance. PCTs were considerably shorter and *in vitro* results indicate significantly higher susceptibility to artemisinins as compared to Southeast-Asia. There was also no indication of compromised intrinsic drug sensitivity to artemisinins and treatment response was not dose-dependent. The phenotype observed in the course of this study is thus likely to be representative of Asian *P. falciparum* populations before the introduction of artemisinins. So far artemisinins have not been used on any significant scale in Bangladesh and the situation is likely to change in the future, either due to resistance spreading from Southeast Asia or due to de novo emergence of resistance under drug pressure.

The polyene macrolide drug pentamycin is highly effective against *Trichomonas vaginalis*

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Trichomonas vaginalis is the causative agent of the most prevalent non-viral sexually transmitted disease with more than 170 million new cases per year. Although trichomonosis is not a primarily lethal disease, the progression of the disease can be prolonged and severe. Chronic infections have been associated with cervical/prostate cancer and a predisposition for HIV infection. In case of pregnancy, infection can lead to preterm delivery and low birth weight. Metronidazole has been the drug of choice since the 1960ies, but emerging resistances are pushing the search for alternative drugs.
In the current study, the efficacy of a newly patented form of the polyene macrolide drug pentamycin against *T. vaginalis* was evaluated using a microtiter plate system and four strains with different metronidazole resistances. Moreover, the susceptibility of trichomonads under resistance stress was revealed by establishing a long-term treatment with sublethal concentrations.
Generally, trichomonads treated with pentamycin showed cell lysis or changes in shape and structure. The four differently metronidazole-sensitive strains showed almost identical susceptibilities. EC_{50}ies were all below 3 µg/ml, which is remarkably low compared to metronidazole. EC_{90}ies of the four strains ranged from 4,9 to 6,5 µg/ml and a 100% eradication of trichomonads was reached with a concentration of 15 µg/ml pentamycin within 1h. Resistance against pentamycin was not induced, even after 1 year of permanent sublethal treatment.

Altogether, this study established the efficacy of pentamycin against *Trichomonas vaginalis*, particularly the susceptibility of metronidazole-resistant strains to pentamycin is promising. Moreover, pentamycin has also been shown to be active agains fungal vaginitis and co-infections with bacteria.

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Ectoparasites of Rodent Hosts from the Chittagong Hill Tracts in Southeastern Bangladesh

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Rodents are one of the widest distributed and most successful groups of mammals worldwide. A high variety of ectoparasites parasitizing on muride hosts are known, of which several are proven to be vectors of important zoonotic diseases affecting humans (e.g. bubonic plague and murine typhus which are transmitted by tropical rat flea).
The study was conducted at the MARIB field site in Bandarban, Chittagong Hill Tracts, Bangladesh in August 2011. Ectoparasites of more than 70 muride hosts were collected, stored in 70% ethanol and classified microscopically. In this preliminary study one flea species and several mite species were documented. Further studies concerning the presence of pathogens in ectoparasites of rodents in the Chittagong Hill Tracts are of urgent need, as the vast majority of the population of this region is at risk of a variety of zoonotic diseases.

Microbial Contamination of Contact Lens Storage Cases and Domestic Tap Waters

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Contact lenses are widely used both, in developed and developing countries, as an alternative to spectacles. However, adverse responses can occur during contact lens wear and moreover, several microorganisms, including bacteria, fungi and free living amoebae, can cause eye infections in wearers. Microbial keratitis may result in permanent visual loss. Risk factors include contact lens wear, contaminated lens storage cases, tap water use and low hygiene. In the current study, presence of total aerobic mesophilic bacteria (TAMB), Gram negative rod bacteria (GNRB), *Pseudomonas* type bacteria, fungi and free-living amoebae (FLA) was investigated in contact lens storage cases and domestic tap waters from 50 contact lens wearers. Age, sex, contact lens type, storage case usage time, etc. of contact lens wearers were recorded to investigate the relationship to microbial contamination.
TAMB were isolated in 45 (90%), GNRB were isolated in 20 (40%), *Pseudomonas* spp. were isolated in 2 (4%) and fungi were isolated in 18 (36%) out of 50 contact lens storage cases. No FLA were detected in the storage cases. Out of the 50 domestic tap water samples, TAMB were isolated in 34 (68%), fungi were isolated in 15 (30%) and FLA were isolated in 15 (30%). No GNRB and *Pseudomonas* type bacteria were detected in these waters. Two contact lens case samples and two tap water samples were excluded from the analysis for *Pseudomonas* spp. for technical reasons.
According to our findings, inadequate contact lens maintenance during contact lens wear may result in the contamination of contact lens storage cases. Consequently, pathogenicity tests should be applied to the isolated FLA and further studies should be performed investigating contact lens storage cases and domestic tap waters from contact lens wearers with eye infections.

Immunomodulation of allergic immune responses by *Toxoplasma gondii* derived antigens

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Previously we demonstrated that infection with *Toxoplasma gondii* before and after allergic sensitisation reduced allergic immune responses. In the present study we investigated whether *T. gondii* oocyst lysate antigen (OLA) maintains the immunomodulatory potential as we observed it in our model of *T. gondii* infection.
BALB/c mice were immunised with OLA and thereafter sensitised against the major birch pollen (BP) allergen, Bet v 1, and aerosol challenged with birch pollen extract.
Application of the *T. gondii* derived OLA led to high parasite-specific IgG antibody levels in serum. Pre-treatment with OLA resulted in diminished levels of allergen-specific IgE versus elevated IgG2a antibodies. IL-5 levels were reduced in the OLA immunised group compared to the sensitised controls upon BP stimulation of splenocytes *in vitro*. Immunisation with OLA led to decreased IL-5 production and increased IFN-gamma production in lung cells incubated with BP compared to the sensitised controls. Interestingly, a transfer of splenocytes from OLA immunised mice into naïve and thereafter sensitised mice reduced allergic immune responses and airway-inflammation.
Thus we conclude that not only infection with *T. gondii* but also administration of OLA result in the modulation of allergic immune responses. Currently we investigate the mechanisms underlying this immunomodulation. It is further planed to identify and characterise the molecules responsible for the immunomodulation as well as the underlying mechanisms of allergy suppression.

Intestinal Protozoa: Clinics versus Lab

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Intestinal protozoa are common causes of abdominal pain, diarrhea and malabsorption. Patients are usually without fever but, depending on the involved pathogen, complain about frequent rectal tenesmus, nausea, bloating and eructation. The spectrum of symptoms varies from asymptomatic to life-threatening infections. *Giardia duodenalis* and *Cryptosporidium* spp. affect the small intestine and have their major impact in children, *Entamoeba histolytica* is a colon parasite and disease progression is generally even more severe in adults. Stool may be watery as in giardiosis or cryptosporidiosis or contain blood and mucous as in amoebic dysentery. Several intestinal protozoa are classical opportunists, *Cryptosporidium* spp., *Isospora belli* or the fungi-related microsporidia are well-known examples, and in some cases infections can also disseminate to other organs.

The identification of intestinal protozoan pathogens still mainly relies on microscopy, however, parasitological expertise is essential: low parasite density and/or morphologic variability can result in false negative results, pseudo-parasites and artefacts are common causes of false positive results. As parasite density in stool may not be constant, the collection of repeated samples is often essential. In the past years, molecular methods, particularly PCR-based techniques, have gained more and more importance. Big advantages of these techniques are higher sensitivity and that they usually allow identification below the genus level, which is often impossible by light microscopy. Rapid tests detecting parasitic antigens are available for *Cryptosporidium* spp. and *Giardia duodenalis*. These serve well for uncomplicated use, e.g. in the field setting, but should not replace laboratory diagnosis. This presentation gives an overview on human intestinal protozoa with a focus on major clinical symptoms and corresponding diagnostics.

Carcinoembryonic antigen: Challenging biomarker in comparative medicine

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Malignant mammary tumors represent the most common group of neoplasm in female dogs with frequent incidence of tumor-related death due to recurrence or metastases. It has been proven that similarities between human breast cancer and canine mammary cancer exist with respect to pathogenesis, tumor marker profile, genetic alterations and metastatic behavior. Therefore, naturally occurring mammary tumors in pet dogs may serve as relevant model to improve the understanding of cancer biology and to support drug development. In humans, carcinoembryonic antigen (CEA, CEACAM5) is widely used as tumor marker because of its overexpression in many types of cancer with simultaneously relatively restricted expression in healthy cells. This feature makes CEA the objective of several immunotherapeutical approaches. It is assumed that soluble CEA interacts with the recently discovered carcinoembryonic antigen receptor (CEAR) and may, therefore, mediate prometastatic properties. In line with the 'Comparative medicine strategy' the aim of this study was to investigate the function of CEA and CEAR in canine cancer cells, their possible role as targets for immunotherapy and the similarities to the human counterparts.

Voraussichtliche Änderungen des österreichischen Impfplans für 2012

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Pimp your parasite – fluorescence based imaging of *Isospora suis* in cell cultures

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The research on the biology of parasitic protozoa in their host cells requires established methods for the imaging of the parasites. In fixed samples fluorescence-conjugated specific antibodies can be used. In life-imaging requirements for dyes are more complex: parasites and host cells must be easily distinguishable; dyes or antibodies must not influence the physiological functions of cells and parasites and should be stable for a longer time. In contrast to coccidia of poultry and rodents, *Isospora suis*, the causative agent of neonatal porcine coccidiosis, cannot easily be genetically modified to express fluorescent reporter genes. This is caused by the size and requirements for housing of its host, the pig. The aim of the present study was the evaluation of different life-fluorescent dyes (CFSE, CMFDA, $DIOC_{18}$, PKH26) on sporozoites of *I. suis* for their usability in an *in vitro* model of neonatal porcine coccidiosis. Moreover, different antibodies (IMC3, A4B6, B1C4) were tested for the detection of *I. suis*-stages in samples fixed with different protocols.
CFSE and CMFDA were identified as appropriate dyes for short-term infection experiments in epithelial cells. None of the tested fluorescent dyes could be detected after 4 days post infection. IMC3 – a polyclonal antibody against the inner membrane complex of apicomplexa – revealed good staining results with intracellular *I. suis*-stages. Secondary goat anti-mouse-IgG antibodies showed a distinct binding to *I. suis*-stages with unknown causality. This result highlights the need for appropriate controls when testing monoclonal antibodies on intracellular parasites, especially on coccidia which are widespread – also among laboratory animals used for antibody production.

Pneumokokken im Alter – Jung vs. Alt

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