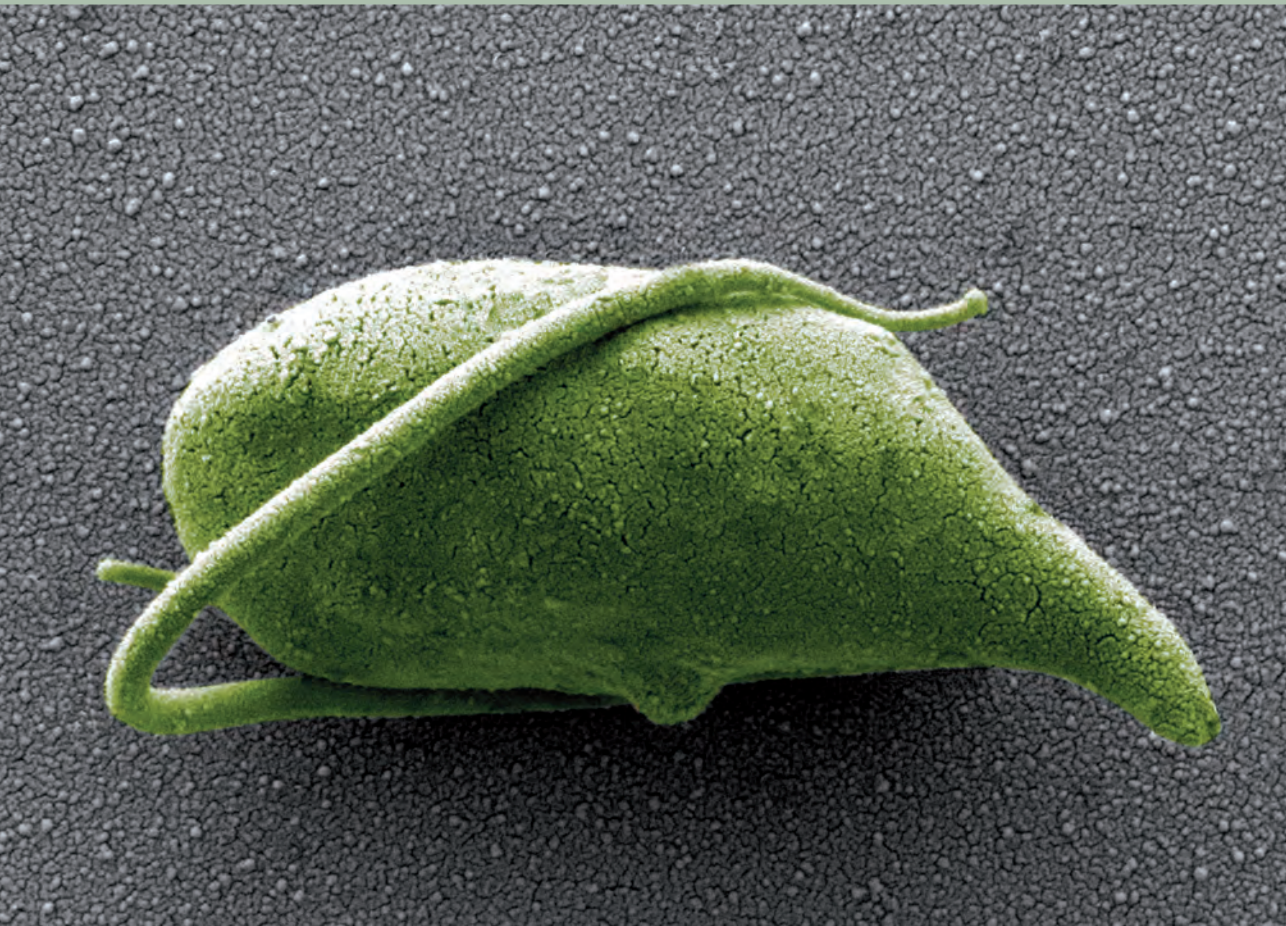
BIOLOGY CENTRE
OF THE ACADEMY OF SCIENCES
OF THE CZECH REPUBLIC, v.v.i.

Institute of Parasitology



BIENNIAL REPORT 2008–2009

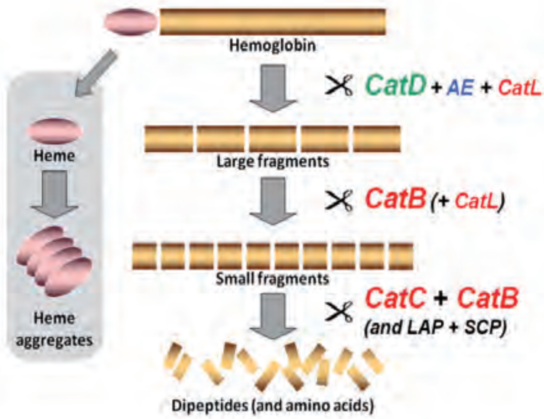


Figure 1. **Proteolytic pathway in tick hemoglobinolysis**

A schematic representation of proteolytic pathway of hemoglobin degradation in the digestive vesicles of *Ixodes ricinus* midgut cells. The endopeptidases, cathepsins D (CatD) supported by cathepsin L (CatL) and legumain (AE), are responsible for primary cleavage of hemoglobin. The production of secondary small fragments is dominated by endopeptidase activity of cathepsin B (CatB). The exopeptidases act on the peptides released by the action of the endopeptidases through carboxy-dipeptidase activity of CatB and amino-dipeptidase activity of cathepsin C (CatC). The monopeptidases including serine carboxypeptidase (SCP) and leucine aminopeptidase (LAP) might participate in the liberation of free amino acids. The enzymes are colour-coded according to membership in the AA clan aspartic peptidases (green), the CD clan cysteine peptidases (blue), the CA clan (papain-type) cysteine peptidases (red), and serine and metallo peptidases (black). The toxic heme moiety forms aggregates that accumulate inside the hemosome, a specialized organelle of the digestive cell.

From: Horn M., Nussbaumerová M., Šanda M., Kovářová Z., Srba J., **Franta Z.**, **Sojka D.**, Bogyo M., Caffrey C.R., **Kopáček P.**, Mareš M. 2009: Hemoglobin digestion in blood-feeding ticks: mapping a multipeptidase pathway by functional proteomics. *Chemistry & Biology* 16: 1053–1063.

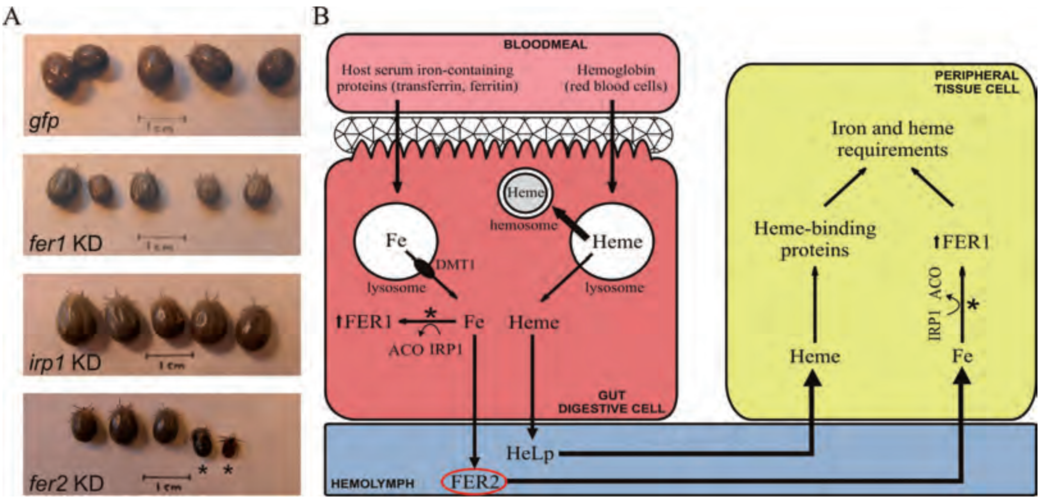


Figure 2. **Iron metabolism in ticks**

Panel A: Effect of RNA interference on the tick ability to feed on the host. gfp – ticks injected with control (GFP) double stranded RNA; fer1 KD – effect of intracellular ferritin 1 silencing; irp KD – effect of iron-regulatory protein (IRP) silencing; fer2 KD – effect of secreted ferritin 2 silencing.

Panel B: A model for iron and heme transport in ticks. Based on our results and work of Dr. Pedro L. Oliveira's laboratory (Rio de Janeiro), we assume two independent pathways for metabolism of heme (the blood pigment) and non-heme iron from the host blood. Silencing of ferritin 2 impairs transport of the non-heme iron, which is necessary e.g. for the respiratory enzymes. Moreover, the toxic iron is accumulated in the tick gut which in consequence have a severe impact on tick ability to feed and develop.

From: **Hajdušek O.**, **Sojka D.**, **Kopáček P.**, **Burešová V.**, **Franta Z.**, Šauman I., Winzerling J., **Grubhoffer L.** 2009: Knockdown of proteins involved in iron metabolism limits tick reproduction and development. *Proceedings of the National Academy of Sciences, USA* 106: 1033–1038.

Front cover: Flagellated stage of *Chromera velia*, the closest known photosynthetic relative to apicomplexan parasites

ISBN 978-80-254-7194-4

Institute of Parasitology

Biology Centre of the Academy of Sciences of the Czech Republic, v.v.i.

Biennial Report

A Brief Survey of the Institute's Organisation and Activities

2008 – 2009

Contents

Structure of the Institute

(*As of 1 January 2010*)

Director
(*Tomáš SCHOLZ*)

Deputy Director
(*Jan Kopecký*)

Administrative and technical services

Department of Protistology

- **Laboratory of Fish Protists** (*Iva Dyková*)
- **Laboratory of Veterinary and Medical Protistology** (*Martin Kváč*)

Department of Molecular Parasitology

- **Laboratory of Molecular Biology of Protists** (*Julius Lukeš*)
- **Laboratory of Molecular Genetics of Nematodes** (*M. Asahina-Jindrová*)
- **Laboratory of Molecular Taxonomy** (*Miroslav Oborník*)
- **Laboratory of Functional Biology of Protists** (*Alena Zíková*)

Department of Helminthology

- **Laboratory of Helminthology** (*Tomáš Scholz*)
- **Laboratory of Molecular Helminthology** (*Jan Dvořák*)

Department of Molecular Ecology of Parasites

- **Laboratory of Molecular Biology of Vectors and Pathogens*** (*Libor Grubhoffer*)
- **Laboratory of Vector Immunology** (*Petr Kopáček*)
- **Laboratory of Molecular Phylogeny and Evolution of Parasites*** (*Václav Hypša*)

Folia Parasitologica
(*Vladimír Bukva*)

Scientific Council

Julius Lukeš (Chairman)
Libor Grubhoffer
Petr Kopáček
Jan Kopecký
David Modrý
Miroslav Oborník

External members
Milan Gelnar
Petr Horák
Petr Volf

Department of Parasite Immunology

- **Laboratory of Vector-Host Interactions** (*Jan Kopecký*)
- **Laboratory of Vector Genomics and Proteomics** (Michalis Kotsyfakis)

Supporting Facilities

- **Laboratory of Electron Microscopy** (*Jana Nebesářová*)
- **Animal Facility** (*Tomáš Douda*)

***Joint research unit of**
Institute of Parasitology and Faculty of Science, University of South Bohemia

Mission statement

The Institute of Parasitology, Biology Centre of Academy of Sciences of the Czech Republic, v.v.i. (public research institution), performs research on human and animal parasites at the organismal, cellular and molecular levels. Its mission is to acquire, advance and disseminate knowledge of the biology and host relationships of parasitic protists and related eukaryotic microorganisms, helminths and arthropods. The Institute pursues this goal through research, education and other activities at both the national and international levels. The results obtained have contributed to the prevention and control of human and animal parasitic diseases and have an impact on human health and agriculture, including fisheries.

The Institute of Parasitology was established in Prague in 1962, but was relocated to České Budějovice in South Bohemia in 1985. It is the principal institution in the Czech Republic devoted exclusively to parasitological research. The main research areas encompass protistology, helminthology and medical entomology, including studies on the causative agents of the infections transmitted by arthropods.

Research areas

The mission of the Institute of Parasitology is primarily research in parasitology, with a focus on obtaining and presenting new information about the biology of the causative agents of parasitic diseases of man and animals. The main areas representing the priorities of the Institute's research are listed below:

1. **Parasites of fish**
   - Morphology, molecular taxonomy and pathogenicity of amphizoic amoebae
   - Life cycles, ultrastructure and phylogeny of myxosporeans and microsporidia
   - Systematics, biology and ecology of helminth parasites related to the aquatic environment

2. **Molecular biology of parasitic protists and nematodes**
   - Functional genomics of the mitochondrion of the flagellate *Trypanosoma brucei*
   - Population structure of the causative agents of leishmaniosis in Europe
   - Secondary endosymbiosis and evolution of plastids
   - Genetic analysis of the nuclear receptor function in the model nematode *Caenorhabditis elegans*

3. **Biology of disease vectors: molecular interactions involved in pathogen transmission**
   - Immunology of host-vector interactions with respect to pathogen transmission
   - Molecular and cellular factors of pathogen transmission in ticks
   - Molecular ecology of Lyme borreliosis and tick borne encephalitis with respect to their antigenic structures and protein-carbohydrate interactions

4. **Molecular taxonomy and phylogeny of parasites**
   - Phylogeny of parasitic protists, helminths and arthropods, as well as host-parasite coevolution
   - Parasite distribution and host specificity as the result of coevolutionary and host-switching events
   - Molecular phylogeny of the bacteria associated with blood-feeding arthropods

5. **Parasitic protists of man and animals with a special focus on opportunistic parasites**
   - Human parasites with special attention to emerging opportunistic parasites
   - Biology, pathogenicity and phylogenetic relationships of coccidia
   - Immune response against microsporidia

Publishing

The Institute of Parasitology publishes the international journal *Folia Parasitologica*. It is issued quarterly and publishes contributions from all branches of parasitology.

Facilities and capabilities

The laboratories of the Institute of Parasitology are well equipped with instruments to perform a vast array of methods, such as scanning and transmission electron microscopy, histopathology, biochemistry, molecular biology, plus facilities for tissue and cell cultures. Its facilities make it possible to study host-parasite interactions at the organismal, cellular and molecular levels. The Institute of Parasitology's research activities are augmented by equipment available in other research institutes within the Biology Centre of the Academy of Sciences of the Czech Republic, v.v.i., in České Budějovice. The Institute also possesses an animal facility accredited for experiments with laboratory animals and it has been approved for work with genetically modified organisms.

The Institute of Parasitology maintains cultures of parasitic protists, cell lines and laboratory colonies of ticks and mosquitoes. Extensive collections of type and voucher materials (about 3,000 species of protists, helminths and parasitic arthropods) are also deposited at the Institute of Parasitology.

Education

The Institute of Parasitology has a close relationship with the Faculty of Science, University of South Bohemia in České Budějovice. The staff of the Institute is engaged in teaching activities in both Master and PhD programs at the University. The practical research experience and theses of undergraduate and graduate students of the Faculty of Science are facilitated by the established research programs of the Institute.

The Institute of Parasitology is also involved in undergraduate and graduate teaching at the Charles University in Prague, Masaryk University in Brno and the University of Veterinary and Pharmaceutical Sciences in Brno. The Institute endorses doctoral programs in parasitology, molecular and cellular biology and zoology at the Faculty of Science of the University of South Bohemia, and it has also been licensed for doctoral studies in parasitology for the Faculty of Science, Charles University in Prague.

The Institute of Parasitology offers opportunities for postdoctoral and residency training in parasitology. The staff also organizes international training courses and its researchers participate as lecturers in parasitology courses abroad.

Other activities

An integral part of the Institute's activities is the organisation of scientific events such as international symposia and workshops. Scientists of the Institute provide expert opinions to national and international agencies, professional societies and scientific grant agencies. Researchers of the Institute also serve as members of editorial and advisory boards of international journals, in addition to being referees of peer-reviewed journals.

Department of Eukaryotic Microorganisms Infecting Fish

Head: **Iva DYKOVÁ**

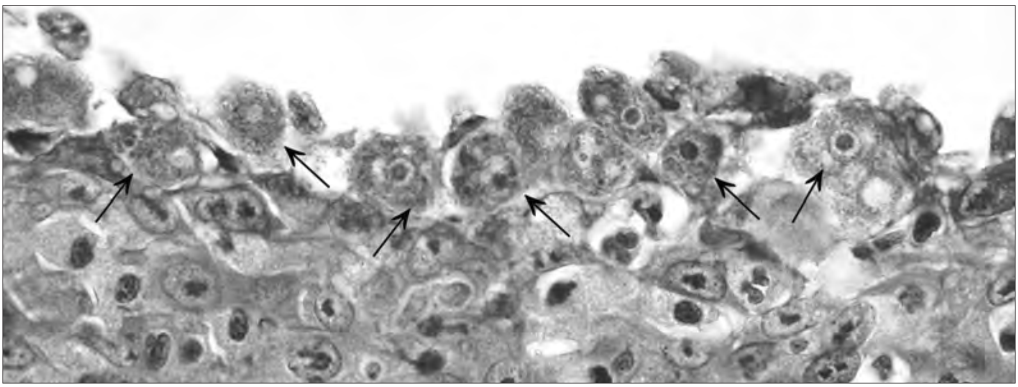
Research scientists:	Prof. MVDr. **Iva DYKOVÁ**, DrSc. RNDr. **Ivan Fiala**, Ph.D. (part time) RNDr. **Jiří Lom**, DrSc. (passed away on 9 April 2010)
Ph.D. students:	RNDr. **Pavla Bartošová**, Mgr. **Jana Bendová** (till March 2008)
Research assistants:	Ing. **Helena Dvořáková** (part time), RNDr. **Hana Pecková**
Technician:	**Marie Fučíková**
Laboratory worker:	**Ivana Reitingerová**
Undergraduate student:	**Tomáš Tyml**

Research priorities

Eukaryotic microorganisms infecting fish, including all aspects of their structure, biology and relation to the hosts, with special attention given to phylogenetic relationships of myxosporea, microsporidia and amoeboid organisms infecting fish.

Amoeboid protists as parasites of fish

The study of free-living amoebae as potential pathogens of fish is ongoing, using light microscopical, ultrastructural and molecular methods. We discovered a novel symbiotic association of eukaryotic organisms, *Thecamoeba hilla* and *Labyrinthula* sp., displaying signs of mutualistic symbiosis. A comparative study of amoeba strains of the family Flabellulidae revealed difficulties in their generic assignment. Sequences of SSU rDNA of our strains filled in a gap in GenBank, supported mutual relatedness of strains isolated from fish and marine invertebrates and uncovered the affiliation of flabellulid strains to the Leptomyxida. A new



An example of severe infection of rainbow trout gills caused by amphizoic amoebae (arrows) firmly attached to the surface of epithelium. Histological section stained with H&E, × 740.

genus, *Grellamoeba*, was erected and its type species, *G. robusta*, described from a strain isolated from kidney tissue of the pikeperch, *Sander lucioperca*. *Legionella* sp. closely related to *L. micdadei*, the Pittsburgh pneumonia agent, was detected in the cytoplasm of trophozoites and cysts of *Filamoeba* sp. isolated from 56 °C water within a piping system.

Fish microsporidia

An overview of microsporidian infections of fish, focused on host-parasite relationships and microsporidia-caused lesions at the cellular and tissue level, was presented by J. Lom as a chapter in Fish Diseases (Volume 1, Chapter 8), edited by J.C. Eiras, H. Segner, T. Wahli and B.G. Kapoor (Science Publishers, Enfield, NH).

Myxosporea

Evolutionary trends within myxosporean lineages were investigated with the use of 35 new LSU rDNA sequences. Phylogenetic analyses have shown a good agreement between the SSU and LSU ribosomal genes. The main phylogenetic split between freshwater and marine lineages was confirmed. The informative superiority of the LSU rDNA data was proven by an increase in the resolution, nodal supports and tree indexes in a single LSU rDNA and combined analyses. The D5 3′-end part of the LSU rRNA gene was chosen as the most phylogenetically informative region. Concatenation of these data with the complete SSU rDNA data provides a well resolved and robust tree. Specific primer sets for the D5 3′-end part of the LSU rDNA were designed for simple amplification of this marker.

Selected publications

- **Bartošová P.**, **Fiala I.**, Hypša V. 2009: Concatenated SSU and LSU rDNA data confirm the main evolutionary trends within myxosporeans (Myxozoa: Myxosporea) and provide effective tool for their molecular phylogenetics. *Molecular Phylogenetics and Evolution* 53: 81–93. [IF = 3.556]
- **Dyková I.** 2008: Amoeboid protists as parasites of fish. In: J.C. Eiras, H. Segner, T. Wahli and B.G. Kapoor (Eds.), Fish Diseases. Vol. 1, Chapter 8. Science Publishers, Enfield, New Hampshire, USA, pp. 397–420.
- **Dyková I.**, **Fiala I.**, **Dvořáková H.**, **Pecková H.** 2008: Living together: the marine amoeba *Thecamoeba hilla* Schaeffer, 1926 and its endosymbiont *Labyrinthula* sp. *European Journal of Protistolog*y 44: 308–316. [IF = 1.000]
- **Dyková I.**, **Fiala I.**, **Pecková H.**, **Dvořáková H.** 2008: Phylogeny of flabellulids inferred from SSU rDNA sequences of the type strain of *Flabellula citata* Schaeffer, 1926 and newly isolated strains of marine amoebae. *Folia Parasitologica* 55: 256–264. [IF = 1.307]
- **Dyková I.**, **Pecková H.**, **Kostka M.** 2008: Morphology and SSU rDNA-based phylogeny of a new strain of *Saccamoeba* sp. (*Saccamoeba* Frenzel, 1892, Amoebozoa). *Acta Protozoologica* 47: 397–405. [IF = 1.013]

Research projects

- **Phylogenetic relationships within Myxosporea inferred from combined analysis of ribosomal and protein gene sequences: evolution of important fish parasites.** Grant Agency of the Academy of Sciences of the Czech Republic (KJB600960701; P.I.: I. Fiala; 2007–2009)
- **Phylogenetic analysis of mitochondrial genome of Myxozoa and *Polypodium hydriforme*.** Grant Agency of the Czech Republic (204/09/P519; P.I.: I. Fiala; 2009–2011)
- **Generic and species characterisation of fish-isolated amoebae focused on molecular markers as tools for diagnosis of amoebae in tissue lesions.** Grant Agency of the Czech Republic (524/09/0137; P.I.: I. Dyková; 2009–2011)

Department of Medical and Veterinary Parasitology

Head: **Oleg DITRICH** (till December 2008)

Laboratory of Opportunistic Parasites

Head: **Martin KVÁČ** (since January 2009)

Laboratory of Veterinary and Medical Protistology

Research scientists:	Doc. RNDr. **Oleg Ditrich**, CSc. (since January 2009 part time) Prof. MVDr. **Břetislav Koudela**, CSc. (part time) Doc. Ing. **Martin Kváč**, Ph.D. Doc. MVDr. **David Modrý**, Ph.D. (part time) RNDr. **Bohumil Sak**, Ph.D. Prof. RNDr. **Jiří Vávra**, DrSc. (part time)
Research assistant:	RNDr. **Dana Květoňová**
Undergraduate students:	Bc. **Marie Jalovecká**, Bc. **Martina Jeníková**, Bc. **Denisa Kašičková**, Bc. **Alena Kodádková**, Bc. **Michaela Kotková**, Bc. **Linda Matoušová**, Bc. **Lenka Moravcová**, Bc. **Zuzana Ondráčková**, **Iva Formbaumová**, **Nikola Hromadová**, **Jitka Kociánová**, **Eva Mišková**, **Zuzana Papáčková**, **Markéta Pelikánová**, **Lenka Rousková**, **Eliška Šrámková**, **Pavla Wagnerová**, **Petra Zajíčková**

Research priorities

To determine the zoonotic sources of emerging parasitic diseases, especially the opportunistic nature of the occurrence of cryptosporidia, microsporidia and giardia in wild and domestic animals, as well as in immunodeficient (e.g. AIDS) and immunocompetent patients.

Immune response in gastric mucosa during *Cryptosporidium muris* infection

Although there is a paucity of T-cells presented in the gastric mucosa of healthy rodent hosts, significantly elevated migration of T-cells (more than 10,000 fold), especially the CD8+ T-lymphocytes, to the stomach mucosa occurred during primary infection and persisted for more than two months after its resolution. Most immunocompetent hosts recovered during 35 days post infection (DPI) without treatment. The *ex vivo* cultures of splenocytes revealed very low levels of IFN-γ production during the course of primary infection. These infected animals acquire protective immunity against re-infection with the same or another gastric *Cryptosporidium*. No cross immunity between gastric *Cryptosporidium* species of mammals and *C. parvum* has been detected. Hosts with CD8+ or CD4+ T-cells deficiency suffered from chronic cryptosporidiosis; nevertheless, they were able to recover independently within 150 DPI.

Epidemiology of cryptosporidiosis and microsporidiosis in farm animals

Pig cryptosporidiosis has been described in all age categories. *Cryptosporidium suis* and *Cryptosporidium* pig genotype II are the dominant species in pigs. A very low occurrence of *C. parvum* in pigs has been recorded, but this species and *C. andersoni* were dominant in cattle younger than two months of age and adult animals, respectively. *Cryptosporidium bovis* was found with very low prevalence and *C. ryanae* was not detected in cattle. All *C. parvum* isolates belonged to the subtype IIa. The susceptibility of adult rodents to *C. parvum* and sheep to *C. muris* has been proved experimentally. The first report of human infection with *Cryptosporidium* pig genotype II was reported. Whereas the occurrence of cryptosporidiosis in pig is dependent on breeding-hygiene, in cattle it is breeding type-dependent. Both cattle and pigs are a significant reservoir of microsporidia (*Encephalitozoon* and *Enterocytozoon*).

Selected publications

- **Kašičková D.**, **Sak B.**, **Kváč M.**, **Ditrich O.** 2009: Sources of potentially infectious human microsporidia: molecular characterization of microsporidia isolates from exotic birds in the Czech Republic, prevalence study and importance of birds in epidemiology of the human microsporidial infections. *Veterinary Parasitology* 165: 125–130. [IF = 2.278]
- **Kváč M.**, **Květoňová D.**, **Sak B.**, **Ditrich O.** 2009: *Cryptosporidium* pig genotype II in immunocompetent man. *Emerging Infectious Diseases* 15: 982–983. [IF = 6.794]
- **Kváč M.**, **Sak B.**, **Květoňová D.**, **Ditrich O.**, Hofmannová L., **Modrý D.**, Vítovec J., Xiao L. 2008: Infectivity, pathogenicity, and genetic characteristics of mammalian gastric *Cryptosporidium* spp. in domestic ruminants. *Veterinary Parasitology* 153: 363–367. [IF = 2.039]
- Refardt D., Decaestecker E., Johnson P.T.J., **Vávra J.** 2008: Morphology, molecular phylogeny, and ecology of *Binucleata daphniae* n. g., n. sp. (Fungi: Microsporidia), a parasite of *Daphnia magna* Straus, 1820 (Crustacea: Branchiopoda). *Journal of Eukaryotic Microbiology* 55: 393–408. [IF = 1.502]
- **Sak B.**, **Kváč M.**, Hanzlíková D., Cama V. 2008. First report of *Enterocytozoon bieneusi* infection on a pig farm in the Czech Republic. *Veterinary Parasitology* 153: 220–224. [IF = 2.039]

Research projects

- **Immune response of mice to infection with different gastric cryptosporidia from mammals.** Grant Agency of the Academy of Sciences of the Czech Republic (KJB500960701; P.I.: M. Kváč; 2007–2009)
- **Zoonotic potential of *Cryptosporidium* species infecting cattle and pigs.** Grant Agency of the Czech Republic (523/07/P117; P.I.: M. Kváč; 2007–2009)
- **Impact of contact with humans on diversity and ecology of protozoan parasites of African great apes.** Grant Agency of the Czech Republic (206/09/0927; P.I.: D. Modrý, Co-I.: M. Kváč; 2009–2011)
- **Microsporidia as emerging pathogens of mammals and humans: search for the original hosts.** Grant Agency of the Czech Republic (524/07/1003; P.I.: B. Koudela, Co-I.: J. Vávra; 2007–2009)

Laboratory of Coccidia

Research scientist: RNDr. **Michal PAKANDL**, CSc. (*head*)
Research assistant: Ing. **Lenka Hlásková** (part time)
Technician: **Marie Kreimová** (part time)
Undergraduate student: Bc. **Alena Jelínková**

Research priorities

The Laboratory of Coccidia has been working for many years on rabbit coccidia. Like in chicken coccidia, vaccination with live precocious lines is a promising method of coccidiosis control. Immune response to rabbit coccidiosis has been studied using *Eimeria flavescens* and *E. intestinalis*. The differences in the course of infection were described, as well as the dependence of the immune response to coccidiosis on the age of rabbit sucklings. Special attention was given to the endogenous development of rabbit coccidia.

The endogenous development of the rabbit coccidium *Eimeria exigua*

The coccidium *Eimeria exigua* from the European rabbit (*Oryctolagus cuniculus*) has been neglected for long time. Its endogenous development in domestic rabbits has been studied by means of light and electron microscopy. The first meronts appeared 72 hours post-inoculation (HPI), but a total of four asexual generations developed from 72 to 144 HPI. Meronts and gamonts were localized in the small intestine and the asexual stages successively moved from the duodenum to the ileum. All parasite stages were found exclusively in the epithelium of the walls and tops of the villi. Two types of meronts developing in parallel during the asexual phase were observed from at least the second generation. As in other rabbit coccidia, these forms corresponded to type A, which usually develops two polynucleate merozoites where endomerogony occurs, and type B, characterized by more numerous uninucleate merozoites arising by ectomerogony. This report is the first description of the endogenous stages of *E. exigua*.

Age-dependent immune response of suckling rabbits to coccidiosis

To study the immune response to coccidiosis, suckling rabbits were inoculated with oocysts of either *Eimeria intestinalis* or *E. flavescens*. Another group served as an uninfected control, and the rabbits were killed at the same age as their infected counterparts. Unlike the antibody response, parameters reflecting cellular immunity (total number of leukocytes in mesenteric lymph nodes, lymphocyte proliferation upon stimulation with specific antigen and the dynamics of CD4+ and CD8+ cell proportions in the intestinal epithelium at the specific site of parasite development) were significantly changed from about 25 days onwards. In contrast to rabbits infected with the weakly immunogenic coccidium *E. flavescens*, the proportions of CD4+ and CD8+ lymphocytes in intraepithelial lymphocytes from the site of parasite development were considerably changed after infection with the highly immunogenic species *E. intestinalis*. As the immune system of sucklings from about 25 days reacts to the infection, this age may be considered as suitable for vaccination.

Selected publications

- **Jelínková A.**, Licois D., **Pakandl M.** 2008: The endogenous development of the rabbit coccidium *Eimeria exigua* Yakimoff, 1934. *Veterinary Parasitology* 156: 168–172. [IF = 2.016]
- Kvičerová J., **Pakandl M.**, Hypša V. 2008: Phylogenetic relationships among *Eimeria* spp. (Apicomplexa, Eimeriidae) infecting rabbits: evolutionary significance of biological and morphological features. *Parasitology* 135: 443–452. [IF = 2.081]
- **Pakandl M.** 2009: Coccidia of rabbit: a review. *Folia Parasitologica* 56: 153–166. [IF = 1.266]
- **Pakandl M.**, **Hlásková L.**, Poplštein M., Chromá V., Vodička T., Salát J., Mucksová J. 2008: Dependence of the immune response to coccidiosis on the age of rabbit suckling. *Parasitology Research* 103: 1265–1271. [IF = 1.473]
- **Pakandl M.**, **Hlásková L.**, Poplštein M., Nevečeřalová M., Vodička T., Salát J., Mucksová J. 2008: Immune response to rabbit coccidiosis: a comparison between infections with *Eimeria flavescens* and *Eimeria intestinalis*. *Folia Parasitologica* 55: 1–6. [IF = 1.000]

Department of Molecular Parasitology

Head: **Julius LUKEŠ**

Laboratory of Molecular Biology of Protists

Research scientists:	Prof. RNDr. **Julius LUKEŠ**, CSc. (head) RNDr. **Milan Jirků**, **Hassan Hashimi**, Ph.D.
Ph.D. students:	**Piya Changmai**, MSc. (Thailand), **Shaojun Long**, MSc. (China), RNDr. **Zdeněk Paris**, Ing. **Zuzana Vávrová**, Mgr. **Zdeněk Verner**
Technician:	**Gabriela Cifreundová**
Undergraduate students:	Bc. **Lucie Novotná**, Bc. **Pavel Poliak**, Bc. **Jiří Týč**, **Lucie Hanzálková**, **Petr Růžička**, **Tomáš Skalický**

Research priorities

The primary interest is functional analysis of selected mitochondrial proteins of the kinetoplastid flagellate *Trypanosoma brucei*. Its mitochondrion is unique in many aspects and by knocking-down or knocking-in individual genes, we are trying to unravel their functions. We are also interested in the evolution and biodiversity of parasitic kinetoplastid, and we are also involved in the genotyping of European leishmaniases and designing new diagnostic approaches for their detection.

Functional analysis of RNA editing in *Trypanosoma brucei*

We have generated knock-down cell lines of *T. brucei* procyclics, in which numerous RNA binding proteins are down-regulated by RNA interference. We have shown that these proteins exist in at least two complexes (MRP1/2 and MRB1), which are involved in RNA editing, RNA processing and stabilization of mitochondrial transcripts. In a collaborative effort, we study protein interactions within these complexes, but also try to understand how RNA molecules are bound to them.

Analysis of dyskinetoplastic trypanosomes

The life cycle of *Trypanosoma brucei* involves a bloodstream stage (BS) in vertebrates and a procyclic stage (PS) in the tsetse fly vector. Partial (dyskinetoplastidy, Dk) or total loss (akinetoplastidy, Ak) of kinetoplast DNA (kDNA) locks the trypanosome in the BS form. Transmission between vertebrates becomes mechanical without PS and tsetse mediation. *Trypanosoma equiperdum* and *T. evansi* are agents of dourine and surra, diseases of horses, camels and water buffalos. We showed that both species are actually strains (subspecies) of *T. brucei*, which lost part (Dk) or all (Ak) of their kDNA. Currently, we are part of a consortium sequencing the genome of *T. b. evansi*. Furthermore, we are also analyzing the mitochondrial proteome of *T. b. evansi*.

Evolution and biodiversity of Kinetoplastida

Using conserved rRNA and protein-coding gene sequences, we are mapping biodiversity of kinetoplastid flagellates infecting insects and vertebrates. Moreover, we would like to shed light on the evolution of hallmark features of kinetoplastids, such as the extremely complex mitochondrial (= kinetoplast) genome and RNA editing. We would also like to understand the process of dyskinetoplastidy (loss of kinetoplast DNA), in particular its extent in species pathogenic for horses (*Trypanosoma equiperdum*) and possibly also for man (*T. evansi*).

Diagnostics and epidemiology of European leishmaniasis

In a collaborative effort sponsored by the EU, we mapped the species composition and population structure of the *Leishmania donovani* complex. Our focus is mostly on strains isolated from patients in various countries of the Mediterranean, but we are extending the analysis also to African and Indian strains. We have sequenced protein-coding genes and performed extensive RAPD analyses that provide novel information about geographic correlation, recombination and diversity of these pathogens. We have also designed species-specific and highly sensitive PCR assays that shall highly improve diagnostics of leishmaniases.

Selected publications

- **Hashimi H.**, **Číčová Z.**, **Novotná L.**, Wen Y.Z., **Lukeš J.** 2009: Kinetoplastid guide RNA biogenesis is dependent on subunits of the mitochondrial RNA binding complex 1 and mitochondrial RNA polymerase. *RNA* 15: 588–599. [IF = 5.198]
- **Lai D.-H.**, **Hashimi H.**, Lun Z.-R., Ayala F.J., **Lukeš J.** 2008: Adaptations of *Trypanosoma brucei* to gradual loss of kinetoplast DNA: *Trypanosoma equiperdum* and *Trypanosoma evansi* are petite mutants of *T. brucei*. *Proceedings of the National Academy of Science of the United States of America* 105: 1999–2004. [IF = 9.380]
- **Long S.**, **Jirků M.**, Ayala F.J., **Lukeš J.** 2008: Mitochondrial localization but not processing of human frataxin is essential for a rescue of frataxin deficiency in the excavate flagellate *Trypanosoma brucei*. *Proceedings of the National Academy of Science of the United States of America* 105: 13468–13473. [IF = 9.380]
- **Lukeš J.**, Leander B.S., Keeling P.J. 2009: Cascades of convergent evolution: the corresponding evolutionary histories of euglenozoans and dinoflagellates. *Proceedings of the National Academy of Sciences of the United States of America* 106 (Suppl. 1): 9963–9970. [IF = 9.432]
- Wohlgamuth-Benedum J.M., Rubio M.A.T., **Paris Z.**, **Long S.**, **Poliak P.**, **Lukeš J.**, Alfonzo J.D. 2009: Thiolation controls cytoplasmic tRNA stability and acts as a negative determinant for tRNA editing in mitochondria. *Journal of Biological Chemistry* 284: 23947–23953. [IF = 5.328]

Research projects

- **Functional analysis of mitochondrial proteins in *Trypanosoma brucei*.** Grant Agency of the Czech Republic (204/06/1558; P.I.: J. Lukeš; 2006–2008)
- **Characterization of a novel protein complex involved in RNA processing and editing in the mitochondrion of *Trypanosoma brucei*.** Grant Agency of the Czech Republic (204/09/1667; P.I.: J. Lukeš; 2009–2012)
- **The role of *Trypanosoma brucei* RNA binding proteins in mitochondrial transcript processing.** Grant Agency of the Academy of Sciences of the Czech Republic (IAA500960705; P.I.: J. Lukeš; 2007–2010)
- **Mitochondrion of *Trypanosoma brucei* enters the post-proteomic era.** Ministry of Education, Youth and Sports (ME09005; P.I.: J. Lukeš; 2009)
- **Construction of the new eukaryotic expression system.** Academy of Sciences of the Czech Republic (1QS600220554; P.I.: J. Lukeš; 2005–2008)
- **Model organisms as a key to the understanding of functions of disease-related human genes.** Ministry of Education, Youth and Sports (2B06129; P.I.: J. Lukeš; 2006–2011)

Laboratory of Molecular Genetics of Nematodes

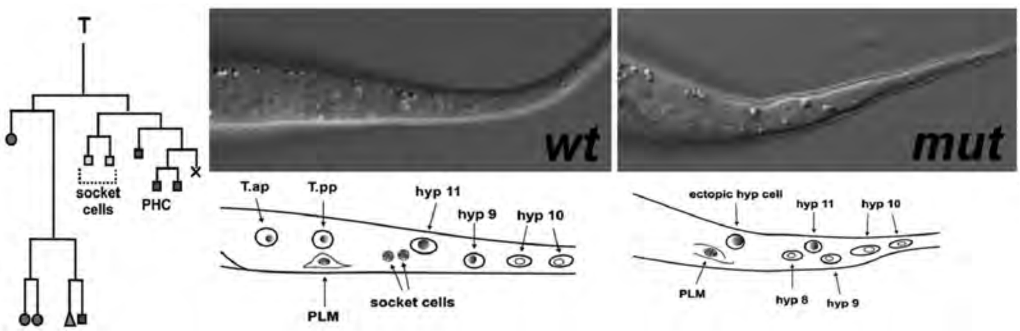
Research scientist:	**Masako ASAHINA-JINDROVÁ**, Ph.D. (*head*)
Ph.D. students:	Mgr. **Martina Hajdušková**, **Nagagireesh Bojanala**, MSc.
Undergraduate students:	Bc. **Linda Merglová**, Bc. **Alexandr Pospěch**, **Quynh Nguyen**

Research priorities

Asymmetric cell division and differentiation of cells are the keys to form a multicellular organism from a single cell. *Caenorhabditis elegans* provides us great tools to dissect the molecular mechanisms of these events genetically and to visually track cells at single-cell resolution during development. We are particularly interested in the role of the ancient nuclear receptor family NR5A (also called SF-1/LRH-1 in mammals, Ftz-F1 in invertebrates, amphibians, reptiles and fish, and NHR-25 in *C. elegans*) in cell differentiation and interaction with other important signaling cascades, such as Wnt/β-catenin, Runx and Ras pathways.

Cooperation of NHR-25 and Wnt signaling in epidermal T cell differentiation

Asymmetric cell divisions produce new cell types during animal development. Studies in *Caenorhabditis elegans* have identified major signal-transduction pathways that determine the polarity of cell divisions. How these relatively few conserved pathways interact and what modulates them to ensure the diversity of multiple tissue types is an open question. The Wnt/β-catenin asymmetry pathway governs polarity of the epidermal T-seam cell in the *C. elegans* tail. We show that the asymmetry of T-seam-cell division and morphogenesis of the male sensory rays require NHR-25, an evolutionarily conserved nuclear receptor. NHR-25 ensures the neural fate of the T-seam-cell descendants in cooperation with the Wnt/β-catenin asymmetry pathway. Loss of NHR-25 enhances the impact of mutated nuclear effectors of this pathway, POP-1 (TCF) and SYS-1 (β-catenin), on T-seam-cell polarity, whereas it suppresses the effect of the same mutations on asymmetric division of the somatic gonad precursor cells.



T-seam-cell polarity defect NHR-25-deficient worms

Therefore, NHR-25 can either synergize with or antagonize the Wnt/beta-catenin asymmetry pathway depending on the tissue context. Our findings define NHR-25 as a versatile modulator of Wnt/beta-catenin-dependent cell-fate decisions.

Role of NHR-25 in morphogenesis of the reproduction system

Morphogenesis of the vulva involves various genetical regulatory pathways such as EGF, Ras, MAPK, Notch, Runx and Wnt and it is a good model to study interaction and modulation of these pathways. When the function of NHR-25 is attenuated, the formation of the vulva is defective and we try to understand underling mechanism of this defect. We follow the morphology and the fate of the vulval cells utilizing various transgenes fused with a fluorescent protein such as GFP expressed in wild type and mutant live worms.

Selected publications

- **Hajdušková M.**, Jindra M., Herman M.A., **Asahina M.** 2009: The nuclear receptor NHR-25 cooperates with Wnt/β-catenin asymmetry pathway to control T cell differentiation in *C. elegans*. *Journal of Cell Science* 122: 3051–3060. [IF = 6.144]

Research projects

- **Crosstalk between nuclear receptor and Wnt signaling in *C. elegans*.** Grant Agency of the Academy of Sciences of the Czech Republic (204/07/0948, P.I.: M. Asahina-Jindrová; 2007–2011)
- **Intercellular signalling in development and disease.** Grant Agency of the Academy of Sciences of the Czech Republic (204/09/H058; P.I.: V. Bryja; Co-I.: M. Asahina-Jindrová; 2009–2012)
- **Model organisms as a key to understand function of genes essential for human health.** MODELGEN Ministry of Education, Youth and Sports (NPV II 2B06129, P.I.: J. Lukeš and M. Jindra; Co-I.: M. Asahina-Jindrová; 2006–2011)

Laboratory of Molecular Taxonomy

Research scientists:	Doc. Ing. **Miroslav OBORNÍK**, Ph.D. (head) Mgr. **Aleš Horák**, Ph.D. (part time)
Ph.D. students:	Mgr. **Kateřina Jiroutová**, Mgr. **Luděk Kořený**, Mgr. **Jitka Kručinská**
Undergraduate students:	Bc. **Jaromír Cihlář**, Bc. **Jan Janouškovec**, Bc. **Tomáš Vodička**, Bc. **Kateřina Voráčová**, **Julie Kovářová**

Research priorities

The Laboratory of Molecular Taxonomy (LMT) was established in 2000 as a joint unit of the Institute of Parasitology and Faculty of Biological Sciences (now Faculty of Science), University of South Bohemia. The laboratory is designed to study the molecular phylogeny of various organisms, and is supported by the Ministry of Education, Youth and Sports of the Czech Republic (CEZ AJ06/98 F1-123100003) and grants covering particular projects.

Chromerida, novel photosynthetic alveolates associated with corals

Novel photosynthetic alveolates were isolated from stony corals in Australia. We have investigated the morphology, composition of photosynthetic pigments and phylogeny of these enigmatic organisms. We proposed that the phylum Chromerida, and *Chromera velia* in particular, represent the closest known photosynthetic relatives to apicomplexan parasites (Moore & Oborník et al., 2008, Nature 451: 959–963; Oborník et al., 2009, IJP 39: 1–12). We are currently interested in their organellar genomes, ultrastructure and life cycle.

Diatom genomics

Diatoms are unicellular secondary algae responsible for at least 25% of global carbon fixation. We have previously participated on the annotation of the genome of the centric pennate *Thalassiosira pseudonana* (Armbrust et al., 2004; Science 306: 79–85). Recently, we have also been members of the annotation team of the pennate diatom *Phaeodactylum tricornutum* (Bowler et al., 2008). It has been shown that theses two diatoms substantially differ in their nuclear genomes. On the other hand, both diatoms contain many genes of bacterial origins obtained by horizontal gene transfer (HGT). Thanks to past endosymbioses and genes obtained by HGT, diatoms seem to acquire several metabolic novelties quite important for their evolutionary success.

Endosymbiotic gene transfer (EGT)

Endosymbiotic gene transfer is an indisseverable part of an endosymbiotic relationship, leading to the evolution of semiautonomous organelles. We are interested in genes in the process of endosymbiotic gene transfer, such as psb28 in diatoms. We investigate intracellular location of selected nuclear-encoded genes in diatoms by transfection of *P. tricornutum* with the gene in question fused with YFP. We are also interested in EGT of ancient eukaryotic genes, such as those coding for aminoacyl-tRNA synthetases.

Selected publications

- Moore R.B., **Oborník M.**, **Janouškovec J.**, Chrudimský T., Vancová M., Green D.H., Wright S.W., Davies N.W., Bolch C.J.S., Heimann K., Šlapeta J., Hoegh-Guldberg O., Logsdon J.M., Carter D.A. 2008: A photosynthetic alveolate closely related to apicomplexan parasites. *Nature* 451: 959–963. [IF = 31.434]
- Bowler C., Allen A.E., Badger J.H., Grimwood J., Jabbari K., Kuo A., Maheswari U., Martens C., Maumus F., Otillar R.P., Rayko E., Salamov A., Vandepoele K., Beszteri B., Gruber A., Heijde M., Katinka M., Mock T., Valentin K., Verret F., Berges J.A., Brownlee C., Cadoret J.-P., Chiovitti A., Choi C.-J., Coesel S., De Martino A., Detter J.C., Durkin C., Falciatore A., Fournet J., Haruta M., Huysman M.J.J., Jenkins B.D., **Jiroutová K.**, Jorgensen R.E., Joubert Y., Kaplan A., Kröger N., Kroth P.G., La Roche J., Lindquist E., Lommer M., Martin–Jézéquel V., Lopez P.J., Lucas S., Mangogna M., McGinnis K., Medlin L.K., Montsant A., Oudot–Le Secq M.-P., Napoli C., **Oborník M.**, Schnitzler Parker M., Petit J.-L., Porcel B.M., Poulsen N., Robison M., Rychlewski L., Rynearson T.A., Schmutz J., Shapiro H., Siaut M., Stanley M., Sussman M.R., Taylor A.R., Vardi A., von Dassow P., Vyverman W., Willis A., Wyrwicz L.S., Rokhsar D.S., Weissenbach J., Armbrust E.V., Green B.R., Van de Peer Y., Grigoriev I.V. 2008: The *Phaeodactylum* genome reveals the evolutionary history of diatom genomes. *Nature* 456: 239–244. [IF = 31.434]
- Coesel S., **Oborník M.**, Varela J., Falciatore A., Bowler C. 2008: Evolutionary origins and functions of the carotenoid biosynthetic pathway in marine diatoms. *PLoS ONE* 3 (8) e2896, 16 pp.
- **Oborník M.**, **Janouškovec J.**, Chrudimský T., Lukeš J. 2009: Evolution of the apicoplast and its hosts: from heterotrophy to autotrophy and back again. *International Journal for Parasitology* 39: 1–12. [IF = 3.819]

Research Projects:

- **Heme synthesis in Euglenozoa.** Grant Agency of the Czech Republic (206/08/1423, P.I.: M. Oborník, 2008–2010)
- ***Chromera velia* – newly discovered live photosynthtic ancestor of parasites of the group Apicomplexa.** Grant Agency of the Academy of Sciences of the Czech Republic (IAA601410907, Co-I.: M. Oborník, 2009–2012)

Department of Helminthology

Head: **Tomáš SCHOLZ**

Laboratory of Parasitic Flatworms

(since 1 January 2009 **Laboratory of Helminthology**)

Research scientists:	Prof. RNDr. **Tomáš SCHOLZ**, CSc. (*head*) RNDr. **Anna Faltýnková**, Ph.D., Mgr. **Miloslav Jirků**, Ph.D., **Aneta Kostadinova**, Ph.D. (Bulgaria; since June 2008), RNDr. **Roman Kuchta**, Ph.D., **Céline Levron**, Ph.D. (France), **Edgar F. Mendoza-Franco**, Ph.D. (Mexico; till August 2009), RNDr. **Mikuláš Oros**, Ph.D. and RNDr. **Martina Orosová**, Ph.D. (Slovakia), **Yuriy Kvach**, Ph.D. (Ukraine; till January 2009)
Ph.D. students:	**Anirban Ash**, MSc. (India; since June 2008), RNDr. **Jan Brabec**, **Carlos A. Mendoza-Palmero**, MSc. (Mexico; since June 2008), Mgr. **Miroslava Soldánová**
Research assistants:	Ing. **Radmila Řepová** (part time), Ing. **Blanka Škoríková**
Technician:	**Martina Borovková**
Undergraduate students:	Bc. **Andrea Bednářová**, Bc. **Alena Burianová**, Bc. **Petra Drobníková**, Bc. **Ivana Haasová**, Bc. **Dagmar Jirsová**, Bc. **Petra Rozkošná**, Bc. **Lenka Šípková**, Bc. **Romana Vlčková**, **Ondřej Máca**, **Eva Suchanová**

Research priorities

Morphology, including ultrastructure, systematics, ecology and the phylogeny of tapeworms (Cestoda), especially groups parasitic in fish, and ecology and life-cycles of trematodes (Digenea), with focus on communities of larval stages in freshwater molluscs.

Systematics of tapeworms (Cestoda)

Several groups of presumably the most basal groups of "true" tapeworms (Eucestoda) have been revised based on evaluation of newly collected or museum materials. Revision of the newly erected order Bothriocephalidea, which consists of 46 genera (seven genera proposed as new), was carried out and a review of the human broad tapeworm, *Diphyllobothrium*, was prepared. A comparative study of the scoleces of the monozoic order Caryophyllidea, parasites of freshwater fish in the Palaearctic Region, made it possible to prepare a key to identification of all species based on their scolex morphology.

Ultrastructure of basal tapeworms

Using a combination of scanning and transmission electron microscopy, unique surface structures called microtriches have been studied in primitive groups of tapeworms. A very low diversity of microtriches, represented only by filitriches, exists in the most basal groups (Gyrocotylidea, Caryophyllidea, Spathebothriidea and Diphyllobothriidea), whereas filitriches and spinitriches are present in Bothriocephalidea. New ultrastructural data enables us to summarise all existing information to be used in future comparative analyses and phylogenetic studies; this may help considerably in unravelling the still unclear evolutionary history of tapeworms.

Ecology and systematics of trematodes (Digenea)

A survey of the species composition, host specificity and distribution of larval stages of trematodes in aquatic molluscs in Central Europe was compiled from our own samplings and data in the literature. Keys to identification of cercariae of trematodes parasitic in planorbid snails and the great pond snail *Lymnaea stagnalis* were provided as a basis for further studies, focused mainly on trematode communities in freshwater snails. Two genera of echinostomatid trematodes, *Patagifer* and *Petasiger*, were revised on the basis of taxonomic evaluation of type specimens and newly collected material.

Selected publications

- **Faltýnková A.**, Gibson D.I., **Kostadinova A.** 2008: A revision of *Petasiger* Dietz, 1909 (Digenea: Echinostomatidae) and a key to its species. *Systematic Parasitology* 71: 1–40. [IF = 1.125]
- **Kuchta R.**, **Scholz T.**, **Brabec J.**, Bray R.A. 2008. Suppression of the tapeworm order Pseudophyllidea (Platyhelminthes: Eucestoda) and the proposal of two new orders, Bothriocephalidea and Diphyllobothriidea. *International Journal of Parasitology* 38: 49–55. [IF = 3.752]
- **Levron C.**, Poddubnaya L.G., **Kuchta R.**, Freeman M., Wang Y.-H., **Scholz T.** 2008. Ultrastructure of the tegument of the cestode *Paraechinophallus japonicus* (Bothriocephalidea: Echinophallidae), a parasite of the bathypelagic fish *Psenopsis anomala*. *Invertebrate Biology* 127: 153–161. [IF = 1.217]
- **Scholz T.** 2008. Family Opisthorchiidae Looss, 1899. In: R.A. Bray, D.I. Gibson and A. Jones (Eds.), Keys to the Trematoda. Volume 3. CAB International, Wallingford, UK & The Natural History Museum, London, UK, pp. 9–49.
- **Scholz T.**, García H.H., **Kuchta R.**, Wicht B. 2009. Update on the human broad tapeworm (genus *Diphyllobothrium*), including clinical relevance. *Clinical Microbiology Reviews* 22: 146–160. [IF = 14.691]

Research projects

- **Research Centre "Ichthyoparasitology".** Ministry of Education, Youth and Sports of the Czech Republic (LC522; P.I.: T. Scholz; P.I. – Coordinator: M. Gelnar, Masaryk University, Brno; 2005–2010)
- **Trematodes (Digenea) of the family Echinostomatidae in Central Europe: species composition and revision of selected genera.** Grant Agency of the Czech Republic (524/07/P086; P.I.: A. Faltýnková, 2007–2009)
- **Ultrastructure of microtriches and evolution of primitive tapeworms (Cestoda).** Grant Agency of the Czech Republic (524/07/P039; P.I.: C. Levron; 2007–2009)
- **Revision of monozoic tapeworms (Cestoda: Caryophyllidea): a key to understanding the evolution of cestodes?** Grant Agency of the Czech Republic (524/08/0885; P.I.: T. Scholz; 2008–2012)
- **Host-parasite relationships and evolution of parasitism.** Grant Agency of the Czech Republic (206/09/H026 – project to support PhD studies; P.I.: T. Scholz; 2009–2012)
- **Origin and homology of attachment organs in lower tapeworms (Eucestoda).** Grant Agency of the Academy of Sciences of the Czech Republic (KJB600960902; P.I.: R. Kuchta; 2009–2011)
- **Fish parasites of the Turkana Lake, Kenya: a model for study of evolutionary processes and impact of abiotic factors.** Grant Agency of the Academy of Sciences of the Czech Republic (KJB600960813; P.I.: M. Jirků; 2008–2010)

Laboratory of Nematology

(till 31 December 2008)

Research scientists: RNDr. **František MORAVEC**, DrSc. (head)
Prof. Ing. **Vlastimil Baruš**, DrSc. (part time, till December 2008)

Technician: **Irena Husáková**

Laboratory worker: **Drahoslava Sukdoláková**

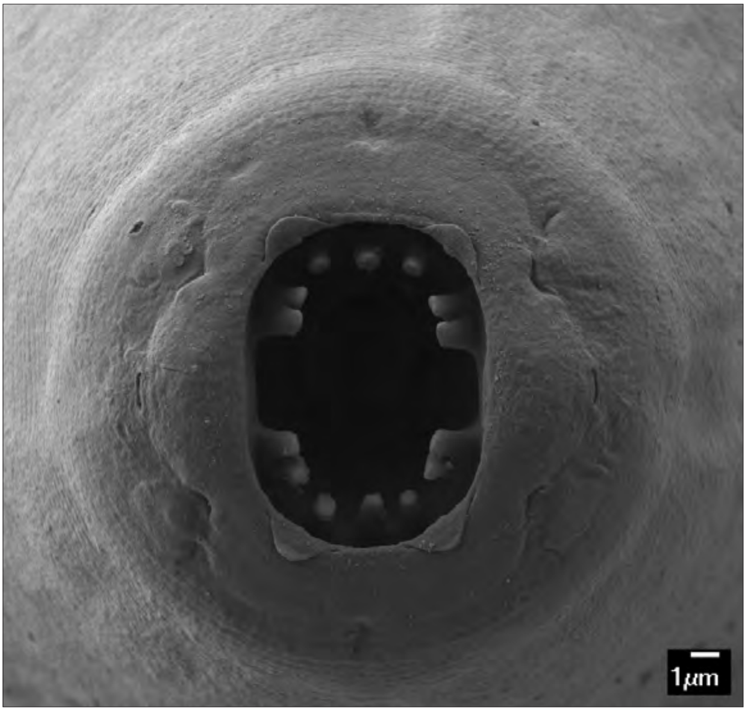
Undergraduate student: Bc. **Eva Černotíková**

Research priorities

Biology, life cycles, morphology, taxonomy and phylogeny of helminths, particularly nematodes, parasitic to fish and some other vertebrates. Classical methods, electron microscopy and genetic analyses are primarily used.

Comparative studies of spirurine nematodes parasitic in fishes

New discoveries were made for the morphological and biological diversity of spirurine nematodes parasitic in fishes, including philometrids affecting different body organs of commercial marine and freshwater fishes. Many species of these inadequately known parasites, particularly those



Cephalic end of the nematode *Rhabdochona hospeti*, intestinal parasite of *Tor* sp. in India of the families Philometridae, Cystidicolidae and Rhabdochonidae, were newly established or redescribed. DNA analyses of different members of the Spirurina elucidated interspecific relations and the phylogeny of these nematodes.

Biodiversity of nematode parasites of fishes in the tropics

With international cooperation, fish nematodes were evaluated from different countries, principally those where the diversity of parasitic organisms remains little known and ecosystems are seriously endangered, such as southern Mexico or the water drainage systems in South America and Africa. Many new or little-known taxa of fish nematodes, mainly from Mexico, Brazil, Kenya and New Caledonia, were described or redescribed, and some new data on their biology were obtained.

Selected publications

- **Moravec F.** 2009: Experimental studies on the development of *Contracaecum rudolphii* (Nematoda: Anisakidae) in copepod and fish paratenic hosts. *Folia Parasitologica* 56: 185–193. [IF = 1.266]
- **Moravec F.**, Charo-Karisa H., Jirků M. 2009: Philometrids (Nematoda: Philometridae) from fishes of Lake Turkana, Kenya, including two new species of *Philometra* and erection of *Afrophilometra* gen. n. *Folia Parasitologica* 56: 41–54. [IF = 1.266]
- **Moravec F.**, Justine J.-L. 2009: New data on dracunculoid nematodes from fishes off New Caledonia, including four new species of *Philometra* (Philometridae) and *Ichthyofilaria* (Guyanemidae). *Folia Parasitologica* 56: 129–142. [IF = 1.266]
- **Moravec F.**, Montoya-Mendoza J., Salgado-Maldonado G. 2008: A new genus and species of philometrid (Nematoda) from the subcutaneous tissue of the crevalle jack, *Caranx hippos* (Osteichthyes), from the southern Gulf of Mexico. *Journal of Parasitology* 94: 1346–1350. [IF = 1.165]
- **Moravec F.**, Santos M.D., Brasil-Sato M.C. 2008: Redescription of *Cystidicoloides fischeri* based on specimens from piranhas in Brazil, and erection of a new genus (Nematoda: Cystidicolidae). *Journal of Parasitology* 94: 889–897. [IF = 1.165]

Research project

- **Comparative studies on nematodes of the order Spirurida parasitizing fishes.** Grant Agency of the Czech Republic (524/06/0170; P.I.: F. Moravec; 2006–2008)

Department of Molecular Ecology of Parasites

Head: **Libor GRUBHOFFER**

Laboratory of Molecular Biology of Vectors and Pathogens

Joint Research Unit with Faculty of Science, University of South Bohemia, České Budějovice

Research scientists:	Prof. RNDr. **Libor GRUBHOFFER**, CSc. (*head*) RNDr. **Ondřej Hajdušek**, Ph.D., **Nataliia Rudenko**, Ph.D. (Ukraine), RNDr. **Daniel Růžek**, Ph.D.
Ph.D. students:	Mgr. **Jiří Černý**, Mgr. **Tereza Chrudimská**, Mgr. **Jana Horáčková**, Mgr. **Václav Hönig**, Mgr. **Hana Šťastná**, Mgr. **Ján Štěrba**
Research assistants:	**Maryna Golovchenko**, MSc. (Ukraine), Ing. **Gabriela Loosová**
Undergraduate students:	Bc. **Lenka Bučinská**, Bc. **Veronika Dorňáková**, Bc. **Jarmila Dupejová**, Bc. **Miroslav Fišer**, Bc. **Jiří Havran**, Bc. **Patrik Kilian**, Bc. **Kristýna Kvardová**, Bc. **Martin Palus**, Bc. **Renata Strouhalová**, Bc. **Zuzana Šimonová**, Bc. **Vendula Vetišková**, **Lucie Jedličková**, **Martina Jonáková**, **Kateřina Leštinová**, **David Pech**, **Martin Strnad**, **Karolína Šustrová**, **Zuzana Tesařová**, **Lenka Vašková**, **Zuzana Vavroušková**, **Adriana Walnerová**
Laboratory worker:	**Zuzana Němcová**

Research priorities

Our group studies molecular and cellular factors involved in the mechanism of pathogen transmission by ticks. Lyme borreliosis (LB) spirochetes, as well as the tick-borne encephalitis virus, are the main focus of research, with respect to protein-carbohydrate interactions, and their interaction with the inner environment of the tick *Ixodes ricinus*.

New species of *Borrelia* spirochetes

We described two new species from the *B. burgdorferi* sensu lato complex, isolated in the Southeastern region of the United States of America from competent tick vector and rodent hosts, which we named *B. carolinensis* sp. nov. and *B. americana* sp. nov. Our results showed the necessity of re-evaluation of the formerly accepted dogma about the small variability of LB spirochetes in North America in general, and their total absence in southeastern part of the USA in particular.

Mechanism of tick-borne encephalitis pathogenesis

Research was focused on the pathogenesis of tick-borne encephalitis (TBE), with special focus on virus-mediated damage of neural cells, their apoptosis, changes in gene expression and immunopathological features of the host immune system. The key mediator of the immunopathological reaction is the population of $CD8^+$ T-cells migrating into the CNS, as shown in experiments with SCID or $CD8^{-/-}$ mice, and with adoptively transferred $CD8^+$ or $CD4^+$ T-cells.

Borrelia bissettii in patients with Lyme borreliosis

Molecular analysis of clinical samples collected from Czech patients with symptomatic borreliosis or chronic borrelial infection showed the presence of *B. bissettii* DNA. Our results strongly support the notion that *B. bissettii* is a causative agent of human LB in Europe.

Ixodes ricinus antimicrobial proteins

Two isoforms of the defensin gene (Def 1, 2) and two genes encoding His-rich proteins (Ricinusin and Hebraein-like proteins) were identified in the European tick *I. ricinus*. These genes are upregulated with different tissue expression patterns mainly in blood-fed ticks or after bacterial innoculation. Antimicrobial studies showed that low doses of synthetic def1 and def2 inhibited the growth of a large spectra of Gram-positive bacteria, including the multi-resistant *Staphylococcus aureus*.

Fibrinogen-related proteins and N-glycosylation of tick proteins

Several fibrinogen-related proteins/lectins containing the fibrinogen-related domain (FreD) were identified and modified by truncated high-mannose glycans. The nucleotide sequence of FreD was identified in *D. marginatus*, *Haemaphysalis punctata* and *Hyalomma impeltatus*. FReD proteins in *D. marginatus* were localised to hemocytes, salivary glands and gut cells.

Selected publications

- **Grubhoffer L.**, Rego R.O.M., **Hajdušek O.**, Hypša V., Kovář V., **Rudenko N.**, Oliver J.H. Jr. 2008: Tick lectins and fibrinogen-related proteins. In: A.S. Bowman and P.A. Nuttall (Eds.), Ticks: Biology, Disease and Control. Cambridge University Press, Cambridge, UK, pp. 127–142.
- **Hajdušek O.**, Sojka D., Kopáček P., Burešová V., Franta Z., Šauman I., Winzerling J., **Grubhoffer L.** 2009: Knockdown of proteins involved in iron metabolism limits tick reproduction and development. *Proceedings of the National Academy of Science of the United States of America* 106: 1033–1038. [IF = 9.432]
- **Rudenko N.**, **Golovchenko M.**, **Grubhoffer L.**, Oliver J.H. Jr. 2009: *Borrelia carolinensis* sp. nov. – a new (14th) member of *Borrelia burgdorferi* sensu lato complex from the southeastern United States. *Journal of Clinical Microbiology* 47: 134–141. [IF = 4.162]
- **Růžek D.**, Gritsun T.S., Forrester N.L., Gould E.A., Kopecký J., **Golovchenko M.**, **Rudenko N.**, **Grubhoffer L.** 2008: Mutations in the NS2B and NS3 genes affect mouse neuroinvasiveness of a Western European field strain of tick-borne encephalitis virus. *Virology* 374: 249–255. [IF = 3.539]
- **Štěrba J.**, Vancová M., **Rudenko N.**, **Golovchenko M.**, Tremblay T.-L., Kelly J.F., MacKenzie R.C., Logan S.M., **Grubhoffer L.** 2008: Flagellin and outer surface proteins from *Borrelia burgdorferi* are not glycosylated. *Journal of Bacteriology* 190: 2619–2623. [IF = 3.636]

Research projects

- **Integrated Consortium on Ticks and Tick-borne Diseases (ICTTD-3).** Sixth Programme FW EU, INCO, Coordination Action Project No. 510561 (P.I.: F. Jongejan, University of Utrecht; 2005–2010)
- **Ticks and infectious diseases transmitted by ticks under conditions of South Bohemia and Lower Bavaria.** EU-operational programme “Cross-border co-operation between the Czech Republic and Free State of Bavaria” (No. 107; P.I.: L. Grubhoffer and K. Pfister; 2009–2011)
- **Molecular pathogenesis of tick-borne encephalitis.** Grant Agency of the Czech Republic (524/08/1509; P.I.: L. Grubhoffer; 2008–2010)
- **Interaction of Lyme borreliosis spirochetes and salivary glands of *Ixodes ricinus* tick: the role of borrelia OspC protein.** Grant Agency of the Czech Republic (206/09/1782; P.I.: L. Grubhoffer; 2009–2011)
- **Rapid diagnostics of viral hemorrhagic fevers.** Internal Grant Agency of the Ministry of Defence of the Czech Republic (OVUVZU2008002; P.I.: D. Růžek; 2008–2011)

Laboratory of Vector Immunology

Research scientist:	RNDr. **Petr KOPÁČEK**, CSc. (head) RNDr. **Daniel Sojka**, Ph.D., RNDr. **Lenka Grunclová**, Ph.D., RNDr. **Veronika Burešová**, Ph.D.
Ph.D. students:	RNDr. **Zdeněk Franta**, Mgr. **Helena Pěničková**
Undergraduate students:	Bc. **Tereza Cermanová**, Bc. **František Musil**, **Petr Franta**, **Jana Kadlecová**, **Jan Perner**

Research priorities

Characterization and function of molecules involved in the innate immunity, blood digestion and iron metabolism of the hard tick *Ixodes ricinus*.

The complement-like molecules in *Ixodes ricinus* and their role in the innate immunity and pathogen transmission

The thioester-containing proteins are evolutionarily conserved constituents of innate immunity comprising three phylogenetically distinct groups: (i) α_2-macroglobulins (α_2M) – the universal macromolecular protease inhibitors; (ii) the components C3/C4/C5 of the complement; (iii) insect thioester proteins (TEPs). The pilot data mining in the genome of the American deer tick *Ixodes scapularis* revealed that ticks apparently possess molecules related to all three groups. Given the high gene/protein similarity we were able to perform a reliable functional genomic study also with the European species *I. ricinus*, the vector of Lyme disease and tick-borne encephalitis. We have characterized the IrAM1 – an α_2M from the plasma of *I. ricinus* and found that silencing this molecule by dsRNA interference markedly reduced the phagocytosis of a potential pathogen *Chryseobacterium indologenes* by tick hemocytes. We also tested the phagocytic activity of tick hemocytes in response to RNAi silencing of other tick thioester proteins and fibrinogen-related proteins (ixoderins).

Mapping of hemoglobinolytic peptidases in the gut of the tick *I. ricinus*

Two-pronged strategy including reverse genetic approach and selective inhibitor-based proteomic analysis of the gut extract allowed us to decipher the peptidase network involved in the blood digestion in the *I. ricinus* gut. The intracellular degradation of hemoglobin, the major protein constituent of the blood-meal, is initiated by the acidic endopeptidases of aspartic and cysteine class (cathepsins D and L supported by asparaginyl endopeptidase) at optimum pH about 4. The large hemoglobin fragments are further cleaved mainly by the endopeptidolytic activity of cathepsin B at pH about 5 and continued by cysteine amino- and carboxy-dipeptidases (cathepsins C and B). The dynamic profiling during blood feeding revealed that gene expression as well as enzyme activities of all digestive peptidases markedly increase towards the end of the slow-feeding period just before ticks start the rapid engorgment ('big sip'). Cystein/aspartic peptidase system for blood digestion seems to be evolutionarily conserved but differs substantially from blood-sucking insects relying mainly on serine peptidases.

Iron metabolism in the tick *Ixodes ricinus*

Research on how the hard tick *I. ricinus* manages the surplus of iron originating from the host blood led to the discovery of yet unknown protein designated as ferritin 2. In contrast to the previously described ferritin 1 functioning as intracellular iron-storage molecule, the novel ferritin 2 is secreted into the hemolymph of the tick. The roles of ferritin 1, ferritin 2 and 'iron-regulatory protein' (IRP) in tick iron metabolism was studied using RNA interference, specifically blocking their synthesis. It was demonstrated that ferritin 2 functions in iron transport from the tick gut to the peripheral organs. Elimination of ferritin 2 by RNAi severely affected tick ability to feed on the host. A similar effect was achieved by experimental vaccination of rabbits with recombinant ferritin 2, where the antibodies imbibed with the host blood efficiently blocked ferritin 2 in the tick gut. This fact, together with a remarkable molecular difference from ferritins of mammalian hosts, makes the tick ferritin 2 a promising candidate for an efficient 'anti-tick' vaccine protecting from tick feeding and limiting their ability to transmit pathogens causing infection diseases.

Selected publications

- **Burešová V.**, Hajdušek O., **Franta Z.**, **Sojka D.**, **Kopáček P.** 2009: IrAM-An α2-macroglobulin from the hard tick *Ixodes ricinus*: characterization and function in phagocytosis of a potential pathogen *Chryseobacterium indologenes*. *Developmental and Comparative Immunology* 33: 489–498. [IF = 3.290]
- Hajdušek O., **Sojka D.**, **Kopáček P.**, **Burešová V.**, **Franta Z.**, Šauman I., Winzerling J., Grubhoffer L. 2009: Knockdown of proteins involved in iron metabolism limits tick reproduction and development. *Proceedings of the National Academy of Science of the United States of America* 106: 1033–1038. [IF = 9.432]
- Horn M., Nussbaumerová M., Šanda M., Kovářová Z., Srba J., **Franta Z.**, **Sojka D.**, Bogyo M., Caffrey C.R., **Kopáček P.**, Mareš M. 2009: Hemoglobin digestion in blood-feeding ticks: mapping a multipeptidase pathway by functional proteomics. *Chemistry & Biology* 16: 1053–1063. [IF = 6.523]
- Ovat A., Muindi F., Fagan C., Brouner M., Hansell E., Dvořák J., **Sojka D.**, **Kopáček P.**, McKerrow J.H., Caffrey C.R., Powers J.C. 2009: Aza-peptidyl Michael acceptor and epoxide inhibitors-potent and selective inhibitors of *Schistosoma mansoni* and *Ixodes ricinus* legumains (asparaginyl endopeptidases). *Journal of Medicinal Chemistry* 52: 7192–7210. [IF = 4.802]
- **Sojka D.**, **Franta Z.**, Horn M., Hajdušek O., Caffrey C.R., Mareš M., **Kopáček P.** 2008: Profiling of proteolytic enzymes in the gut of the tick *Ixodes ricinus* reveals an evolutionarily conserved network of aspartic and cysteine peptidases. *Parasites & Vectors* 2008 1: 7.

Research projects

- **The role of tick alpha-2-macroglobulin in pathogen trasmisson by the hard tick *Ixodes ricinus*.** Grant Agency of the Academy of Sciences of the Czech Republic (IAA 600220603; P.I.: P. Kopáček; 2006–2008)
- **Peptidases in the gut of the hard tick *Ixodes ricinus:* characterization and potential for vector-control.** Grant Agency of the Czech Republic (206/06/0865; P.I.: P. Kopáček; 2006–2008)
- **The digestive system of ticks – the target for rational development of vaccine against ticks and tick-borne pathogens.** Grant Agency of the Academy of Sciences of the Czech Republic (IAA 600960910; P.I.: P. Kopáček; 2009–2012)

Laboratory of Molecular Phylogeny and Evolution of Parasites

Research scientists:	Prof. RNDr. **Václav HYPŠA**, CSc. (head) RNDr. **Andrea Škeříková**, Ph.D. RNDr. **Jan Štefka**, Ph.D.
Ph.D. students:	Mgr. **Tomáš Chrudimský**, MVDr. **Jana Kvičerová**, RNDr. **Eva Nováková**, RNDr. **Jana Martinů**
Technician:	**Lenka Štifterová**
Undergraduate students:	Bc. **Tereza Marvanová**, **Filip Husník**, **Petra Jašková**, **Anna Mácová**, **Tomáš Svozil**

Research priorities

Our research is mainly focused on molecular phylogenetic analysis of the origin, evolution and relationships of parasitic and symbiotic organisms. It further involves investigation into their co-evolution, biogeography and other bionomical features, including intraspecific variability and genealogy. The research is carried out on several models of parasitic and symbiotic associations.

Evolution of the symbiotic bacteria of the genus *Arsenophonus*

The genus *Arsenophonus* is a group of symbiotic, mainly insect-associated bacteria known from a broad range of hosts. We extended the known spectrum of the *Arsenophonus* forms with new lineages isolated mainly from the bloodsucking insects from the families Hippoboscidae and Nycteribiidae. We investigated the phylogenetic relationships within the genus by analysis of 110 *Arsenophonus* sequences (including those of *Riesia* and *Phlomobacter*). We showed that complete understanding of *Arsenophonus* evolution cannot be achieved with 16S rDNA, and demonstrated the sensitivity of the phylogenetic signal to taxa sampling. In relation to the host, we detected two contrasting co-evolutionary patterns occurring throughout the tree: parallel host-symbiont evolution and the haphazard association of the symbionts with distant hosts. A further conspicuous feature of this topology is the occurrence of monophyletic symbiont lineages associated with monophyletic groups of hosts without a co-speciation pattern. We suggest that part of this incongruence could be caused by methodological artifacts, such as intragenomic variability.

Host specificity and genealogy of the tapeworm *Ligula intestinalis*

Using 15 microsatellite loci and sequences of mitochondrial genes, we analyzed the genealogy and population structure of *Ligula intestinalis*, a fish tapeworm with a complex life cycle, wide host spectrum and global distribution. We determined the deep genetic structure between populations from distant geographical areas. On the local scale, we found host-mediated genetic structure among sympatric samples. In the Euro-Mediterranean area, we recognized two sympatric genetic lineages differing in the spectrum of infected hosts. Similarly, two distinct host-specific lineages were recovered from Lake Tana in Ethiopia. In contrast, a lack of marked genetic structure was seen in the populations belonging to one of the European lineages. The complexity of the parasite life cycle seems to contribute to such a stratified pattern.

Sucking louse *Polyplax serrata* and mice of the genus *Apodemus*

The preceding studies on *P. serrata* genealogy have been extended with the analysis of new material. A more detailed sampling of local populations confirmed the co-occurrence of two sympatric lineages with different host specificity. To analyze more recent events within the louse populations, we developed a set of microsatellites and have started their analyses in sympatric populations.

Phylogeny of rodent-associated *Eimeria*

In the frame of a study focused on the origin and evolution of rodent-associated eimerians, we isolated samples of morphologically determined *Eimeria* species from 30 different hosts, mainly various rodent species. To perform a complex phylogenetic analysis, we obtained sequences from two DNA regions, namely 18S rDNA and the ORF 470 gene. At the population level, we started genealogical investigation of eimerians isolated from three species of *Apodemus* mice (*A. sylvaticus*, *A. flavicollis*, *A. agrarius*). To establish the relationships between genetic structure and host specificity, we sequenced mitochodrial gene for cytochrome c oxidase subunit I.

Selected publications

- **Hypša V.**, **Nováková E.** 2008: Insect symbionts and molecular phylogenetics. In: K. Bourtzis and T.A. Miller (Eds.), Insect Symbiosis. Vol. 3. CRC Press, Boca Raton, Florida, USA, pp. 1–32.
- **Kvičerová J.**, Pakandl M., **Hypša V.** 2008: Phylogenetic relationships among *Eimeria* spp. (Apicomplexa, Eimeriidae) infecting rabbits: evolutionary significance of biological and morphological features. *Parasitology* 135: 443–452. [IF = 2.071]
- **Šorfová P.**, **Škeříková A.**, **Hypša V.** 2008: An effect of 16S rRNA intercistronic variability on coevolutionary analysis in symbiotic bacteria: molecular phylogeny of *Arsenophonus triatominarum*. *Systematic and Applied Microbiology* 31: 88–100. [IF = 2.582]
- **Štefka J.**, **Hypša V.** 2008: Host specificity and genealogy of *Polyplax serrata* on *Apodemus* species: a case of parasite duplication or colonisation? *International Journal for Parasitology* 38: 731–741. [IF = 3.752]
- **Štefka J.**, **Hypša V.**, Scholz T. 2009: Interplay of host specificity and biogeography in the population structure of a cosmopolitan endoparasite: microsatellite study of *Ligula intestinalis* (Cestoda). *Molecular Ecology* 18: 1187–1206. [IF = 5.960]

Research projects

- **Genealogy and population structure of parasites in relation to host specificity and biogeography.** Grant Agency of the Czech Republic (206/08/1019; P.I.: V. Hypša; 2008–2011).
- **An effect of rDNA intragenomic variability on coevolutionary analysis in insect-symbiont.** Grant Agency of the Academy of Sciences of the Czech Republic (IAA601410708; P.I.: V. Hypša; 2007–2009)

Department of Parasite Immunology

Head: **Jan KOPECKÝ**

Laboratory of Vector-Host Interactions

Research scientists:	Doc. RNDr. **Jan KOPECKÝ**, CSc. (*head*) RNDr. **Jiří Salát**, Ph.D. **Jaroslava Lieskovská**, Ph.D. (since September 2009) **Michail Kotsyfakis**, Ph.D. (since October 2009)
Ph.D. students:	RNDr. **Jindřich Chmelař**, RNDr. **Kateřina Černá**, RNDr. **Helena Horká**, Mgr. **Peter Koník**, RNDr. **Anna Skallová**
Research assistant:	Bc. **Veronika Slavíková**
Technicians:	**Jan Erhart**, **Eva Řezníčková** (part time), **Eva Výletová**
Laboratory worker:	**Lenka Marešová**
Undergraduate students:	Bc. **Eva Gregorová**, Bc. **Nina Růžičková**, Bc. **Martina Slámová**, Bc. **Eva Slepičková**, Bc. **Karolína Šubrtová**, **Lucie Brejchová**, **Markéta Hejníková**, **Zdeňka Jankovská**, **Michaela Kotková**, **Jana Páleníková**

Research priorities

Immunomodulatory effects of *Ixodes ricinus* tick saliva on the host and their role in tick-borne pathogen transmission.

Immunomodulatory molecules from tick saliva

***Ixodes ricinus* serpin IRS-2**

IRS-2 was prepared from a cDNA library constructed from salivary glands of partially fed *I. ricinus* females. It was demonstrated that IRS-2 inhibits alpha-chymotrypsin, thrombin, trypsin, cathepsin G and chymase. The last two enzymes are important for the development of an inflammatory reaction, platelets activation and hemocoagulation. IRS-2 prevented activation of platelets by cathepsin G and reduced foodpad swelling induced by carrageenan. This effect was caused by a markedly reduced influx of neutrophils into the inflammation site. IRS-2 creates a covalent complex with the mouse homologue of chymase produced by mast cells. In addition to salivary glands, IRS-2 is also expressed in ovaries and the midgut, but is not upregulated in these tissues during blood feeding as it is in salivary glands.

Saliva-activated transmission activity of tick cystatins

Sialostatin L2 from *I. scapularis* accelerated proliferation of *Borrelia burgdorferi* spirochetes when co-injected with the pathogen. A four-fold increase of spirochete count was recorded at the inoculation site. Sialostatin L2 seems to be the second known Saliva-activated transmission factor identified so far.

Tick cystatins and their effect on mast cells

Mast cells represent an important component of hypersensitivity and immunoregulation mechanisms. *Ixodes ricinus* saliva markedly inhibited production of IL-9 by ionomycin-stimulated mast cells. Production of IL-4 and IL-13 was also reduced. A similar effect on mast cells was demonstrated for two recombinant cystatins derived from the American tick, *I. scapularis*. One of these cystatins, sialostatin L, markedly reduced production of IL-9 by a special Th9 subset of Th lymphocytes. Intravenous application of sialostatin L caused significant reduction of airway hyperresponsiveness after administration of an allergen, serving as a model for allergic asthma.

Salivary cystatin from the soft tick *Ornithodoros moubata* (OmC2)

Recombinant OmC2 was screened against a panel of physiologically relevant peptidases and found to be an effective broad-specificity inhibitor of cysteine cathepsins, including endopeptidases (cathepsins L and S) and exopeptidases (cathepsins B, C and H). The crystal structure of OmC2 was determined and used to describe the relationship of its structure to its inhibitory activity. OmC2 affected the function of antigen-presenting mouse dendritic cells by reducing the production of the proinflammatory cytokines TNF-alpha and IL-12, and the proliferation of antigen-specific CD4+ T cells. Immunization of mice with OmC2 significantly suppressed the survival of *O. moubata* ticks in experiments.

Selected publications

- **Chmelař J.**, **Kopecký J.**, Anderson J.M., Valenzuela J.G., Jochim R.C., Mu J. 2008: Insight into the sialome of the castor bean tick, *Ixodes ricinus*. *BMC Genomics* 9: 233, 21 pp. [IF = 3.926]
- **Horká H.**, **Černá-Kýčková K.**, **Skallová A.**, **Kopecký J.** 2009: Tick saliva affects both proliferation and distribution of *Borrelia burgdorferi* spirochetes in mouse organs and increases transmission of spirochetes to ticks. *International Journal of Medical Microbiology* 299: 373–380. [IF = 2.802]
- Růžek D., **Salát J.**, Palus M., Gritsun, T. S., Gould E. A., Dyková I., **Skallová A.**, Jelínek J., **Kopecký J.**, Grubhoffer L. 2009: CD8+ T-cells mediate immunopathology in tick-borne encephalitis. *Virology* 384: 1–6. [IF = 3.042]
- **Salát J.**, **Jelínek J.**, **Chmelař J.**, **Kopecký J.** 2008: Efficacy of gamma interferon and specific antibody for treatment of microsporidiosis caused by *Encephalitozoon cuniculi* in SCID mice. *Antimicrobial Agents and Chemotherapy* 52: 2169–2174. [IF = 4.716]
- **Skallová A.**, Iezzi G., Ampenberger F., Kopf M., **Kopecký J.** 2008: Tick saliva inhibits dendritic cell migration, maturation and function, while promoting development of Th2 responses. *Journal of Immunology* 180: 6186–6192. [IF = 6.000]

Research projects

- **Immunomodulatory properties of tick cystatins.** Grant Agency of the Academy of Sciences of the Czech Republic (KJB 500960702; P.I.: J. Salát; 2007–2009)
- **Research Centre for Molecular Ecology of Vectors and Pathogens.** Ministry of Education, Youth and Sports (LC06009; P.I.: J. Kopecký; 2006–2010)
- **Identification of tick salivary molecules facilitating transmission of *Borrelia burgdorferi* using RNA interference.** Grant Agency of the Academy of Sciences of the Czech Republic (IAA600960811; P.I.: J. Kopecký; 2008–2010)

Supporting facility

Laboratory of Electron Microscopy

Research scientists:	Ing. **Jana NEBESÁŘOVÁ**, CSc. (*head*) RNDr. **Stanislav Hucek**, Ph.D. (part time) RNDr. **Marie Vancová**, Ph.D. (part time)
Technicians:	Mgr. **Věra Kučerová**, Mgr. **Jan Langhans**, Bc. **Tomáš Bílý**, Bc. **Martina Tesařová**, **Petra Masařová**, **Jiří Vaněček**
Undergraduate students:	Bc. **Lenka Bučinská**, Bc. **Jason Dean**, Bc. **Silvie Svidenská**, **Markéta Svatáková**

The laboratory of Electron Microscopy is a supporting facility of the research groups at the Institute of Parasitology and other institutions of the Biology Centre in České Budějovice.

Technical equipment

- **Transmission electron microscopes**
  - JEOL 1010 (purchased in 1996) equipped with a MegaView 3 SSC camera and analySIS 3.1 image acquisition software
  - Philips 420 (1985) with cryo-holder and BIO scan CCD camera with Digital Micrograph of GATAN acquisition software
  - Low voltage electron microscope LV EM 5 (2002), Delong Instruments
- **Scanning electron microscopes**
  - JEOL 7401F (2005) with cryo-attachment ALTO 2500 GATAN
  - JEOL 6300 (1993)
- **Leica Ultramicrotomes** with and without cryo-chamber
- **Leica EM Pact2 High Pressure Freezer** – a system for vitrifying samples up to 200 µm in thickness without the artefacts of chemical fixation
- **Leica EM AFS Automatic freeze substitution system** for substitution and low temperature embedding after cryofixation and for the PLT technique

Methods of sample preparation

The laboratory offers a broad spectrum of methods standardly used for the biological specimen preparation. For ultrastructure studies, chemical methods of specimen treatment are usually used in combination with microwave irradiation. The cryofixation with the high pressure freezer followed by freeze substitution is used for the best preservation of specimen ultrastructure. For immunolocalisation of target molecules by means of colloidal gold as a label, mainly post-embedding methods are used for ultrathin sections embedded in LR White and Lowicryl resins or for thawed cryo-sections.

Selected publications:

- Honys D., Reňák D., Feciková J., Jedelský P.L., **Nebesářová J.**, Dobrev P., Čapková V. 2009: Cytoskeleton-associated large RNP complexes in tobacco male gametophyte (EPPs) are associated with ribosomes and are involved in protein synthesis, processing, and localization. *Journal of Proteome Research* 8: 2015–2031. [IF = 5.132]
- Moore R.B., Oborník M., Janouškovec J., Chrudimský T., **Vancová M.**, Green D.H., Wright S.W., Davies N.W., Bolch C.J.S., Heimann K., Šlapeta J., Hoegh-Guldberg O., Logsdon J.M., Carter D.A. 2008: A photosynthetic alveolate closely related to apicomplexan parasites. *Nature* 451: 959–963. [IF = 31.434]
- Růžek D., **Vancová M.**, **Tesařová M.**, Ahantaring A., Kopecký J., Grubhoffer L. 2009: Morphological changes in human neural cells following tick-borne encephalitis virus infection. *Journal of General Virology* 90: 1649–1658. [IF = 3.260]
- Zacharovová K., Berková Z., Herynek V., Girman P., Koblas F., Pektorová L., Dovolilová E., **Vancová M.**, **Nebesářová J.**, Saudek F. 2008: Magnetic iron nanoparticles in rat pancreatic islets: post-transplantation tracking. *Diabetologia* 51: S245. [IF = 6.418]

Research projects

- **Workplace for applications of low voltage electron microscopy on biological specimens.** Programme of the Support of Targeted Research Projects of the Academy of Sciences of the Czech Republic (1SQ600220501; P.I.: J. Nebesářová; 2005–2009).
  The aim of the project was to find suitable procedures of biological specimen preparation and suitable application in biology and medicine for a new type of electron microscope working with accelerating voltage only 5 kV.
- **New nanoparticles for ultrastructural diagnostics.** Programme "Nanotechnologies for Society" Academy of Sciences of the Czech Republic (KAN200520704, Co-I.: J. Nebesářová; 2007–2011).
  The project aims to develop a set of nanoparticles sized 5–15 nm with various shapes or elemental composition suitable for ultrastructural cytochemistry. The result will be a set of at least four distinguishable electron-stable nanoparticles for multiple ultrastructural labelings in biomedicine and biology.
- **Glycoprotein analysis of *Ixodes ricinus* salivary glands.** Grant Agency of the Academy of Sciences of the Czech Republic (KJB600960906, P.I.: M. Vancová, 2009–2011).
  Saliva and salivary glands of these medically important parasites were isolated for direct MALDI TOF/TOF glycan analyses, purification and characterization of glycoconjugates using lectins. Our research is focused on core fucosylated, sialylated and mannosylated glycans.

Collaboration within projects not related directly to the Institute's research plan

- **Scientific collaboration in the identification of impurities in components through the scanning electron microscope.** Robert Bosch Company, České Budějovice

Special activities

Collections of parasitic organisms

An extensive collection of cryopreserved cultures of blood flagellates and amphizoic amoebae is maintained at the Department of Eukaryotic Microorganisms Infecting Fish.

An extensive collection of helminths, curated by František Moravec, is available for comparative studies to helminthologists from various countries. It comprises about 3,000 species from around the world, including numerous type specimens.

A collection of holotypes and paratypes of about 300 species of parasitic arthropods, on 430 microscopic slides, is deposited at the Institute, as well as a large collection of several thousand specimens of parasitic mites and fleas from mammals, birds and reptiles, and a small collection of ticks in alcohol. The Institute maintains laboratory colonies of ticks (8 species), mosquitoes (4 species, 5 lines) and arboviruses (33 species and strains).

More information can be found at http://www.paru.cas.cz/index_left.php?static=69

Publishing and editorial activities

FOLIA PARASITOLOGICA – an international journal

Editor-in-Chief: Vladimír Bukva

Assistant Editors: Libor Grubhoffer (arthropod vectors and transmitted agents of disease)
Jiří Lom (parasitic protozoa)
František Moravec (helminths)

Editorial Assistant: Jana Gelnarová (till June 2008),
Dana Hanzliková Vašková (since October 2008)

Folia Parasitologica is an international journal for parasitology, publishing articles written in English. It was founded in 1953 as an annual edition. Since 1966, it has been published four times a year. The Editor-in-Chief and three Assistant Editors from the Institute of Parasitology are aided by an international Board of Editorial Advisors, consisting of 38 highly regarded scientists, 30 of them being foreign parasitologists. Each manuscript is rigorously reviewed by at least two referees who are known for excellence in their field of expertise. As a result of this demanding review process, the rejection rate was 65% in 2008–2009. Folia has a wide international authorship: in 2008–2009, around 60% of senior authors of published papers were from abroad. The Impact Factor of Folia was 1.000 for 2007 and 1.307 for 2008, reflecting the journal's good position among international parasitology periodicals.

Folia is desk-top edited, figure reproduction being the only operation entrusted to a commercial printer. Final printing is on high-quality glossy paper of A4 size, allowing for the excellent reproduction of line drawings and B&W/colour photographs. Folia is widely indexed/abstracted in key biological databases such as BIOSIS (Biological Abstracts, Biological Abstracts/RRM, Abstracts of Entomology, Zoological Record), CAB (Helminthological and Protozoological Abstracts, Review of Medical and Veterinary Entomology, Tropical Diseases Bulletin), ISI (Current Contents/Agriculture, Biology & Environmental Sciences, Science Citation Index Expanded, Web of Knowledge) and NLM (MEDLINE). Full text of articles can be downloaded from the Folia website, ProQuest Biology/Medicine Journals or CABI Full Text databases.

EMBO Practical Course on Electron Microscopy and Stereology in Cell Biology České Budějovice, Czech Republic, 20–29 August 2008

The Laboratory of Electron Microscopy, headed by *J. Nebesářová*, organized a practical EMBO course on Electron Microscopy and Stereology in Cell Biology for the third time. This prestigious international course, funded by the European Molecular Biology Organisation (EMBO), is focused on teaching of cutting-edge EM techniques to cell biologists.

A total of 22 graduate students and young scientists mainly from Europe, and 20 expert teachers, made up an enthusiastic team during their stay in České Budějovice. Lectures and practicals covered many topics, including basic knowledge for beginners in this field, and also the latest methods in specimen preparation for immunolabeling. The theoretical part of the course comprised a third of its duration. The rest of the time was dedicated to the practical training, with the aim of teaching students the techniques of sectioning and cryosectioning, rapid freezing methods as an alternative to chemical fixation, freeze substitution and resin embedding.

Mitochondrion of *Trypanosoma brucei* enters the post-proteomic era Třešť, Czech Republic, 27–30 September 2009

More than 70 participants have met in a beautiful chateau in Třešť at a conference organised by the Laboratory of Molecular Biology of Protists (*Julius Lukeš*). Outstanding experts from all over the world dealt with the mitochondrion of *Trypanosoma brucei*, as well as other organisms, in 28 lectures and a poster session.

The ICTTD Bioinformatics Workshop: CAS (cDNA annotation system) – a bioinformatics tool suitable for mining tick, tick-borne pathogen and mammalian ESTs. České Budějovice, Czech Republic, 9–15 June 2008

The workshop was organized by the Department of Molecular Ecology of Parasites (Libor Grubhoffer) to train scientists working with tissues and tick-borne pathogens within the International Consorcium on Ticks and Tick-borne Diseases (ICTTD) consortium to manage and exploit large EST datasets, as well visualize, navigate and compare whole genome sequences. Altogether 26 postdoctoral fellows and graduate students from 16 countries around the world attended the workshop. Ten lecturers from the USA, UK, Austria, Brazil, Germany and Spain conducted theoretical and practical lessons. Participants were trained in the use of NCBI, CAS and Artemis tools during the six day workshop. (Supported by the Integrated Consortium on Ticks and Tick-borne Diseases (ICTTD-3), 6th Framework Programme FW EU, INCO-Programme, Coordination Action Project No. 510561).

List of the Institute's employees by professional classification (2008–2009)

Telephone: +420 38 777 **5403***   Fax: +420 38 531 0388

Research scientists

SURNAME	NAME	TITLE	E-MAIL	*EXTENSION
Asahina-Jindrová	Masako	MSc., Ph.D.	masako@paru.cas.cz	5472, 5481
Baruš	Vlastimil	Prof. Ing., DrSc.	(till December 2008)	
Bruňanská	Magdaléna	RNDr., CSc.	(till September 2008)	
Bukva	Vladimír	prom. biol., CSc.	bukva@paru.cas.cz	5450
Burešová	Veronika	Mgr., Ph.D.	veronika@paru.cas.cz (maternity leave)	5490
Ditrich	Oleg	Doc. RNDr., CSc.	oleg@paru.cas.cz	5420
Dvořák	Jan	RNDr., Ph.D.	hdvorak76@centrum.cz	5476, 5429
Dyková	Iva	Prof. MVDr., DrSc.	iva@paru.cas.cz	5423, 5414
Faktorová	Drahomíra	RNDr., Ph.D.	dranov@paru.cas.cz (maternity leave)	5439
Faltýnková	Anna	RNDr., Ph.D.	faltyn@paru.cas.cz (maternity leave)	5486
Fiala	Ivan	RNDr., Ph.D.	fiala@paru.cas.cz	5425
Grubhoffer	Libor	Prof. RNDr., CSc.	liborex@paru.cas.cz	5456, 2244
Hajdušek	Ondřej	RNDr., Ph.D.	hajdus@paru.cas.cz	5465
Hajdušková	Martina	Mgr., Ph.D.	anitram@paru.cas.cz	5472, 5481
Hashimi	Hassan	RNDr., Ph.D.	hassan@paru.cas.cz	5416
Horák	Aleš	Mgr., Ph.D.	ogar@paru.cas.cz	5428
Horáková	Eva	RNDr., Ph.D.	(maternity leave)	5416
Hucek	Stanislav	RNDr., Ph.D.	(till December 2009)	
Hypša	Václav	Prof. RNDr., CSc.	vacatko@paru.cas.cz	5441
Jirků	Milan	RNDr.	jirku@paru.cas.cz	5416
Jirků	Miloslav	Mgr., Ph.D.	miloslav.jirku@seznam.cz	5474
Kopáček	Petr	RNDr., CSc.	kopajz@paru.cas.cz	2207
Kopecký	Jan	Doc. RNDr., CSc.	jan@paru.cas.cz	5468, 5462
Kostadinova	Aneta	Ph.D.	aneta.kostadinova@uv.es	5486
Kostka	Martin	Mgr., Ph.D.	mkostka@centrum.cz	5414
Kotsyfakis	Michail	Ph.D.	mich_kotsyfakis@yahoo.com	5463
Koudela	Břetislav	Prof. MVDr., CSc.	koudelab@vfu.cz	5408
Kuchta	Roman	RNDr., Ph.D.	krtek@paru.cas.cz	5488
Kváč	Martin	Doc. Ing., Ph.D.	kvac@paru.cas.cz	5419
Levron	Céline	Ph.D.	levron@paru.cas.cz	5410
Lieskovská	Jaroslava	Mgr., Ph.D.	lieskovs@paru.cas.cz	5463
Lom	Jiří	RNDr., DrSc.	(passed away on 9 April 2010)	
Lukeš	Julius	Prof. RNDr., CSc.	jula@paru.cas.cz	5416
Modrý	David	Doc. MVDr., Ph.D.	modryd@vfu.cz	5408
Moravec	František	RNDr., DrSc.	moravec@paru.cas.cz	5432
Nebesářová	Jana	Ing., CSc.	nebe@paru.cas.cz	5402
Oborník	Miroslav	Doc. Ing., Ph.D.	obornik@paru.cas.cz	5428

Oros	Mikuláš	RNDr., Ph.D.	oros@saske.sk	5431
Orosová	Martina	RNDr., Ph.D.	lakatkam@yahoo.com	5484
Pakandl	Michal	RNDr., CSc.	(till December 2009)	
Rudenko	Nataliia	Ph.D.	natasha@paru.cas.cz	5446
Růžek	Daniel	RNDr., Ph.D.	ruzekd@paru.cas.cz	5451
Sak	Bohumil	RNDr., Ph.D.	casio@paru.cas.cz	5419
Salát	Jiří	RNDr., Ph.D.	george@paru.cas.cz	5458
Scholz	Tomáš	Prof. RNDr., CSc.	tscholz@paru.cas.cz	5403, 5431
Sojka	Daniel	RNDr., Ph.D.	dsojka@seznam.cz	5476
Škeříková	Andrea	RNDr., Ph.D.	andrea@paru.cas.cz (maternity leave)	5463
Štefka	Jan	RNDr., Ph.D.	stefka@paru.cas.cz	5409
Trantírek	Lukáš	Mgr., Ph.D.	trant@prf.jcu.cz	2270, 2275
Trantírková	Silvie	RNDr., Ph.D.	fosil@paru.cas.cz	2270, 2275
Vancová	Marie	Mgr., Ph.D.	vancova@paru.cas.cz	5938, 5485
Vávra	Jiří	Prof. RNDr., DrSc.	vavra@paru.cas.cz	5994
Votýpka	Jan	Mgr., Ph.D.	votypka@paru.cas.cz	5435
Zíková	Alena	RNDr., Ph.D.	azikova@paru.cas.cz	5482, 5932

PhD students

Ash	Anirban	MSc.	anirbanash@gmail.com	5431
Bartošová	Pavla	Mgr.	bartosova@paru.cas.cz	5425
Bendová	Jana	Mgr.	(till March 2008)	
Bojanala	Nagagireesh	MSc.	gireesh@paru.cas.cz	5472, 5481
Brabec	Jan	RNDr.	brabcak@paru.cas.cz	5428
Černá	Kateřina	RNDr.	(till February 2009)	
Franta	Zdeněk	Mgr.	zdeny@paru.cas.cz	5453, 5476
Hönig	Václav	Mgr.	honig@paru.cas.cz	5465
Horáčková	Jana	Mgr.	(till July 2009)	
Horká	Helena	RNDr.	helca@paru.cas.cz	5453, 5457
Changmai	Piya	Mgr.	jihjibloy@yahoo.com	5439
Chmelař	Jindřich	Mgr.	chmelar@paru.cas.cz	5463
Chrudimská	Tereza	Mgr.	terezam@paru.cas.cz	5447
Chrudimský	Tomáš	Mgr.	tomas.chrudimsky@gmail.com	5448
Kořený	Luděk	Mgr.	furcifer@centrum.cz	5428
Kručinská	Jitka	Mgr.	jitka.krucinska@gmail.com	5428
Kvičerová	Jana	MVDr.	(till December 2009)	5409
Long	Shaojun	MSc.	(till December 2009)	5439
Martinů	Jana	RNDr.	martinu@paru.cas.cz	5409
Mendoza-Palmero	Carlos	MSc.	cmpamtheus@yahoo.es	5437
Nováková	Eva	Bc.	novaeva@paru.cas.cz	5409
Paris	Zdeněk	Mgr.	parda@paru.cas.cz	5439
Pěničková	Helena	Mgr.	penich00@paru.cas.cz	5490
Skallová	Anna	RNDr.	(till April 2009)	
Soldánová	Miroslava	Mgr.	mirka.sol@seznam.cz	5430

Šťastná	Hana	Mgr.	hanka@paru.cas.cz	5467
Vávrová	Zuzana	Ing.	zuzavavrova@seznam.cz	5416, 5439
Verner	Zdeněk	Mgr.	zdenek@paru.cas.cz	5439

Research assistants (with a university degree)

Benkovičová	Vladimíra	Mgr.	(till September 2008)	
Bílý	Tomáš	Bc.	thomass@paru.cas.cz	5402, 5498
Dvořáková	Helena	Ing.	brazda@paru.cas.cz (maternity leave)	5414
Flegontová	Olga	Mgr.	olga@paru.cas.cz	5416
Gelnarová	Jana	Mgr., CSc.	(passed away on 30 September 2008)	
Golovchenko	Maryna	MSc.	marina@paru.cas.cz	5446
Grunclová	Lenka	RNDr., Ph.D.	ferda@paru.cas.cz	5489, 5476
Hanzliková Vašková	Dana	RNDr., Ph.D.	dhv@paru.cas.cz	5406
Hlásková	Lenka	Ing.	hlaskova.lenka@seznam.cz (maternity leave)	5471
Jiroutová	Kateřina	Mgr., Ph.D.	muchomura@yahoo.com (maternity leave)	5428
Kučerová	Věra	Mgr.	(till December 2009)	
Květoňová	Dana	RNDr.	dana@paru.cas.cz	5419
Langhans	Jan	Bc.	langhans@paru.cas.cz	5995
Loosová	Gabriela	Ing.	gabi@paru.cas.cz	5467
Navarová	Michaela	Bc.	mnavarova@prf.jcu.cz	2228
Panicucci	Brian, Paul	Bc.	bpanicucci@paru.cas.cz	5482, 5932
Pecková	Hana	RNDr.	pecka@paru.cas.cz	5411
Kriegová	Eva	RNDr.	(maternity leave)	
Růžička	Petr	Bc.	ruzicka84@yahoo.com	5439, 5416
Řepová	Radmila	Ing.	radmilarepova@seznam.cz	5410
Slavíková	Veronika	Bc.	v.slavikova@vte.cz	5457
Škoríková	Blanka	Ing.	skorikova@paru.cas.cz	5410
Tesařová	Martina	Bc.	holland@paru.cas.cz	5440

Undergraduate students (part time contracted)

Bučinská	Lenka	Bc.	lelibu@paru.cas.cz	5440
Číčová	Zdeňka	Bc.	(till August 2009)	
Horáčková	Eva	Bc.	(till June 2009)	
Janouškovec	Jan	Bc.	(till January 2008)	
Kaiserová	Pavlína	Bc.	mysi@paru.cas.cz	5401
Novotná	Lucie	Bc.	luluc.6@seznam.cz	5416
Poliak	Pavel	Bc.	pavel.poliak@centrum.cz	5416
Škodová	Ingrid	Bc.	(till July 2008)	
Tyml	Tomáš	Bc.	tom@paru.cas.cz	5414
Týč	Jiří	Bc.	imejl.xyz@centrum.cz	5416

Technicians (without a university degree)

Borovková	Martina		borovkova@paru.cas.cz	5430
Cifreundová	Gabriela		gabac@paru.cas.cz	5439, 5416
Dean	Jason		dean@paru.cas.cz	5444, 5994
Erhart	Jan		erhart@paru.cas.cz	5438
Fučíková	Marie		masafucikova@paru.cas.cz	5413
Husáková	Irena			5401
Kreimová	Marie		(till December 2008)	
Malinová	Olga		(till June 2008)	
Masařová	Petra		masarova@paru.cas.cz (maternity leave)	5442
Pešková	Helena		(till August 2009)	
Řezníčková	Eva		(till December 2009)	
Šprincl	Ludvík		sprincl@paru.cas.cz	5466
Štifterová	Lenka		stif@paru.cas.cz	5449
Vaněček	Jiří		vanecek@paru.cas.cz	5440
Váchová	Marie		(till January 2008)	
Vášová	Jana		anakonda@paru.cas.cz (maternity leave)	5439
Výletová	Eva		vyletova@paru.cas.cz	5462

Administration associates

Franková	Eva		eva@paru.cas.cz	5403
Jungwirthová	Marcela	Ing.	jungwin00@bf.jcu.cz (maternity leave)	2228

Workers (craftsmen, cleaning women, laboratory workers)

Douda	Tomáš		douda@paru.cas.cz	5401
Jungwirthová	Jana			5403
Marešová	Lenka			5461
Němcová	Zuzana			5461
Reitingerová	Ivana			5474
Sukdoláková	Drahoslava			5475
Šedlová	Iva		(till September 2008)	
Šílená	Stojanka Drakova		(till December 2009)	
Vodička	Ivan		vodicka@paru.cas.cz	5400

Publication activities

2008

Chapters in monographs

1. **DYKOVÁ I.** 2008: Amoeboid protists as parasites of fish. In: J.C. Eiras, H. Segner, T. Wahli and B.G. Kapoor (Eds.), Fish Diseases. Vol. 1, Chapter 8. Science Publishers, Enfield, New Hampshire, USA, pp. 397–420.
2. **GRUBHOFFER L.**, REGO R.O.M., **HAJDUŠEK O.**, **HYPŠA V.**, KOVÁŘ V., **RUDENKO N.**, OLIVER J.H. Jr. 2008: Tick lectins and fibrinogen-related proteins. In: A.S. Bowman and P.A. Nuttall (Eds.), Ticks: Biology, Disease and Control. Cambridge University Press, Cambridge, UK, pp. 127–142.
3. **HYPŠA V.**, **NOVÁKOVÁ E.** 2008: Insect symbionts and molecular phylogenetics. In: K. Bourtzis and T.A. Miller (Eds.), Insect Symbiosis. Vol. 3. CRC Press, Boca Raton, Florida, USA, pp. 1–32.
4. **LOM J.** 2008: Microsporidia. In: J.C. Eiras, H. Segner, T. Wahli and B.G. Kapoor (Eds.), Fish Diseases. Vol. 1, Chapter 7. Science Publishers, Enfield, New Hampshire, USA, pp. 351–395.
5. **SCHOLZ T.** 2008: Family Opisthorchiidae Looss, 1899. In: R.A. Bray, D.I. Gibson and A. Jones (Eds.), Keys to the Trematoda. Vol. 3. CABI, Wallingford, UK, pp. 9–49.

Papers in journals with impact factor

1. **BARTOŠOVÁ P.**, TIRJAKOVÁ E. 2008: Diversity and ecology of ciliates (Alveolata: Ciliophora) living in the bark and decaying wood mass in Slovakia. *Acta Protozoologica* 47: 173–187. [IF = 1.013]
2. BERKOVÁ Z., JIRÁK D., ZACHAROVOVÁ K., KŘÍŽ J., LODEREROVÁ A., GIRMAN P., KOBLAS T., DOVOLILOVÁ E., **VANCOVÁ M.**, HÁJEK M., SAUDEK F. 2008: Labeling of pancreatic islets with iron oxide nanoparticles for *in vivo* detection with magnetic resonance. *Transplantation* 85: 155–159. [IF = 3.816]
3. BOUZID W., **ŠTEFKA J.**, **HYPŠA V.**, LEK S., **SCHOLZ T.**, LEGAL L., BEN HASSINE O. K., LOOT G. 2008: Geography and host specificity: two forces behind the genetic structure of the freshwater fish parasite *Ligula intestinalis* (Cestoda: Diphyllobothriidae). *International Journal for Parasitology* 38: 1465–1479. [IF = 3.752]
4. BOWLER C., ALLEN A.E., BADGER J.H., GRIMWOOD J., JABBARI K., KUO A., MAHESWARI U., MARTENS C., MAUMUS F., OTILLAR R.P., RAYKO E., SALAMOV A., VANDEPOELE K., BESZTERI B., GRUBER A., HEIJDE M., KATINKA M., MOCK T., VALENTIN K., VERRET F., BERGES J.A., BROWNLEE C., CADORET J.-P., CHIOVITTI A., CHOI C.-J., COESEL S., DE MARTINO A., DETTER J.C., DURKIN C., FALCIATORE A., FOURNET J., HARUTA M., HUYSMAN M.J.J., JENKINS B.D., **JIROUTOVÁ K.**, JORGENSEN R.E., JOUBERT Y., KAPLAN A., KRÖGER N., KROTH P.G., LA ROCHE J., LINDQUIST E., LOMMER M., MARTIN–JÉZÉQUEL V., LOPEZ P.J., LUCAS S., MANGOGNA M., MCGINNIS K., MEDLIN L.K., MONTSANT A., OUDOT–LE SECQ M.-P., NAPOLI C., **OBORNÍK M.**, SCHNITZLER PARKER M., PETIT J.-L., PORCEL B.M., POULSEN N., ROBISON M., RYCHLEWSKI L., RYNEARSON T.A., SCHMUTZ J., SHAPIRO H., SIAUT M., STANLEY M., SUSSMAN M.R., TAYLOR A.R., VARDI A., VON DASSOW P., VYVERMAN W., WILLIS A., WYRWICZ L.S., ROKHSAR D.S., WEISSENBACH J., ARMBRUST E.V., GREEN B.R., VAN DE PEER Y., GRIGORIEV I.V. 2008: The *Phaeodactylum* genome reveals the evolutionary history of diatom genomes. *Nature* 456: 239–244. [IF = 31.434]

5. **BRUMOVSKÁ E.**, SYCHROVSKÝ V., VOKÁČOVÁ Z., ŠPONER J., SCHNEIDER B., **TRANTÍREK L.** 2008: Effect of local sugar and base geometry on (13)C and (15)N magnetic shielding anisotropy in DNA nucleosides. *Journal of Biomolecular NMR* 42: 209–223. [IF = 1.492]

6. **CHMELAŘ J.**, **KOPECKÝ J.**, ANDERSON J.M., VALENZUELA J.G., JOCHIM R.C., MU J. 2008: Insight into the sialome of the castor bean tick, *Ixodes ricinus*. *BMC Genomics* 9: 233, 21 pp. [IF = 3.926]

7. **CHOCHOLOVÁ E.**, **JIRKŮ M.**, **LUKEŠ J.** 2008: A diagnostic assay based on variable intergenic region distinguishes between *Leishmania donovani* and *Leishmania infantum*. *Folia Parasitologica* 55: 75–78. [IF = 1.307]

8. COESEL S., **OBORNÍK M.**, VARELA J., FALCIATORE A., BOWLER C. 2008: Evolutionary origins and functions of the carotenoid biosynthetic pathway in marine diatoms. *PLoS ONE* 3(8) e2896, 16 pp.

9. DE CHAMBRIER A., MARIAUX J., SÈNE A., MAHMOUD Z.N., **SCHOLZ T.** 2008: *Sandonella sandoni* (Lynsdale, 1960), an enigmatic and morphologically unique cestode parasitic in the osteoglossiform fish *Heterotis niloticus* in Africa. *Journal of Parasitology* 94: 202–211. [IF = 1.165]

10. DE CHAMBRIER A., **SCHOLZ T.** 2008: Tapeworms (Cestoda: Proteocephalidea) of firewood catfish *Sorubimichthys planiceps* (Siluriformes: Pimelodidae) from the Amazon River. *Folia Parasitologica* 55: 17–28. [IF = 1.307]

11. **DYKOVÁ I.**, **FIALA I.**, **DVOŘÁKOVÁ H.**, **PECKOVÁ H.** 2008: Living together: the marine amoeba *Thecamoeba hilla* Schaeffer, 1926 and its endosymbiont *Labyrinthula* sp. *European Journal of Protistology* 44: 308–316. [IF = 1.000]

12. **DYKOVÁ I.**, **FIALA I.**, **PECKOVÁ H.** 2008: *Neoparamoeba* spp. and their eukaryotic endosymbionts similar to *Perkinsela amoebae* (Hollande, 1980): coevolution demonstrated by SSU rRNA gene phylogenies. *European Journal of Protistology* 44: 269–277. [IF = 1.000]

13. **DYKOVÁ I.**, **FIALA I.**, **PECKOVÁ H.**, **DVOŘÁKOVÁ H.** 2008: Phylogeny of flabellulids inferred from SSU rDNA sequences of the type strain of *Flabellula citata* Schaeffer, 1926 and newly isolated strains of marine amoebae. *Folia Parasitologica* 55: 256–264. [IF = 1.307]

14. **DYKOVÁ I.**, **PECKOVÁ H.**, **KOSTKA M.** 2008: Introduction of *Mayorella gemmifera* Schaeffer, 1926 into phylogenetic studies of Amoebozoa. *Acta Protozoologica* 47: 205–210. [IF = 1.013]

15. **FALTÝNKOVÁ A.**, GIBSON D.I., KOSTADINOVA A. 2008: A revision of *Patagifer* Dietz, 1909 (Digenea: Echinostomatidae) and a key to its species. *Systematic Parasitology* 70: 159–183. [IF = 0.927]

16. **FALTÝNKOVÁ A.**, GIBSON D.I., KOSTADINOVA A. 2008: A revision of *Petasiger* Dietz, 1909 (Digenea: Echinostomatidae) and a key to its species. *Systematic Parasitology* 71: 1–40. [IF = 0.927]

17. **FALTÝNKOVÁ A.**, VALTONEN E.T., KARVONEN A. 2008: Spatial and temporal structure of the trematode component community in *Valvata macrostoma* (Gastropoda, Prosobranchia). *Parasitology* 135: 1691–1699. [IF = 2.071]

18. **FALTÝNKOVÁ A.**, NAŠINCOVÁ V., **KABLÁSKOVÁ L.** 2008: Larval trematodes (Digenea) of planorbid snails (Gastropoda: Pulmonata) in Central Europe: a survey of species and key to their identification. *Systematic Parasitology* 69: 155–178. [IF = 0.927]

19. **FIŠEROVÁ L.**, **ČERNÁ K.**, **HORKÁ H.**, **KOPECKÝ J.** 2008: Two ways of experimental infection of *Ixodes ricinus* ticks (Acari: Ixodidae) with spirochetes of *Borrelia burgdorferi* sensu lato complex. *Folia Parasitologica* 55: 150–154. [IF = 1.307]

20. FOITOVÁ I., KOUBKOVÁ B., **BARUŠ V.**, NURCAHYO W. 2008: Presence and species identification of the gapeworm *Mammomonogamus laryngeus* (Railliet, 1899) (Syngamidae: Nematoda) in a semi-wild population of Sumatran orangutan (*Pongo abelii*) in Indonesia. *Research in Veterinary Science* 84: 232–236. [IF = 1.384]

21. GÖTZ M.G., JAMES K.E., HANSELL E., DVOŘÁK J., SESHAADRI A., **SOJKA D.**, **KOPÁČEK P.**, MCKERROW J.H., CAFFREY C.R., POWERS J.C. 2008: Aza-peptidyl Michael acceptors. A new class

of potent and selective inhibitors of asparaginyl endopeptidases (legumains) from evolutionarily diverse pathogens. *Journal of Medicinal Chemistry* 51: 2816–2832. [IF = 4.898]

22. GULER J.L., **KRIEGOVÁ E.**, SMITH T.K., **LUKEŠ J.**, ENGLUND P.T. 2008: Mitochondrial fatty acid synthesis is required for normal mitochondrial morphology and function in *Trypanosoma brucei*. *Molecular Microbiology* 67: 1125–1142. [IF = 5.213]
23. **HASHIMI H.**, **ZÍKOVÁ A.**, PANIGRAHI A.K., STUART K.D., **LUKEŠ J.** 2008: TbRGG1, an essential protein involved in kinetoplastid RNA metabolism that is associated with a novel multiprotein complex. *RNA* 14: 970–980. [IF = 5.018]
24. HODOVÁ I., **BARUŠ V.**, TUKAČ V. 2008: Note on morphology of two nematode species *Ascaridia hermaphrodita* and *Ascaridia platyceri* (Nematoda): scanning electron microscope study. *Helminthologia*: 45: 109–113. [IF = 0.443]
25. **JELÍNKOVÁ A.**, LICOIS D., **PAKANDL M.** 2008: The endogenous development of the rabbit coccidium *Eimeria exigua* Yakimoff, 1934. *Veterinary Parasitology* 156: 168–172. [IF = 2.039]
26. **JIRKŮ M.**, VALIGUROVÁ A., **KOUDELA B.**, KŘÍŽEK J., **MODRÝ D.**, ŠLAPETA J. 2008: New species of *Cryptosporidium* Tyzzer, 1907 (Apicomplexa) from amphibian host: morphology, biology and phylogeny. *Folia Parasitologica* 55: 81–94. [IF = 1.307]
27. KRÁĽOVÁ-HROMADOVÁ I., ŠPAKULOVÁ M., **HORÁČKOVÁ E.**, TURČEKOVÁ Ľ., NOVOBILSKÝ A., BECK R., **KOUDELA B.**, MARINCULIĆ A., RAJSKÝ D., PYBUS M. 2008: Sequence analysis of ribosomal and mitochondrial genes of the giant liver fluke *Fascioloides magna* (Trematoda: Fasciolidae): intraspecific variation and differentiation from *Fasciola hepatica*. *Journal of Parasitology* 94: 58–67. [IF = 1.165]
28. **KUCHTA R.**, **SCHOLZ T.** 2008: A new triaenophorid tapeworm from blackfish *Centrolophus niger*. *Journal of Parasitology* 94: 500–504. [IF = 1.165]
29. **KUCHTA R.**, **SCHOLZ T.**, BRABEC J., BRAY R.A. 2008: Suppression of the tapeworm order Pseudophyllidea (Platyhelminthes: Eucestoda) and the proposal of two new orders, Bothriocephalidea and Diphyllobothriidea. *International Journal for Parasitology* 38: 49–55. [IF = 3.752]
30. **KUCHTA R.**, **SCHOLZ T.**, BRABEC J., JIRSOVÁ D., GUSTINELLI A. 2008: Bothriocephalidean tapeworms (Cestoda) from the blackfish, *Centrolophus niger* (Perciformes: Centrolophidae). *Folia Parasitologica* 55: 111–121. [IF = 1.307]
31. **KUCHTA R.**, **SCHOLZ T.**, BRAY R.A. 2008: Revision of the order Bothriocephalidea Kuchta, Scholz, Brabec & Bray, 2008 (Eucestoda) with amended generic diagnoses and keys to families and genera. *Systematic Parasitology* 71: 81–136. [IF = 0.927]
32. **KVÁČ M.**, HOFMANNOVÁ L., BERTOLINO S., WAUTERS L., TOSI G., **MODRÝ D.** 2008: Natural infection with two genotypes of *Cryptosporidium* in red squirrels (*Sciurus vulgaris*) in Italy. *Folia Parasitologica* 55: 95–99. [IF = 1.307]
33. **KVÁČ M.**, **SAK B.**, **KVĚTOŇOVÁ D.**, **DITRICH O.**, HOFMANNOVÁ L., **MODRÝ D.**, VÍTOVEC J., XIAO L. 2008: Infectivity, pathogenicity, and genetic characteristics of mammalian gastric *Cryptosporidium* spp. in domestic ruminants. *Veterinary Parasitology* 153: 363–367. [IF = 2.039]
34. **KVIČEROVÁ J.**, **PAKANDL M.**, **HYPŠA V.** 2008: Phylogenetic relationships among *Eimeria* spp. (Apicomplexa, Eimeriidae) infecting rabbits: evolutionary significance of biological and morphological features. *Parasitology* 135: 443–452. [IF = 2.071]
35. **LAI D.-H.**, **HASHIMI H.**, LUN Z.-R., AYALA F.J., **LUKEŠ J.** 2008: Adaptations of *Trypanosoma brucei* to gradual loss of kinetoplast DNA: *Trypanosoma equiperdum* and *Trypanosoma evansi* are petite mutants of *T. brucei*. *Proceedings of the National Academy of Science of the United States of America* 105: 1999–2004. [IF = 9.380]

36. **LEVRON C.**, PODDUBNAYA L.G., **KUCHTA R.**, FREEMAN M., **SCHOLZ T.** 2008: Ultrastructure of the tegument of the cestode *Paraechinophallus japonicus* (Bothriocephalidea: Echinophallidae), a parasite of the bathypelagic fish *Psenopsis anomala*. *Invertebrate Biology* 127: 153–161. [IF = 1.217]

37. **LEVRON C.**, PODDUBNAYA L.G., **KUCHTA R.**, FREEMAN M., WANG Y.-H. **SCHOLZ T.** 2008: SEM and TEM study of the armed male terminal genitalia of the tapeworm *Paraechinophallus japonicus* (Cestoda: Bothriocephalidea). *Journal of Parasitology* 94: 803–810. [IF = 1.165]

38. **LEVRON C.**, **SCHOLZ T.**, DEZFULI B.S. 2008: Ultrastructure of microtriches on the scolex of *Cyathocephalus truncatus* (Cestoda: Spathebothriidea). *Folia Parasitologica* 55: 309–312. [IF = 1.307]

39. **LONG S.**, **JIRKŮ M.**, AYALA F.J., **LUKEŠ J.** 2008: Mitochondrial localization but not processing of human frataxin is essential for a rescue of frataxin deficiency in the excavate flagellate *Trypanosoma brucei*. *Proceedings of the National Academy of Science of the United States of America* 105: 13468–13473. [IF = 9.380]

40. **LONG S.**, **JIRKŮ M.**, MACH J., GINGER M.L., ŠUŤÁK R., RICHARDSON D., TACHEZY J., **LUKEŠ J.** 2008: Ancestral roles of eukaryotic frataxin: mitochondrial frataxin function and heterologous expression of hydrogenosomal *Trichomonas* homologs in trypanosomes. *Molecular Microbiology* 69: 94–109. [IF = 5.213]

41. **LONG S.**, **VÁVROVÁ Z.**, **LUKEŠ J.** 2008: The import and function of diatom and plant frataxins in the mitochondrion of *Trypanosoma brucei*. *Molecular and Biochemical Parasitology* 162: 100–104. [IF = 2.951]

42. MALETZKY A., MIKULÍČEK P., FRANZEN M., GOLDSCHMID A., GRUBER H.-J., **HORÁK A.**, KYEK M. 2008: Hybridization and introgression between two species of crested newts (*Triturus cristatus* and *T. carnifex*) along contact zones in Germany and Austria: morphological and molecular data. *Herpetological Journal* 18: 1–15. [IF = 0.764]

43. MAN P., **KOVÁŘ V.**, **ŠTĚRBA J.**, STROHALM M., KAVAN D., **KOPÁČEK P.**, **GRUBHOFFER L.**, HAVLÍČEK V. 2008: Deciphering Dorin M glycosylation by mass spectrometry. *European Journal of Mass Spectrometry* 14: 345–354. [IF = 1.167]

44. **MARTINŮ J.**, **DUSBÁBEK F.**, LITERÁK I. 2008: A review of mites of the genus *Neharpyrhynchus* Fain (Acari: Harpyrhynchidae) – ectoparasites of wild birds, including description of four new species. *International Journal of Acarology* 34: 197–209. [IF = 0.438]

45. MAŠOVÁ Š., **BARUŠ V.**, HODOVÁ I., MATĚJUSOVÁ I., KOUBEK P., KOUBKOVÁ B. 2008: Morphometric and molecular characterization of *Parapharyngodon echinatus* (Nematoda, Pharyngodonidae) from the Senegal gecko (*Tarentola parvicarinata*). *Acta Parasitologica* 53: 274–283. [IF = 0.748]

46. **MODRÝ D.**, PETRŽELKOVÁ K., **JIRKŮ M.**, KOUBEK P. 2008: Two new species of *Eimeria* Schneider, 1875 (Apicomplexa: Eimeriidae) from *Gerbilliscus guineae* Thomas (Rodentia: Gerbillinae) in the Niokolo Koba National Park, Senegal. *Systematic Parasitology* 71: 223–228. [IF = 0.927]

47. MOORE R.B., **OBORNÍK M.**, **JANOUŠKOVEC J.**, **CHRUDIMSKÝ T.**, **VANCOVÁ M.**, GREEN D.H., WRIGHT S.W., DAVIES N.W., BOLCH C.J.S., HEIMANN K., ŠLAPETA J., HOEGH-GULDBERG O., LOGSDON J.M., CARTER D.A. 2008: A photosynthetic alveolate closely related to apicomplexan parasites. *Nature* 451: 959–963. [IF = 31.434]

48. **MORAVEC F.** 2008: Misidentification of nematodes from the Chinese sleeper *Perccottus glenii* in Europe. *Bulletin of the European Association of Fish Pathologists* 28: 86–87. [IF = 0.430]

49. **MORAVEC F.** 2008: Systematic status of *Philometra jordanoi* (López-Neyra, 1951) and some other congeneric species previously identified as *Philometra lateolabracis* (Yamaguti, 1935) (Nematoda: Philometridae). *Folia Parasitologica* 55: 159–160. [IF = 1.307]

50. **MORAVEC F.**, CROSBY D.M., DE BURON I., GONZÁLEZ-SOLÍS D., ROUMILLAT W.A. 2008: Three new species of philometrids (Nematoda: Philometridae) from centrarchid fishes in the USA. *Journal of Parasitology* 94: 1103–1113. [IF = 1.165]

51. **MORAVEC F.**, DE BURON I., BAKER T.G., GONZÁLEZ-SOLÍS D. 2008: Some gonad-infecting species of *Philometra* (Nematoda, Philometridae) from offshore fishes of South Carolina and Georgia, USA, including *Philometra charlestonensis* sp. nov. from the scamp *Mycteroperca phenax*. *Acta Parasitologica* 53: 382–391. [IF = 0.748]

52. **MORAVEC F.**, GAGLIO G., PANEBIANCO A., GIANNETTO S. 2008: Two species of *Philometra* (Nematoda: Philometridae) from sparid fishes (porgies) off Sicily, Italy, including *Philometra obladae* sp. n. from the body cavity of *Oblada melanura* (Sparidae). *Parasitology Research* 104: 55–61. [IF = 1.473]

53. **MORAVEC F.**, JUSTINE J.-L. 2008: Some philometrid nematodes (Philometridae), including four new species of *Philometra*, from marine fishes off New Caledonia. *Acta Parasitologica* 53: 369–381. [IF = 0.748]

54. **MORAVEC F.**, LAOPRASERT T. 2008: Redescription of *Ichthyouris bursata* Moravec & Prouza, 1995 (Nematoda: Pharyngodonidae), a parasite of wild and aquarium-reared discus *Symphysodon* spp. (Osteichthyes). *Systematic Parasitology* 71: 137–143. [IF = 0.927]

55. **MORAVEC F.**, LORBER J., KONEČNÝ R. 2008: *Cucullanus maldivensis* n. sp. (Nematoda: Cucullanidae) and some other adult nematodes from marine fishes off the Maldive Islands. *Systematic Parasitology* 70: 61–69. [IF = 0.927]

56. **MORAVEC F.**, MAGI M., MACCHIONI F. 2008: Redescription of the gonad-infecting nematode *Philometra saltatrix* Ramachandran, 1973 (Philometridae) based on specimens from the type host *Pomatomus saltatrix* (L.) (Osteichthyes) from the Tuscan Sea, Italy. *Folia Parasitologica* 55: 219–223. [IF = 1.307]

57. **MORAVEC F.**, MONTOYA-MENDOZA J., SALGADO-MALDONADO G. 2008: A new genus and species of philometrid (Nematoda) from the subcutaneous tissue of the crevalle jack, *Caranx hippos* (Osteichthyes), from the southern Gulf of Mexico. *Journal of Parasitology* 94: 1346–1350. [IF = 1.165]

58. **MORAVEC F.**, NIE P., WANG G. 2008: Redescription and systematic status of *Neocapillaria phoxini* Yu et Wang, 1994 (Nematoda: Capillariidae). *Folia Parasitologica* 55: 316–318. [IF = 1.307]

59. **MORAVEC F.**, ŘÍHA M., **KUCHTA R.** 2008: Two new nematode species, *Paragendria papuanensis* sp. n. (Seuratoidea) and *Rhabdochona papuanensis* sp. n. (Thelazioidea), from freshwater fishes in Papua New Guinea. *Folia Parasitologica* 55: 127–135. [IF = 1.307]

60. **MORAVEC F.**, SANTOS M.D., BRASIL-SATO M.C. 2008: Redescription of *Cystidicoloides fischeri* based on specimens from piranhas in Brazil, and erection of a new genus (Nematoda: Cystidicolidae). *Journal of Parasitology* 94: 889–897. [IF = 1.165]

61. **MORAVEC F.**, **SCHOLZ T.**, **KUCHTA R.**, GRYGIER M.J. 2008: Female morphology of *Philometra parasiluri* (Nematoda, Philometridae), an ocular parasite of the Amur catfish *Silurus asotus* in Japan. *Acta Parasitologica* 53: 153–157. [IF = 0.748]

62. **MORAVEC F.**, SHIMAZU T. 2008: Redescription of the female of *Mexiconema liobagri* (Nematoda: Daniconematidae), a little-known parasite of the rare endemic catfish *Liobagrus reinii* (Amblycipitidae), in Japan. *Helminthologia* 45: 106–108. [IF = 0.443]

63. MYŠKOVÁ J., **VOTÝPKA J.**, VOLF P. 2008: *Leishmania* in sand flies: comparison of quantitative polymerase chain reaction with other techniques to determine the intensity of infection. *Journal of Medical Entomology* 45: 133–138. [IF = 1.967]

64. NEUMAYEROVÁ H., **KOUDELA B.** 2008: Effects of low and high temperatures on infectivity of *Cryptosporidium muris* oocysts suspended in water. *Veterinary Parasitology* 153: 197–202. [IF = 2.039]

65. OLSON P.D., PODDUBNAYA L.G., LITTLEWOOD D.T.J., **SCHOLZ T.** 2008: On the position of *Archigetes* and its bearing on the early evolution of tapeworms. *Journal of Parasitology* 94: 898–904. [IF = 1.165]

66. **OROS M.**, HANZELOVÁ V., **SCHOLZ T.**, MACKIEWICZ J.S. 2008: Phylogenetic relationships of the monozoic tapeworms (Eucestoda: Caryophyllidea) inferred from morphological characters. *Systematic Parasitology* 70: 1–14. [IF = 0.927]

67. ORTEGA-OLIVARES M.P., BARRERA-GUZMÁN A.O., **HAASOVÁ I.**, SALGADO-MALDONADO G., GUILLÉN-HERNÁNDEZ S., **SCHOLZ T.** 2008: Tapeworms (Cestoda: Gryporhynchidae) of fish-eating birds (Ciconiiformes) from Mexico: new host and geographical records. *Comparative Parasitology* 75: 182–195. [IF = 0.477]

68. **PAKANDL M.**, **HLÁSKOVÁ L.**, POPLŠTEIN M., CHROMÁ V., VODIČKA T., **SALÁT J.**, MUCKSOVÁ J. 2008: Dependence of the immune response to coccidiosis on the age of rabbit suckling. *Parasitology Research* 103: 1265–1271. [IF = 1.473]

69. **PAKANDL M.**, **HLÁSKOVÁ L.**, POPLŠTEIN M., NEVEČEŘALOVÁ M., VODIČKA T., **SALÁT J.**, MUCKSOVÁ J. 2008: Immune response to rabbit coccidiosis: a comparison between infections with *Eimeria flavescens* and *Eimeria intestinalis*. *Folia Parasitologica* 55: 1–6. [IF = 1.307]

70. PARK J.-K., **MORAVEC F.** 2008: Redescription of *Cucullanus robustus* (Nematoda: Cucullanidae) from the conger eel *Conger myriaster* off Korea. *Zootaxa* 1729: 1–7. [IF = 0.740]

71. PÍSEK L., TRÁVNÍČEK J., **SALÁT J.**, KROUPOVÁ V., SOCH M. 2008: Changes in white blood cells in sheep blood during selenium supplementation. *Veterinární medicína* 53: 255–259. [IF = 0.659]

72. PODDUBNAYA L.G., **SCHOLZ T.**, **KUCHTA R.**, **LEVRON C.**, GIBSON D.I. 2008: Ultrastructure of the surface structures and secretory glands of the rosette attachment organ of *Gyrocotyle urna* (Cestoda: Gyrocotylidea). *Folia Parasitologica* 55: 207–218. [IF = 1.307]

73. REFARDT D., DECAESTECKER E., JOHNSON P.T.J., **VÁVRA J.** 2008: Morphology, molecular phylogeny, and ecology of *Binucleata daphniae* n. g., n. sp. (Fungi: Microsporidia), a parasite of *Daphnia mag*na Straus, 1820 (Crustacea: Branchiopoda). *Journal of Eukaryotic Microbiology* 55: 393–408. [IF = 1.502]

74. **RUDENKO N.**, **GOLOVCHENKO M.**, MOKRÁČEK A., PISKUNOVA N., **RŮŽEK D.**, MALLÁTOVÁ N., **GRUBHOFFER L.** 2008: Detection of *Borrelia bissettii* in cardiac valve tissue of a patient with endocarditis and aortic valve stenosis in the Czech Republic. *Journal of Clinical Microbiology* 46: 3540–3543. [IF = 3.945]

75. **RŮŽEK D.**, BELL-SAKYI L., **KOPECKÝ J.**, **GRUBHOFFER L.** 2008: Growth of tick-borne encephalitis virus (European subtype) in cell lines from vector and non-vector ticks. *Virus Research* 137: 142–146. [IF = 2.429]

76. **RŮŽEK D.**, GRITSUN T.S., FORRESTER N.L., GOULD E.A., **KOPECKÝ J.**, **GOLOVCHENKO M.**, **RUDENKO N.**, **GRUBHOFFER L.** 2008: Mutations in the NS2B and NS3 genes affect mouse neuroinvasiveness of a Western European field strain of tick-borne encephalitis virus. *Virology* 374: 249–255. [IF = 3.539]

77. **SAK B.**, **KVÁČ M.**, HANZLÍKOVÁ D., CAMA V. 2008: First report of *Enterocytozoon bieneusi* infection on a pig farm in the Czech Republic. *Veterinary Parasitology* 153: 220–224. [IF = 2.039]

78. **SALÁT J.**, **JELÍNEK J.**, **CHMELAŘ J.**, **KOPECKÝ J.** 2008: Efficacy of gamma interferon and specific antibody for treatment of microsporidiosis caused by *Encephalitozoon cuniculi* in SCID mice. *Antimicrobial Agents and Chemotherapy* 52: 2169–2174. [IF = 4.716]

79. SANTOS C.P., **MORAVEC F.**, VENTURIERI R. 2008: *Capillostrongyloides arapaimae* sp. n. (Nematoda: Capillariidae), a new intestinal parasite of the arapaima *Arapaima gigas* from the Brazilian Amazon. *Memórias do Instituto Oswaldo Cruz, Rio de Janeiro* 103: 392–395. [IF = 1.450]

80. SASAL P., TARASCHEWSKI H., VALADE P., GRONDIN H., WIELGOSS S., **MORAVEC F.** 2008: Parasite communities in eels of the Island of Reunion (Indian Ocean): a lesson in parasite introduction. *Parasitology Research* 102: 1343–1350. [IF = 1.473]

81. **SCHOLZ T.**, BOANE C., SARAIVA A. 2008: New metacestodes of gryporhynchid tapeworms (Cestoda: Cyclophyllidea) from carp (*Cyprinus carpio* Linnaeus, 1758) from Mozambique, Africa. *Comparative Parasitology* 75: 315–320. [IF = 0.477]

82. **SCHOLZ T.**, DE CHAMBRIER A., **KUCHTA R.** 2008: Redescription of the tapeworm *Monticellia amazonica* de Chambrier et Vaucher, 1997 (Cestoda: Proteocephalidea), a parasite of *Calophysus macropterus* (Siluriformes: Pimelodidae), from the Amazon River. *Acta Parasitologica* 53: 30–35. [IF = 0.748]

83. **SKALLOVÁ A.**, IEZZI G., AMPENBERGER F., KOPF M., **KOPECKÝ J.** 2008: Tick saliva inhibits dendritic cell migration, maturation and function, while promoting development of Th2 responses. *Journal of Immunology* 180: 6186–6192. [IF = 6.000]

84. SLOBODA M., KAMLER M., BULANTOVÁ J., **VOTÝPKA J.**, **MODRÝ D.** 2008: Rodents as intermediate hosts of *Hepatozoon ayorgbor* (Apicomplexa: Adeleina: Hepatozoidae) from the African ball python, *Python regius*? *Folia Parasitologica* 55: 13–16. [IF = 1.307]

85. **SOJKA D.**, **FRANTA Z.**, HORN M., **HAJDUŠEK O.**, CAFFREY C.R., MAREŠ M., **KOPÁČEK P.** 2008: Profiling of proteolytic enzymes in the gut of the tick *Ixodes ricinus* reveals an evolutionarily conserved network of aspartic and cysteine peptidases. *Parasites & Vectors* 2008, 1: 7.

86. ŠOBOTNÍK J., KUDLÍKOVÁ-KŘÍŽKOVÁ I., **VANCOVÁ M.**, MÜNZBERGOVÁ Z., HUBERT J. 2008: Chitin in the peritrophic membrane of *Acarus siro* (Acari: Acaridae) as a target for novel acaricides. *Journal of Economic Entomology* 101: 1028–1033. [IF = 1.346]

87. **ŠORFOVÁ P.**, **ŠKEŘÍKOVÁ A.**, **HYPŠA V.** 2008: An effect of 16S rRNA intercistronic variability on coevolutionary analysis in symbiotic bacteria: molecular phylogeny of *Arsenophonus triatominarum*. *Systematic and Applied Microbiology* 31: 88–100. [IF = 2.582]

88. **ŠTEFKA J.**, **HYPŠA V.** 2008: Host specificity and genealogy of *Polyplax serrata* on *Apodemus* species: a case of parasite duplication or colonisation? *International Journal for Parasitology* 38: 731–741. [IF = 3.752]

89. **ŠTĚRBA J.**, **VANCOVÁ M.**, **RUDENKO N.**, **GOLOVCHENKO M.**, TREMBLAY T.-L., KELLY J.F., MACKENZIE R.C., LOGAN S.M., **GRUBHOFFER L.** 2008: Flagellin and outer surface proteins from *Borrelia burgdorferi* are not glycosylated. *Journal of Bacteriology* 190: 2619–2623. [IF = 3.636]

90. TRAVERSA D., AVOLIO S., **MODRÝ D.**, OTRANTO D., IORIO R., AROCH I., CRINGOLI G., MILILLO P., ALBRECHTOVÁ K., MIHALCA A.D., LAVY E. 2008: Copromicroscopic and molecular assays for the detection of cancer-causing parasitic nematode *Spirocerca lupi*. *Veterinary Parasitology* 157: 108–116. [IF = 2.039]

91. TRAVERSA D., IORIO R., OTRANTO D., **MODRÝ D.**, ŠLAPETA. J. 2008: *Cryptosporidium* from tortoises: genetic characterisation, phylogeny and zoonotic implications. *Molecular and Cellular Probes* 22: 122–128. [IF = 2.196]

92. VALIGUROVÁ A., **JIRKŮ M.**, **KOUDELA B.**, GELNAR M., **MODRÝ D.**, ŠLAPETA J. 2008: Cryptosporidia: epicellular parasites embraced by the host cell membrane. *International Journal for Parasitology* 38: 913–922. [IF = 3.752]

93. VALIGUROVÁ A., **KOUDELA B.** 2008: Morphological analysis of the cellular interactions between the eugregarine *Gregarina garnhami* (Apicomplexa) and the epithelium of its host, the desert locust *Schistocerca gregaria*. *European Journal of Protistology* 44: 197–207. [IF = 1.000]

94. **VOTÝPKA J.**, ŠEBLOVÁ V., RÁDROVÁ J. 2008: Spread of the West Nile virus vector *Culex modestus* and the potential malaria vector *Anopheles hyrcanus* in central Europe. *Journal of Vector Ecology* 33: 269–277. [IF = 1.057]

95. WICHT B., **SCHOLZ T.**, PEDUZZI R., **KUCHTA R.** 2008: First record of human infection with the tapeworm *Diphyllobothrium nihonkaiense* in North America. *American Journal of Tropical Medicine and Hygiene* 78: 235–238. [IF = 2.450]

96. YOUNG N.D., **DYKOVÁ I.**, NOWAK B., MORRISON R.N. 2008: Development of a diagnostic PCR to detect *Neoparamoeba perurans*, agent of amoebic gill disease. *Journal of Fish Diseases* 31: 285–295. [IF = 1.540]

97. YOUNG N.D., **DYKOVÁ I.**, SNEKVIK K., NOWAK B.F., MORRISON R.N. 2008: *Neoparamoeba perurans* is a cosmopolitan aetiological agent of amoebic gill disease. *Diseases of Aquatic Organisms* 78: 217–223. [IF = 1.586]

98. YURCHENKO V.A., **LUKEŠ J.**, TESAŘOVÁ M., **JIRKŮ M.**, MASLOV D.A. 2008: Morphological discordance of the new trypanosomatid species phylogenetically associated with the genus *Crithidia*. *Protist* 159: 99–114. [IF = 3.923]

99. **ZÍKOVÁ A.**, KOPEČNÁ J., SCHUMACHER M.A., STUART K., **TRANTÍREK L.**, **LUKEŠ J.** 2008: Structure and function of the native and recombinant mitochondrial MRP1/MRP2 complex from *Trypanosoma brucei*. *International Journal for Parasitology* 38: 901–912. [IF = 3.752]

2009

Chapters in monographs

1. **OBORNÍK M.** 2009: Identification and Diagnostics of Entomopathogenic Protozoa. In: S.P. Stock, J. Vandenberg, I. Glazer and N. Boemare (Eds.), Insects Pathogens: Molecular Approaches and Techniques, CAB International, Wallingford, UK, pp. 101–128.

Papers in journals with impact factor

1. ACESTOR N., PANIGRAHI A.K., CARNES J., **ZÍKOVÁ A.**, STUART K.D. 2009: The MRB1 complex functions in kinetoplastid RNA. *RNA* 15: 277–286. [IF = 5.198]

2. AHANTARIG A., **RŮŽEK D.**, **VANCOVÁ M.**, JANOWICZ A., **ŠŤASTNÁ H.**, **TESAŘOVÁ M.**, **GRUBHOFFER L.** 2009: Tick-borne encephalitis virus infection of cultured mouse macrophages. *Intervirology* 52: 283–290. [IF = 1.106]

3. ALDHOUN J.A., **FALTÝNKOVÁ A.**, KARVONEN A., HORÁK P. 2009: Schistosomes in the North: a unique finding from a prosobranch snail using molecular tools. *Parasitology International* 58: 314–317. [IF = 1.701]

4. **BARTOŠOVÁ P.**, **FIALA I.**, **HYPŠA V.** 2009: Concatenated SSU and LSU rDNA data confirm the main evolutionary trends within myxosporeans (Myxozoa: Myxosporea) and provide effective tool for their molecular phylogenetics. *Molecular Phylogenetics and Evolution* 53: 81–93. [IF = 3.556]

5. BELL-SAKYI L., **RŮŽEK D.**, GOULD E.A. 2009: Cell lines from the soft tick *Ornithodoros moubata*. *Experimental and Applied Acarology* 49: 209–219. [IF = 1.391]

6. BLASCO-COSTA I., BALBUENA J.A, **KOSTADINOVA A.**, OLSON P.D. 2009: Interrelationships of the Haploporinae (Digenea: Haploporidae): a molecular test of the taxonomic framework based on morphology. *Parasitology International* 58: 263–269. [IF = 1.701]

7. BLASCO-COSTA I., GIBSON D.I., BALBUENA J.A., RAGA J.A., **KOSTADINOVA A.** 2009: A revision of the Haploporinae Nicoll, 1914 (Digenea: Haploporidae) from mullets (Mugilidae): *Haploporus* Looss, 1902 and *Lecithobotrys* Looss, 1902. *Systematic Parasitology* 73: 107–133. [IF = 0.911]

8. BRUŇANSKÁ M., DROBNÍKOVÁ P., **OROS M.** 2009: Vitellogenesis in the cestode *Atractolytocestus huronensis* Anthony, 1958 (Caryophyllidea: Lytocestidae). *Parasitology Research* 105: 647–654. [IF = 1.721]

9. **BUREŠOVÁ V.**, **HAJDUŠEK O.**, **FRANTA Z.**, **SOJKA D.**, **KOPÁČEK P.** 2009: IrAM-An α2-macroglobulin from the hard tick *Ixodes ricinus*: characterization and function in phagocytosis of a potential pathogen *Chryseobacterium indologenes*. *Developmental and Comparative Immunology* 33: 489–498. [IF = 3.290]

10. CÁRDENAS M.Q., **MORAVEC F.**, KOHN A. 2009: First record of *Philometra katsuwoni* (Nematoda, Philometridae), a parasite of skipjack tuna *Katsuwonus pelamis* (Perciformes, Scombridae), off South American Atlantic coast. *Biota Neotropica* 9: 263–266. [IF = 0.513]

11. DE CHAMBRIER A., **SCHOLZ T.**, BELETEW M., MARIAUX J. 2009: A new genus and species of proteocephalidean (Cestoda) from *Clarias* catfishes (Siluriformes: Clariidae) in Africa. *Journal of Parasitology* 95: 160–168. [IF = 1.195]

12. **DYKOVÁ I.**, DE BURON I., **FIALA I.**, ROUMILLAT W. 2009: *Kudoa inornata* sp. n. (Myxosporea: Multivalvulida) from the skeletal muscles of *Cynoscion nebulosus* (Teleostei: Sciaenidae). *Folia Parasitologica* 56: 91–98. [IF = 1.266]

13. **DYKOVÁ I.**, HRUBÁ M., **KOSTKA M.**, **PECKOVÁ H.** 2009: *Filamoeba* sp. isolated from hot-water piping system, a host of legionella closely related to *Legionella micdadei*. *Acta Protozoologica* 48: 321–327. [IF = 0.775]

14. **FALTÝNKOVÁ A.**, KARVONEN A., JYRKKA M., VALTONEN E.T. 2009: Being successful in the world of narrow opportunities: transmission patterns of the trematode *Ichthyocotylurus pileatus*. *Parasitology* 136: 1375–1382. [IF = 1.607]

15. **FOLDYNOVÁ-TRANTÍRKOVÁ S.**, MATULOVÁ J., DOTSCH V., LOHR F., CIRSTEA I., ALEXANDOV K., BREITLING R., **LUKEŠ J.**, **TRANTÍREK L.** 2009: A cost-effective amino-acid-type selective isotope labeling of proteins expressed in *Leishmania tarentolae*. *Journal of Biomolecular Structure & Dynamics* 26: 755–761. [IF = 1.124]

16. FRYE F.L., **MODRÝ D.**, ŠIROKÝ P. 2009: Pathology in practice. *Journal of the American Veterinary Medical Association* 235: 511–512. [IF = 1.714]

17. GAGLIO G., GIANETTO S., PANEBIANCO A., **MORAVEC F.** 2009: First description of the male of *Philometra filiformis* (Nematoda: Philometridae), a gonad-infecting parasite of the marine fish *Pagellus erythrinus* (Sparidae) in Mediterranean. *Folia Parasitologica* 56: 317–318. [IF = 1.266]

18. GILE G.H., **FAKTOROVÁ D.**, CASTLEJOHN C.A., BURGER G., LANG B.F., FARMER M.A., **LUKEŠ J.**, KEELING P.J. 2009: Distribution and phylogeny of EFL and EF-1α in Euglenozoa suggest ancestral co-occurrence followed by differential loss. PLoS ONE 4: e5162. [IF = 4.351]

19. HÄNSEL R., **FOLDYNOVÁ-TRANTÍRKOVÁ S.**, LÄHR F., BUCK J., BONGARTZ E., BAMBERG E., SCHWALBE H., DÖTSCH V., **TRANTÍREK L.** 2009: Evaluation of parameters critical for observing nucleic acids inside living *Xenopus laevis* oocytes by in-cell NMR spectroscopy. *Journal of the American Chemical Society* 131: 15761–15768. [IF = 8.580]

20. **HAJDUŠEK O.**, **SOJKA D.**, **KOPÁČEK P.**, **BUREŠOVÁ V.**, **FRANTA Z.**, ŠAUMAN I., WINZERLING J., **GRUBHOFFER L.** 2009: Knockdown of proteins involved in iron metabolism limits tick reproduction and development. *Proceedings of the National Academy of Science of the United States of America* 106: 1033–1038. [IF = 9.432]

21. **HAJDUŠKOVÁ M.**, JINDRA M., HERMAN M.A., **ASAHINA M.** 2009: The nuclear receptor NHR-25 cooperates with Wnt/β-catenin asymmetry pathway to control T cell differentiation in *C. elegans*. *Journal of Cell Science* 122: 3051–3060. [IF = 6.144]

22. **HASHIMI H.**, **ČÍČOVÁ Z.**, **NOVOTNÁ L.**, **WEN Y.Z.**, **LUKEŠ J.** 2009: Kinetoplastid guide RNA biogenesis is dependent on subunits of the mitochondrial RNA binding complex 1 and mitochondrial RNA polymerase. *RNA* 15: 588–599. [IF = 5.198]

23. HONYS D., REŇÁK D., FECIKOVÁ J., JEDELSKÝ P.L., **NEBESÁŘOVÁ J.**, DOBREV P., ČAPKOVÁ V. 2009: Cytoskeleton-associated large RNP complexes in tobacco male gametophyte (EPPs) are associated with ribosomes and are involved in protein synthesis, processing, and localization. *Journal of Proteome Research* 8: 2015–2031. [IF = 5.132]

24. **HORKÁ H.**, **ČERNÁ-KÝČKOVÁ K.**, **SKALLOVÁ A.**, **KOPECKÝ J.** 2009: Tick saliva affects both proliferation and distribution of *Borrelia burgdorferi* spirochetes in mouse organs and increases

transmission of spirochetes to ticks. *International Journal of Medical Microbiology* 299: 373–380. [IF = 2.802]

25. HORN M., NUSSBAUMEROVÁ M., ŠANDA M., KOVÁŘOVÁ Z., SRBA J., **FRANTA Z.**, **SOJKA D.**, BOGYO M., CAFFREY C.R., **KOPÁČEK P.**, MAREŠ M. 2009: Hemoglobin digestion in blood-feeding ticks: mapping a multipeptidase pathway by functional proteomics. *Chemistry & Biology* 16: 1053–1063. [IF = 6.523]

26. **JIRKŮ M.**, **JIRKŮ M.**, **OBORNÍK M.**, **LUKEŠ J.**, **MODRÝ D.** 2009: A model for taxonomic work on homoxenous coccidia: redescription, host specificity, and molecular phylogeny of *Eimeria ranae* Dobell, 1909, with a review of anuran-host *Eimeria* (Apicomplexa: Eimeriorina). *Journal of Eukaryotic Microbiology* 56: 39–51. [IF = 2.355]

27. **JIRKŮ M.**, **JIRKŮ M.**, **OBORNÍK M.**, **LUKEŠ J.**, **MODRÝ D.** 2009: *Goussia* Labbé, 1896 (Apicomplexa, Eimeriorina) in Amphibia: diversity, biology, molecular phylogeny and comments on the status of the genus. *Protist* 160: 123–136. [IF = 3.853]

28. **KAŠIČKOVÁ D.**, **SAK B.**, **KVÁČ M.**, **DITRICH O.** 2009: Sources of potentially infectious human microsporidia: molecular characterization of microsporidia isolates from exotic birds in the Czech Republic, prevalence study and importance of birds in epidemiology of the human microsporidial infections. *Veterinary Parasitology* 165: 125–130. [IF = 2.278]

29. KIŠIDAYOVÁ S., VÁRADYOVÁ Z., PRISTAŠ P., PIKNOVÁ M., NIGUTOVÁ K., PETRŽELKOVÁ K.J., PROFOUSOVÁ I., SCHOVANCOVÁ K., KAMLER J., **MODRÝ D.** 2009: Effects of high- and low-fiber diets on fecal fermentation and fecal microbial populations of captive chimpanzees. *American Journal of Primatology* 71: 548–557. [IF = 1.565]

30. **KOSTADINOVA A.** 2009: *Dicrogaster perpusilla* Looss, 1902 sensu Sarabeev & Balbuena (Digenea: Haploporidae): a note of caution. *Systematic Parasitology* 73: 141–150. [IF = 0.911]

31. **KOSTADINOVA A.**, GIBSON D.I. 2009: New records of rare derogenids (Digenea: Hemiuroidea) from Mediterranean sparids, including the description of a new species of *Magnibursatus* Naidenova, 1969 and redescription of *Derogenes adriaticus* Nikolaeva, 1966. *Systematic Parasitology* 74: 187–198. [IF = 0.911]

32. KRITSKY D.C., **MENDOZA-FRANCO E.F.**, BULLARD S.A., VIDAL-MARTÍNEZ V.M. 2009: Revision of the amphiamerican *Neotetraonchus* Bravo-Hollis, 1968 (Monogenoidea: Dactylogyridae), with a description of *N. vegrandis* n. sp. from the gill lamellae of the blue sea catfish *Ariopsis guatemalensis* (Siluriformes: Ariidae) off the Pacific Coast of Mexico. *Systematic Parasitology* 74: 1–15. [IF = 0.911]

33. **KUCHTA R.**, ČECH M., **SCHOLZ T.**, **SOLDÁNOVÁ M.**, **LEVRON C.**, **ŠKORÍKOVÁ B.** 2009: Endoparasites of European perch *Perca fluviatilis* fry: role of spatial segregation. *Diseases of Aquatic Organisms* 86: 87–91. [IF = 1.687]

34. **KUCHTA R.**, **SCHOLZ T.**, JUSTINE J.L. 2009: Two new species of *Bothriocephalus* Rudolphi, 1808 (Cestoda: Bothriocephalidea) from marine fish off Australia and New Caledonia. *Systematic Parasitology* 73: 229–238. [IF = 0.911]

35. **KUCHTA R.**, **SCHOLZ T.**, **VLČKOVÁ R.**, ŘÍHA M., WALTER T., YUNIAR A.T., PALM H.W. 2009: Revision of tapeworms (Cestoda: Bothriocephalidea) from lizardfish (Saurida: Synodontidae) from the Indo-Pacific region. *Zootaxa* 1977: 55–67. [IF = 0.891]

36. **KVÁČ M.**, **HANZLÍKOVÁ D.**, **SAK B.**, **KVĚTOŇOVÁ D.** 2009: Prevalence and age-related infection of *Cryptosporidium suis*, *C. muris* and *Cryptosporidium* pig genotype II in pigs on a farm complex in the Czech Republic. *Veterinary Parasitology* 160: 319–322. [IF = 2.278]

37. **KVÁČ M.**, **KVĚTOŇOVÁ D.**, **SAK B.**, **DITRICH O.** 2009: *Cryptosporidium* pig genotype II in immunocompetent man. *Emerging Infectious Diseases* 15: 982–983. [IF = 6.794]

38. **KVÁČ M.**, **SAK B.**, **HANZLÍKOVÁ D.**, **KOTILOVÁ J.**, **KVĚTOŇOVÁ D.** 2009: Molecular characterization of *Cryptosporidium* isolates from pigs at slaughterhouses in South Bohemia, Czech Republic. *Parasitology Research* 104: 425–428. [IF = 1.721]

39. **KVÁČ M.**, **SAK B.**, **KVĚTOŇOVÁ D.**, SECOR EW. 2009: Infectivity of gastric and intestinal *Cryptosporidium* species in immunocompetent Mongolian gerbils (*Meriones unguiculatus*). *Veterinary Parasitology* 163: 33–38. [IF = 2.278]

40. **LAI D.H.**, WANG Q.P., LI Z., **LUKEŠ J.**, LUN Z.R. 2009: Evolution of the serum resistance-associated SRA gene in African trypanosomes. *Chinese Science Bulletin* 54: 1275–1278. [IF = 0.898]

41. **LEVRON C.**, SITKO J., **SCHOLZ T.** 2009: Spermiogenesis and spermatozoon of the tapeworm *Ligula intestinalis* (Diphyllobothriidea): phylogenetic implications. *Journal of Parasitology* 95: 1–9. [IF = 1.195]

42. **LEVRON C.**, **SUCHANOVÁ E.**, PODDUBNAYA L., **OROS M.**, **SCHOLZ T.** 2009: Spermatological characters of the aspidogastrean *Aspidogaster limacoides* Diesing, 1835. *Parasitology Research* 105: 77–85. [IF = 1.721]

43. LOVY J., **KOSTKA M.**, **DYKOVÁ I.**, ARSENAULT G., **PECKOVÁ H.**, WRIGHT G. M., SPEARE D.J. 2009: Phylogeny and morphology of *Glugea hertwigi* from rainbow smelt *Osmerus mordax* found in Prince Edward Island, Canada. *Diseases of Aquatic Organisms* 86: 235–243. [IF = 1.687]

44. **LUKEŠ J.**, LEANDER B.S., KEELING P.J. 2009: Cascades of convergent evolution: the corresponding evolutionary histories of euglenozoans and dinoflagellates. *Proceedings of the National Academy of Science of the United States of America* 106 (Suppl. 1): 9963–9970. [IF = 9.432]

45. **MENDOZA-FRANCO E.F.**, **SCHOLZ T.** 2009: New dactylogyrids (Monogenea) parasitizing the gills of catfishes (Siluriformes) from the Amazon River basin in Peru. *Journal of Parasitology* 95: 865–870. [IF = 1.195]

46. **MENDOZA-FRANCO E.F.**, VIOLANTE-GONZÁLEZ J., ROCHE D.G. 2009: Interoceanic occurrence of species of *Aristocleidus* Mueller, 1936 (Monogenoidea: Dactylogyridae) parasitizing the gills of gerreid fishes in the Neotropics. *Parasitology Research* 105: 703–708. [IF = 1.721]

47. **MENDOZA-PALMERO C.A.**, SERENO-URIBE A.L., SALGADO-MALDONADO G. 2009: Two new species of *Gyrodactylus* von Nordmann, 1832 (Monogenea: Gyrodactylidae) parasitizing *Girardinichthys multiradiatus* (Cyprinodontiformes: Goodeidae), an endemic freshwater fish from central Mexico. *Journal of Parasitology* 95: 315–318. [IF = 1.195]

48. MIHALCA A.D., **JIRKŮ M.**, MALONZA P.K., **MODRÝ D.** 2009: A new species of *Isospora* Schneider, 1881 (Apicomplexa: Eimeriidae) in Ruppell's agama *Agama rueppelli* (Vaillant) (Sauria: Agamidae) from East Africa, with a review of this genus in agamid lizards. *Systematic Parasitology* 74: 219–223. [IF = 0.911]

49. **MODRÝ D.**, PETRŽELKOVÁ K.J., POMAJBÍKOVÁ K., TOKIWA T., KŘÍŽEK J., IMAI S., VALLO P., PROFOUSOVÁ I., ŠLAPETA J. 2009: The occurrence and ape-to-ape transmission of the entodiniomorphid ciliate *Troglodytella abrassarti* in captive gorillas. *Journal of Eukaryotic Microbiology* 56: 83–87. [IF = 2.355]

50. **MORAVEC F.** 2009: Experimental studies on the development of *Contracaecum rudolphii* (Nematoda: Anisakidae) in copepod and fish paratenic hosts. *Folia Parasitologica* 56: 185–193. [IF = 1.266]

51. **MORAVEC F.** 2009: Surface morphology of *Nicolla skrjabini* (Trematoda: Opecoelidae), a common parasite of European freshwater fishes, as revealed by SEM. *Parasitology Research* 105: 577–578. [IF = 1.721]

52. **MORAVEC F.**, CHARO-KARISA H., **JIRKŮ M.** 2009: Philometrids (Nematoda: Philometridae) from fishes of Lake Turkana, Kenya, including two new species of *Philometra* and erection of *Afrophilometra* gen. n. *Folia Parasitologica* 56: 41–54. [IF = 1.266]

53. **MORAVEC F.**, DE BURON I. 2009: New data on three gonad-infecting species of *Philometra* (Nematoda, Philometridae) from estuarine fishes in South Carolina, USA. *Acta Parasitologica* 54: 244–252. [IF = 1.070]

54. **MORAVEC F.**, DE BURON I. 2009: Two new species of philometrids (Nematoda: Philometridae) from marine fishes off South Carolina. *Journal of Parasitology* 95: 722–727. [IF = 1,195]

55. **MORAVEC F.**, **DYKOVÁ I.**, DE BURON I. 2009: Female morphology of *Philometra rubra* (Nematoda: Philometridae), a parasite of the abdominal cavity of the striped sea-bass *Morone saxatilis* (Moronidae, Perciformes) in the USA. *Folia Parasitologica* 56: 64–66. [IF = 1.266]

56. **MORAVEC F.**, **JIRKŮ M.**, CHARO-KARISA H., MAŠOVÁ Š. 2009: *Mexiconema africanum* sp. n. (Nematoda: Daniconematidae) from the catfish *Auchenoglanis occidentalis* from Lake Turkana, Kenya. *Parasitology Research* 105: 1047–1052. [IF = 1.721]

57. **MORAVEC F.**, JUSTINE J.-L. 2009: New data on dracunculoid nematodes from fishes off New Caledonia, including four new species of *Philometra* (Philometridae) and *Ichthyofilaria* (Guyanemidae). *Folia Parasitologica* 56: 129–142. [IF = 1.266]

58. **MORAVEC F.**, JUSTINE J.-L. 2009: Two cystidicolids (Nematoda, Cystidicolidae) from marine fishes off New Caledonia. *Acta Parasitologica* 54: 341–349. [IF = 1.070]

59. **MORAVEC F.**, KLIMPEL S. 2009: Two new species of cystidicolid nematodes from the digestive tract of the deep-sea fish *Coryphaenoides mediterraneus* (Giglioli) (Macrouridae) from the Mid-Atlantic Ridge. *Systematic Parasitology* 73: 37–47. [IF = 0.911]

60. **MORAVEC F.**, MUZZALL P.M. 2009: New species of *Freitascapillaria* (Nematoda: Capillariidae) from the intestine of *Cottus caeruleomentum* (Teleostei: Cottidae) in Maryland. *Journal of Parasitology* 95: 987–990. [IF = 1.195]

61. **MORAVEC F.**, SALGADO-MALDONADO G., CASPETA-MANDUJANO J.M., GONZÁLEZ-SOLÍS D. 2009: Redescription of *Spinitectus tabascoensis* (Nematoda: Cystidicolidae) from fishes of the Lacandon rain forest in Chiapas, southern Mexico, with remarks on *Spinitectus macrospinosus* and *S. osorioi*. *Folia Parasitologica* 56: 305–312. [IF = 1.266]

62. **MORAVEC F.**, SANTOS C.P. 2009: *Dracunculus brasiliensis* sp. n. (Nematoda: Dracunculidae) from the anaconda, *Eunectes murinus* (Ophidia: Boidae). *Parasitology Research* 104: 589–592. [IF = 1.721]

63. **MORAVEC F.**, SANTOS C.P. 2009: Larval *Pseudoproleptus* sp. (Nematoda: Cystidicolidae) found in the Amazon river prawn *Macrobrachium amazonicum* (Decapoda: Palaemonidae) in Brazil. *Journal of Parasitology* 95: 634–638. [IF = 1.195]

64. **MORAVEC F.**, SARAIVA A., ABDULLAH S.M.A., BILAL S.J., RAHEMO Z.I.F. 2009: Two species of *Rhabdochona* Railliet, 1916 (Nematoda: Rhabdochonidae) parasitising cyprinid fishes in Iraq, with a redescription of *R. tigridis* Rahemo, 1978 (emend.). *Systematic Parasitology* 74: 125–135. [IF = 0.911]

65. NEČAS P., SINDACO R., KOŘENÝ L., KOPEČNÁ J., MALONZA P.K., **MODRÝ D.** 2009: *Kinyongia asheorum* sp. n., a new montane chameleon from the Nyiro Range, northern Kenya (Squamata: Chamaeleonidae). *Zootaxa* 2028: 41–50. [IF = 0.891]

66. **NOVÁKOVÁ E.**, **HYPŠA V.**, MORAN N. 2009: *Arsenophonus*, an emerging clade of intracellular symbionts with a broad host distribution. *BMC Microbiology* 9 (143): 1–14. [IF = 2.890]

67. **OBORNÍK M.**, **JANOUŠKOVEC J.**, **CHRUDIMSKÝ T.**, **LUKEŠ J.** 2009: Evolution of the apicoplast and its hosts: from heterotrophy to autotrophy and back again. *International Journal for Parasitology* 39: 1–12. [IF = 3.819]

68. **ONDRÁČKOVÁ Z.**, **KVÁČ M.**, **SAK B.**, **KVĚTOŇOVÁ D.**, ROST M. 2009: Prevalence and molecular characterization of *Cryptosporidium* spp. in dairy cattle in South Bohemia, the Czech Republic. *Veterinary Parasitology* 165: 141–144. [IF = 2.278

69. **OROS M.**, HANZELOVÁ V. 2009: Re-establishment of the fish parasite fauna in the Tisa River system (Slovakia) after a catastrophic pollution event. *Parasitology Research* 104: 1497–1506. [IF = 1.721]

70. **OROS M.**, HANZELOVÁ V., **SCHOLZ T.** 2009. Tapeworm *Khawia sinensis*: review of the introduction and subsequent decline of a pathogen of carp, *Cyprinus carpio*. *Veterinary Parasitology* 164: 217–222. [IF = 2.278]

71. OVAT A., MUINDI F., FAGAN C., BROUNER M., HANSELL E., DVOŘÁK J., **SOJKA D.**, **KOPÁČEK P.**, MCKERROW J.H., CAFFREY C.R., POWERS J.C. 2009: Aza-peptidyl Michael acceptor and epoxide inhibitors-potent and selective inhibitors of *Schistosoma mansoni* and *Ixodes ricinus* legumains (asparaginyl endopeptidases). *Journal of Medicinal Chemistry* 52: 7192–7210. [IF = 4.802]

72. **PAKANDL M.** 2009: Coccidia of rabbit: a review. *Folia Parasitologica* 56: 153–166. [IF = 1.266]

73. PANIGRAHI A.K., OGATA Y., **ZÍKOVÁ A.**, ANUPAMA A., DALLEY R.A., ACESTOR N., MYLER P.J., STUART K.D. 2009: A comprehensive analysis of *Trypanosoma brucei* mitochondrial proteome. *Proteomics* 9: 434–450. [IF = 4.426]

74. PANKOV P., GIBSON D.I., **KOSTADINOVA A.** 2009: The translocated *Liza haematocheila* (Teleostei: Mugilidae) as a new host of four species of *Saturnius* Manter, 1969 (Digenea: Hemiuridae) within its invasive range in the Black Sea. *Systematic Parasitology* 74: 29–39. [IF = 0.911]

75. **PARIS Z.**, RUBIO M.A.T., **LUKEŠ J.**, ALFONZO J.D. 2009: Mitochondrial tRNA import in *Trypanosoma brucei* is independent of thiolation and the Rieske protein. *RNA* 15: 1398–1406. [IF = 5.198]

76. PODDUBNAYA L.G., **KUCHTA R.**, **LEVRON C.**, GIBSON D.I., **SCHOLZ T.** 2009: The unique ultrastructure of the uterus of the Gyrocotylidea (Cestoda) and its phylogenetic implication. *Systematic Parasitology* 74: 81–93. [IF = 0.911]

77. PŠENIČKA M., **VANCOVÁ M.**, KOUBEK P., TĚŠITEL J., LINHART O. 2009: Fine structure and morphology of sterlet (*Acipenser ruthenus* L. 1758) spermatozoa and acrosin localization. *Animal Reproduction Science* 111: 3–16. [IF = 1.563]

78. **RUDENKO N.**, **GOLOVCHENKO M.**, **RŮŽEK D.**, PISKUNOVÁ N., MALLÁTOVÁ N., **GRUBHOFFER L.** 2009: Molecular detection of *Borrelia bissettii* DNA in serum samples from patients in the Czech Republic with suspected borreliosis. *FEMS Microbiology Letters* 292: 274–281. [IF = 2.199]

79. **RUDENKO N.**, **GOLOVCHENKO M.**, **GRUBHOFFER L.**, OLIVER J.H. Jr. 2009: *Borrelia carolinensis* sp. nov. – a new (14th) member of *Borrelia burgdorferi* sensu lato complex from the southeastern United States. *Journal of Clinical Microbiology* 47: 134–141. [IF = 4.162]

80. **RUDENKO N.**, **GOLOVCHENKO M.**, LIN T., GAO L., **GRUBHOFFER L.**, OLIVER J.H. Jr. 2009: Delineation of a new species of the *Borrelia burgdorferi* sensu lato complex, *Borrelia americana* sp. nov. *Journal of Clinical Microbiology* 47: 3875–3880. [IF = 4.162]

81. **RŮŽEK D.**, **SALÁT J.**, PALUS M., GRITSUN, T. S., GOULD E. A., **DYKOVÁ I.**, **SKALLOVÁ A.**, **JELÍNEK J.**, **KOPECKÝ J.**, **GRUBHOFFER L.** 2009: CD8+ T-cells mediate immunopathology in tick-borne encephalitis. *Virology* 384: 1–6. [IF = 3.042]

82. **RŮŽEK D.**, **VANCOVÁ M.**, **TESAŘOVÁ M.**, AHANTARING A., **KOPECKÝ J.**, **GRUBHOFFER L.** 2009: Morphological changes in human neural cells following tick-borne encephalitis virus infection. *Journal of General Virology* 90: 1649–1658. [IF = 3.260]

83. SANTOS C.P., **MORAVEC F.** 2009*: Camallanus tridentatus* (Drasche) (Nematoda: Camallanidae): new taxonomically important morphological data. *Memorias do Instituto Oswaldo Cruz, Rio de Janeiro* 104: 93–99. [IF = 2.097]

84. SANTOS C.P., **MORAVEC F.** 2009: *Goezia spinulosa* (Nematoda: Raphidascarididae), a pathogenic parasite of the arapaima *Arapaima gigas* (Osteichthyes). *Folia Parasitologica* 56: 55–63. [IF = 1.266]

85. SANTOS C.P., **MORAVEC F.** 2009: Tissue-dwelling philometrid nematodes of the fish *Arapaima gigas* in Brazil. *Journal of Helminthology* 83: 295–301. [IF = 0.863]

86. **SCHOLZ T.**, DE CHAMBRIER A., BELETEW M., MAHMOUD Z.N. 2009: Redescription of *Proteocephalus glanduligerus* (Cestoda: Proteocephalidea), a parasite of clariid catfishes in Africa with a unique glandular apical organ. *Journal of Parasitology* 95: 443–449. [IF = 1.195]

87. **SCHOLZ T.**, GARCÍA H.H., **KUCHTA R.**, WICHT B. 2009: Update on the human broad tapeworm (genus *Diphyllobothrium*), including clinical relevance. *Clinical Microbiology Reviews* 22: 146–160. [IF = 14.691]

88. **ŠTEFKA J.**, **HYPŠA V.**, **SCHOLZ T.** 2009: Interplay of host specificity and biogeography in the population structure of a cosmopolitan endoparasite: microsatellite study of *Ligula intestinalis* (Cestoda). *Molecular Ecology* 18: 1187–1206. [IF = 5.960]

89. SVOBODOVÁ Z., KOLÁŘOVÁ J., **DYKOVÁ I.**, HAMÁČKOVÁ J., KOUŘIL J. 2009: Infection by *Capriniana piscium* (Buetschli, 1889) Jankovski, 1973, a cause of rainbow trout (*Oncorhynchus mykiss*) kill. *Bulletin of the European Association of Fish Pathologists* 29: 92–97. [IF = 0.513]

90. SYCHROVSKÝ V., **FOLDYNOVÁ-TRANTÍRKOVÁ S.**, ŠPAČKOVÁ N., ROBEYNS K., VAN MEERVELT L., BLANKENFELDT W., VOKÁČOVÁ Z., SPONER J., **TRANTÍREK L.** 2009: Revisiting the planarity of nucleic acid bases: pyramidilization at glycosidic nitrogen in purine bases is modulated by orientation of glycosidic torion. *Nucleic Acids Research* 37: 1–11. [IF = 7.479]

91. ŠIROKÝ P., MIKULÍČEK P., JANDZÍK D., KAMI H., MIHALCA A.D., ROUAG R., KAMLER M., SCHNEIDER C., ZÁRUBA M., **MODRÝ D.** 2009: Co-distribution pattern of a haemogregarine *Hemolivia mauritanica* (Apicomplexa: Haemogregarinidae) and its vector *Hyalomma aegyptium* (Metastigmata: Ixodidae). *Journal of Parasitology* 95: 728–733. [IF = 1.195]

92. TERNENGO S., **LEVRON C.**, MOUILLOT D., MARCHAND B. 2009: Site influence in parasite distribution from fishes of the Bonifacio Strait Marine Reserve (Corsica Island, Mediterranean Sea). *Parasitology Research* 104: 1279–1287. [IF = 1.721]

93. VALIGUROVÁ A., MICHÁLKOVÁ V., **KOUDELA B.** 2009: Eugregarine trophozoite detachment from the host epithelium via epimerite retraction: fiction or fact? *International Journal for Parasitology* 39: 1235–1242. [IF = 3.819]

94. **VOTÝPKA J.**, LANTOVÁ L., GHOSH K., BRAIG H. R., VOLF P. 2009: Molecular characterization of gregarines from sand flies (Diptera: Psychodidae) and description of *Psychodiella* n. g. (Apicomplexa: Gregarinida). *Journal of Eukaryotic Microbiology* 56: 583–588. [IF = 2.355]

95. **VOTÝPKA J.**, SYNEK P., SVOBODOVÁ M. 2009: Endophagy of biting midges attacking cavity-nesting birds. *Medical and Veterinary Entomology* 23: 277–280. [IF = 2.092]

96. WOHLGAMUTH-BENEDUM J.M., RUBIO M.A.T., **PARIS Z.**, **LONG S.**, **POLIAK P.**, **LUKEŠ J.**, ALFONZO J.D. 2009: Thiolation controls cytoplasmic tRNA stability and acts as a negative determinant for tRNA editing in mitochondria. *Journal of Biological Chemistry* 284: 23947–23953. [IF = 5.328]

97. XI B.W., **OROS M.**, WANG G.T., WU S.G., GAO D., NIE P. 2009: *Khawia saurogobii* n. sp. (Cestoda: Caryophyllidea) from freshwater fish *Saurogobio* spp. (Cyprinidae) in China. *Journal of Parasitology* 95: 1516–1519. [IF = 1.195]

98. YURCHENKO V.Y., **LUKEŠ J.**, **JIRKŮ M.**, MASLOV D.A. 2009: Selective recovery of the cultivation-prone components from mixed trypanosomatid infections: a case of several novel species isolated from Neotropical Heteroptera. *International Journal of Systematic and Evolutionary Microbiology* 59: 893–909. [IF = 2.113]

99. **ZÍKOVÁ A.**, SCHNAUFER A., DALLEY A.R., PANIGRAHI K.A., STUART D.K. 2009: The FoF1-ATP synthase complex contains novel subunits and is essential for procyclic *Trypanosoma brucei*. *PLoS Pathogens* 5: e1000436. [IF = 8.978]

International activities

Cooperation with foreign research institutions

Research area: Parasites of fish

- College of Charleston, Department of Biology, Charleston, USA (I. de Buron)
- Instituto de Investigaciones Marinas, Vigo, Spain (A. Figueras)
- ECOSUR, Chetumal, Mexico (D. González-Solís)
- Institut de Recherche pour le Développement, Nouméa, New Caledonia (J.-L. Justine)
- Institute for Biology of Inland Waters, Russian Academy of Sciences, Borok, Russia (L.G. Poddubnaya)
- Institute of Marine Research, Bergen, Norway (F. Nilsen)
- Instituto do Oswaldo Cruz, Rio de Janeiro, Brazil (A. Kohn, C.P. Santos)
- Murdoch University, Murdoch, Australia (R.P. Hobbs)
- Muséum d'Histoire Naturelle, Genève, Switzerland (A. de Chambrier)
- Parasitological Institute, Slovak Academy of Sciences, Košice, Slovakia (V. Hanzelová)
- The Natural History Museum, London, UK (P.D. Olson, R.A. Bray, D.I. Gibson, D.T.J. Littlewood)
- Universidad Nacional Autónoma de México, Instituto de Biología, Mexico (G. Salgado-Maldonado)
- Universitet de Barcelona, Facultat de Farmacia, Barcelona, Spain (J. Miquel)
- University of Bristol, School of Biological Sciences, UK (W. Gibson)
- University of Cape Town, Department of Zoology, Rondebosch, South Africa (C.C. Reed)
- University of Connecticut, Storrs, USA (J.N. Caira)
- University of Corsica & CNRS, Corte, France (S. Ternengo)
- University of the Free State, Bloemfontein, South Africa (J. Van As, L. Basson)
- University of Jyväskylä, Jyväskylä, Finland (E.T. Valtonen)
- University of Helsinki, Helsinki, Finland (M. Pekkarinen)
- University of Queensland, Brisbane, Australia (W.K. Kay)
- University of Tasmania, School of Aquaculture, Launceston, Tasmania, Australia (B. Nowak)

Research area: Parasitic protists of man and animals with special reference to opportunistic parasites

- CDC, Division of Parasitic Diseases, Atlanta, USA (L. Xiao, V. Cama, E.W. Secor)
- Vet & Micro Science, North Dakota State University, Fargo, USA (J. McEvoy)
- Wroclaw Medical University, Wrocław, Poland (M. Wesolowska)

Research areas: Molecular biology of parasitic protists and nematodes & Molecular taxonomy and phylogeny of parasites

- CNRS UMR8186, Ecole Normale Supérieure, Paris, France (C. Bowler)
- Comenius University, Faculty of Science, Bratislava, Slovakia (A. Horváth)
- Kansas State University, Manhattan, KS, USA (M. Herman)
- Seattle Biomedical Research Institute and University of Washington, Seattle, USA (K. Stuart)
- The Ohio State University, Columbus, USA (J. Alfonzo)
- University of British Columbia, Vancouver, Canada (P.J. Keeling, B.R. Green)

- University of California, Riverside (D.A. Maslov)
- University of Edinburgh, Institute of Immunology and Infectious Research, UK (A. Schnaufer)
- University of Montreal, Department of Biochemistry, Québec, Canada (G. Burger)
- University of Tsukuba, Japan (R. Niwa)
- University of Lancaster, Lancaster, U.K. (M.L. Ginger)
- Walter and Eliza Hall Institute of Medical Research, Melbourne (E. Handman)

Research area: Biology of disease vectors

- Baxter Innovations GmbH, Orth/Danube, Bacteriology and Preclinical Testing (I. Livey)
- Catholic University Leuven, Rega Institute for Medical Research, Belgium (E. De Clercq)
- CEH Institute of Virology and Environmental Microbiology, Oxford, UK (P.A. Nuttall, G. Paesen)
- Centers for Disease Control and Prevention, Fort Collins, USA (N. Zeidner)
- Georgia Southern University, Institute of Parasitology and Arthropodology (J.H. Oliver, Jr.)
- Indiana University, National Centre of Glycomics and Glycoproteomics, USA (M.V. Novotný)
- Institute of Virology, Slovak Academy of Sciences, Bratislava, Slovakia (V. Hajnická)
- Institute of Zoology, Slovak Academy of Sciences, Bratislava, Slovakia (M. Labuda, M. Kazimírová, M. Stanko)
- Kagoshima University, Japan (K. Fujisaki)
- Muhlenberg College, Allentown, USA (M.J. Edwards)
- National Institute of Health, Washington, DC, USA (J. Valenzuela, J. Anderson, J. Ribeiro)
- NRC Institute for Biological Sciences, Ottawa, Canada (R. Mackenzie, J.-R. Brisson, S. Logan)
- Parasitological Institute, Slovak Academy of Sciences, Košice, Slovakia (B. Peťko, M. Derdáková)
- State University of New York, Department of Medicine, Stony Brook, USA (B.J. Luft)
- University of Aberdeen, Aberdeen, UK (A. Bowman)
- University of Arizona, Tucson, Centre for Insect Science, USA (J.H. Law, R. Miesfeld, C. Bender)
- University of California, Sandler Center for Basic Research in Parasitic Diseases, San Francisco (C.R. Caffrey, J.H. McKerrow)
- University of Edinburgh, Edinburgh, UK (L. Sekey-Bell)
- University of Glasgow, Glasgow, UK (R. Smith, H. de Koning, John Gilleard, A. Tait)
- University of Liège, Faculty of Veterinary Medicine, Belgium (A. Vanderplasschen)
- University of Neuchâtel (B. Betchart, P. Guerin, L. Gern)
- University of Reading, UK (E. Gould, T. Gritsun)
- University of Utrecht, The Netherlands (F. Jongejan)

Membership in international organisations

Masako Asahina-Jindrová

- Member of the American Society for Cell Biology
- Member of the Genetics Society of America

Iva Dyková

- Regional Officer of the European Association of Fish Pathologists

Maryna Golovchenko

- Adjunct member of the James Oliver, Jr. Institute of Arthropodology and Parasitology at the Georgia Southern University

Libor Grubhoffer

- Member of the Organizing Committee for the EMBO Workshops on the Molecular and Population Biology of Mosquito and other Disease Vectors
- Adjunct member of the James Oliver, Jr. Institute of Arthropodology and Parasitology at the Georgia Southern University

Jiří Lom

- Elected Honorary Member of the European Association of Fish Pathologists
- Member of the Honorary Members Committee of the Society of Protozoologists

Julius Lukeš

- President of the International Society for Evolutionary Protistology
- Vice President of the International Society of Protistologists
- Associate of the Canadian Institute for Advanced Research

František Moravec

- Honorary Member of the Society of Slovak Parasitologists

Miroslav Oborník

- Member of the International Society for Evolutionary Protistology

Nataliia Rudenko

- Adjunct member of the James Oliver, Jr. Institute of Arthropodology and Parasitology at the Georgia Southern University

Tomáš Scholz

- Corresponding member of the Natural History Museum, Geneva, Switzerland

Jiří Vávra

- International Society of Protistologists

Membership on editorial boards

Acta Parasitologica (Poland): ***F. Moravec***, ***T. Scholz***
Acta Protozoologica (Poland): ***J. Vávra***
European Journal of Protistology (Germany): ***J. Lom***
Helminthologia (Slovakia): ***F. Moravec***
Journal of Eukaryotic Microbiology (USA): ***J. Lukeš***, ***J. Vávra*** (board of reviewers)
Journal of Fish Diseases (UK): ***J. Lom***
Journal of Parasitology (USA): ***T. Scholz*** (Assistant Editor)
Kinetoplastid Biology and Disease (UK): ***J. Lukeš***
Korean Journal of Parasitology (Korea): ***T. Scholz***
Protistology (Russia): ***J. Lukeš***
Systematic Parasitology (UK): ***F. Moravec***
Wiadomości Parazytologyczne (Poland): ***T. Scholz***
Folia Parasitologica (Czech Republic):
- ***V. Bukva*** (Editor-in-Chief)
- ***L. Grubhoffer*** (Assistant Editor)
- ***L. Lom*** (Assistant Editor)
- ***F. Moravec*** (Assistant Editor)
- ***I. Dyková***
- ***T. Scholz***

Teaching activities

The mission of the Institute of Parasitology is primarily to perform basic research. However, participation of the staff in teaching is an integral part of its activities. In addition, teaching is essential for further development of the Institute. Therefore, most of the key scientists participate in teaching, both by giving lectures and supervising graduate and undergraduate students.

The students actively participate in research projects of the Institute. Most students are from the University of South Bohemia in České Budějovice, especially its Faculty of Science, but also from other universities, such as Charles University in Prague, Masaryk University in Brno and the University of Veterinary and Pharmaceutical Sciences in Brno.

In order to facilitate scientific cooperation and participation of students in the research performed at the Institute, the Laboratory of Molecular Biology of Vectors and Pathogens (head L. Grubhoffer) has been established jointly with the University of South Bohemia. This laboratory has been supported by the Institutional Research Project of the Faculty of Science (MSM 6007665801).

List of Ph.D. theses

2008

- **Jan Štefka**: Host specificity, genetic variability and genealogy in populations of model parasite species
  Supervisors: ***Václav Hypša*** and ***Tomáš Scholz***
- **Daniel Růžek**: Molecular aspects of epidemiology and pathogenesis of tick-borne encephalitis
  Supervisor: ***Libor Grubhoffer***

2009

- **Veronika Burešová**: Function of the α_2-macroglobulin protein family in the immune response of the tick *Ixodes ricinus*
  Supervisor: ***Petr Kopáček***
- **Kateřina Černá**: Tick saliva-activated transmission of *Borrelia burgdorferi*
  Supervisor: ***Jan Kopecký***
- **Ondřej Hajdušek**: Functional analysis of metabolic and immune proteins in the tick *Ixodes ricinus* by RNA interference
  Supervisors: ***Libor Grubhoffer*** and ***Petr Kopáček***
- **Martina Hajdušková**: Functional analysis of the nuclear receptor NHR-25 during *Caenorhabditis elegans* development
  Supervisors: ***Masako Asahina-Jindrová*** and ***Marek Jindra*** (Institute of Entomology)
- **Hassan Hashimi**: Aspects of RNA editing in *Trypanosoma brucei*
  Supervisor: ***Julius Lukeš***
- **Kateřina Jiroutová**: The origin and localization of selected metabolic pathways in marine diatoms
  Supervisor: ***Miroslav Oborník***
- **Shaojun Long**: Iron-sulfur cluster assembly in *Trypanosoma brucei*
  Supervisor: ***Julius Lukeš***
- **Anna Skallová**: Interactions among *Ixodes ricinus* tick saliva, murine dendritic cells and the tick-borne encephalitis virus
  Supervisor: ***Jan Kopecký***

List of Mgr. theses

2008

- **Jan Janouškovec**: The plastid of RM12, the photosynthetic ancestor of Apicomplexa
  Supervisor: ***Miroslav Oborník***
- **Alena Jelínková**: Study of endogenous development the rabbit coccidium *Eimeria exigua*
  Supervisor: ***Michal Pakandl***
- **Eva Nováková**: *Arsenophonus*, an emerging clade of intracellular symbionts with a broad host distribution
  Supervisor: ***Václav Hypša***
- **Romana Vlčková**: Taxonomic revision of tapeworms from genera *Oncodiscus*, *Tetrapapillocephalus* and *Bothriocephalus* (Bothricephalidae) from lizardfishes of the genus *Saurida*
  Supervisor: ***Roman Kuchta***

2009

- **Lenka Bartošová**: Paleoparasitological analysis in organic sediments on archeological locality in Chrudim
  Supervisor: ***Oleg Ditrich***
- **Hana Bielniková**: Potential uses of the low voltage transmission electron microscope LVEM 5 for the identification of viruses
  Supervisor: ***Jana Nebesářová***
- **Tereza Cermanová**: Expression of Kunitz-type recombinant protein, potential toxin from the salivary glands of the tick *Ixodes ricinus*
  Supervisor: ***Petr Kopáček***
- **Piya Changmai**: Functional analysis of iron-sulfur cluster assembly protein Isd11 in procyclic and bloodstream *Trypanosoma brucei*
  Supervisor: ***Julius Lukeš***
- **Zdeňka Číčová**: Functional analysis of subunits of mitochondrial RNA binding complex 1 in *T. brucei*.
  Supervisors: ***Hassan Hashimi*** and ***Julius Lukeš***
- **Miroslav Fišer**: Identification and biochemical characterization of lectins in the hemolymph of three species of tick in the genus *Rhipicephalus*.
  Supervisors: ***Libor Grubhoffer*** and ***Ján Štěrba***
- **Ivana Haasová**: Tapeworms of family Gryporhynchidae from Africa
  Supervisor: ***Tomáš Scholz***
- **Petra Houfková**: Identification of interacting partners of Discs overgrown *in vivo*
  Supervisor: ***Lukáš Trantírek***
- **Dagmar Jirsová**: Phylogenetic relationships of small intestinal flukes (Digenea: Heterophyidae), with emphasis on the taxonomy of the *Ascocotyle* complex
  Supervisor: ***Tomáš Scholz***
- **Denisa Kašičková**: Microsporidial infections of exotic birds
  Supervisor: ***Oleg Ditrich***
- **Alena Kodádková**: Roles of CD4+ and CD8+ T-lymphocytes in immune response to the gastric cryptosporidiosis
  Supervisor: ***Martin Kváč***
- **Jana Martinů**: Host-parasite coevolution between the louse specie *Polyplax serrata* and its host, the mice of the genus *Apodemus*
  Supervisor: ***Jan Štefka***

- **Linda Merglová**: The regulation of transcription by the nuclear receptor NHR-25 in *Caenorhabditis elegans*
  Supervisor: ***Masako Asahina-Jindrová***
- **František Musil**: Potentials and limits of RNA interference in the tick *Ixodes ricinus*
  Supervisor: ***Petr Kopáček***
- **Zuzana Ondračková**: Prevalence and molecular characterization of *Cryptosporidium* spp. in dairy cattle in South Bohemia, Czech Republic
  Supervisor: ***Martin Kváč***
- **Helena Pěničková**: Peptidases in digestive cells in the gut of the hard tick *Ixodes ricinus* – localization and function
  Supervisor: ***Petr Kopáček***
- **Lenka Richterová**: Functional analysis of mitochondrial ribosome of *Trypanosoma brucei*
  Supervisor: ***Julius Lukeš***
- **Nina Růžičková**: Characterization of 18.7 and 19 kDa groups of secreted proteins in the salivary glands of the castor bean tick *Ixodes ricinus*
  Supervisors: ***Jan Kopecký*** and ***Jindřich Chmelař***
- **Hana Šťastná**: Changes in global gene expression in human neural cells following tick-borne encephalitis virus infection
  Supervisor: ***Daniel Růžek***
- **Karolína Šubrtová**: Immunization against proteins from tick saliva using cDNA vaccine technology
  Supervisor: ***Jan Kopecký***

List of Bc. theses

2008

- **Andrea Bednářová**: Development of cercariae (Trematoda) in the first intermediate host: current knowledge and perspectives
  Supervisor: ***Anna Faltýnková***
- **Lucie Brejchová**: Ecological and epidemiological aspects of Lyme borreliosis
  Supervisor: ***Jan Kopecký***
- **Alena Buriánová**: A comparative study of tapeworms of the genera *Polyonchobothrium*, *Senga* and *Tetracampos* (Cestoda: Bothriocephalidea) from freshwater fish of Africa and Asia
  Supervisor: ***Roman Kuchta***
- **Eva Černotíková**: Potencial usage of (S)-HPMPA in therapy of microsporidiosis
  Supervisor: ***Oleg Ditrich***
- **Veronika Dorňáková**: Ricinusin – a new antimicrobial peptide isolated from the hard tick *Ixodes ricinus*: the third member of the tick histidine-rich defense protein family
  Supervisor: ***Nataliia Rudenko***
- **Jarmila Dupejová**: Isolation and biochemical characterisation of FREP proteins from *Dermacentor marginatus*
  Supervisor: ***Libor Grubhoffer***
- **Iva Fornbaumová**: Cryptosporidial infections of pigs
  Supervisor: ***Martin Kváč***
- **Eva Gregorová**: Ecological and epidemiological aspects of tick-borne encephalitis
  Supervisor: ***Jan Kopecký***
- **Zdeňka Jankovská**: Influence of TNF-α on the development of infection *Encephalitozoon cuniculi* in murine macrophages
  Supervisor: ***Jan Kopecký***

- **Patrik Kilián**: The occurrence of the tick-borne encephalitis virus in the tick *Ixodes ricinus* in altitudes above 600 m a.s.l.
  *Supervisor: **Libor Grubhoffer***
- **Michaela Kotková**: Influence of tick saliva on cytokine IL-17 production by murine splenocytes
  *Supervisor: **Jan Kopecký***
- **Tereza Marvanová**: Genealogical structure of populations of parasitic nematode *Haemonchus contortus*
  *Supervisor: **Václav Hypša***
- **Lenka Moravcová**: *Trachipleistophora hominis, in vitro* culture
  *Supervisor: **Bohumil Sak***
- **Lucie Novotná**: Investigation of function and composition of the novel mitochondrial complex MRB1 in *Trypanosoma brucei*
  *Supervisor: **Hassan Hashimi***
- **Zuzana Papáčková**: Microsporidial infection of pigs
  *Supervisor: **Bohumil Sak***
- **Jan Perner**: Characterization of cystatin in the tick *Ixodes ricinus*
  *Supervisors: **Petr Kopáček*** and ***Lenka Grunclová***
- **Pavel Poliak**: Functional analysis of NifS1 in procyclic *Trypanosoma brucei*
  *Supervisor: **Julius Lukeš***
- **Lenka Rousková**: The role of *Daphniae* by filtration of *Cryptosporidium* in water column
  *Supervisor: **Oleg Ditrich***
- **Petra Rozkošná**: Monogenea of the cichlid fish *Cichlasoma amazonarum* from Peruvian Amazonia
  *Supervisor: **Tomáš Scholz***
- **Petr Růžička**: Preparation of constructs for overexpression and crystallisation of prohibitin complex from *T. brucei*
  *Supervisor: **Julius Lukeš***
- **Jana Smrčková**: Does the heterogeneity of ribosomal genes affect phylogenetic analyses of insect secondary symbionts?
  *Supervisor: **Václav Hypša***
- **Eva Suchanová**: Ultrastructure of the spermiogenesis and spermatozoon of the trematode *Aspidogaster limacoides* (Trematoda, Aspidogastrea)
  *Supervisor: **Céline Levron***
- **Zuzana Šimonová**: Complete genome sequence analysis of TBE virus, strain Hypr, in different passages in host *in vivo*
  *Supervisor: **Libor Grubhoffer***
- **Lenka Šípková**: Spermiogenesis and spermatozoon ultrastructure of the tapeworm *Parabothriocephalus gracilis* (Eucestoda), a parasite of the bathypelagic fish *Psenopsis anomala*
  *Supervisor: **Céline Levron***
- **Karolína Šustrová**: Cultivation of tick-borne encephalitis virus in the presence of inhibitor of glycosylation: its effect on nucleotide sequence of genes encoding viral proteins
  *Supervisor: **Libor Grubhoffer***
- **Jiří Týč**: Functional analysis of the YCF 45 gene in procyclic *Trypanosoma brucei*
  *Supervisor: **Julius Lukeš***
- **Michaela Veselíková**: Riboswitch as a versatile gene control element
  *Supervisor: **Silvie Trantírková***
- **Vendula Vetišková**: Methods of laboratory diagnostic of tick-borne encephalitis
  *Supervisor: **Libor Grubhoffer***

2009

- **Věra Chromá**: Dynamics of CD4+ and CD8+ lymphocytes in the intesine and mesenteric lymph nodes of suckling rabbits of various age infected with coccidia *Eimeria intestinalis* a *Eimeria flavescens*
  *Supervisor: **Michal Pakandl***
- **Petr Franta**: Expression of recombinant Cathepsin C / the digestive exopeptidase of the tick *Ixodes ricinus*
  *Supervisor: **Petr Kopáček***
- **Jiří Havran**: Identification and isolation gene encoding peroxiredoxin, detoxification enzyme involved in antioxidant defense of hard tick *Ixodes ricinus*
  *Supervisor: **Natalia Rudenko***
- **Marie Jalovecká**: The immune response of mice to gastric cryptosporidium infections
  *Supervisor: **Martin Kváč***
- **Lucie Jedličková**: Isolation and analysis of Salp25D gene, a homologue of glutathionperoxidase, of the hard tick *Ixodes ricinus*
  *Supervisor: **Natalia Rudenko***
- **Martina Jonáková**: Identification of glycoproteins in samples of the CB53 isolate of the spirochete *Borrelia burgdorferi* s.s.
  *Supervisor: **Ján Štěrba*** and ***Libor Grubhoffer***
- **Jitka Kociánová**: The destiny of oocysts of *Cryptosporidium* spp. in the enviroment in contact with different kinds of invertebrates
  *Supervisor: **Oleg Ditrich***
- **Kristýna Kvardová**: The study of the inhibition of tick-borne encephalitis virus-replication under *in vitro* conditions
  *Supervisor: **Daniel Růžek***
- **Ondřej Máca**: Parasitic crustaceans from Neotropical freshwater fish
  *Supervisor: **Roman Kuchta***
- **Martin Palus**: Study of the pathogenesis of tick-borne encephalitis in hosts with different genetic and immunological background
  *Supervisors: **Daniel Růžek*** and ***Libor Grubhoffer***
- **Markéta Pelikánová**: Human microsporidial infection
  *Supervisor: **Bohumil Sak***
- **Benjamín Skála**: Molecular phylogenetics of primary endosymbiots of insects
  *Supervisor: **Václav Hypša***
- **Markéta Svatáková**: The facilities of usage of immunolocalisation methods for field emission scanning electron microscopy
  *Supervisor: **Jana Nebesářová***
- **Eliška Šrámová**: Genotyping of *Giardia intestinalis* isolates
  *Supervisor: **Oleg Ditrich***
- **Kateřina Švehlová**: Riboswitch as a new molecular method of gene expression regulation at the level of mRNA in *Leishmania tarentolae*
  *Supervisor: **Silvie Trantírková***

Teaching abroad and at international courses

2008

- **Jana NEBESÁŘOVÁ**, **Marie VANCOVÁ**: The EMBO practical course on Electron Microscopy and Stereology in Cell Biology. 20–29 August 2008, České Budějovice, Czech Republic
- **Tomáš SCHOLZ**: I Curso Internacional "*Sanidad y zoonosis transmitidas por peces.*" Facultad de Veterinaria y Zootecnia, Universidad Peruana Cayetano Heredia, Lima, Peru, 25–27 September 2008

- **Tomáš SCHOLZ**: Theoretical & practical course "*Introduction to helminthology & fish parasitology.*" Faculty of Science, University of Khartoum, Sudan, 12–13 November 2008
- **Tomáš SCHOLZ**: Ph.D. defence (chairman of the committee) of Barbara Wicht, Faculté des Sciences III, Université de Genève, Switzerland, 5 November 2008

2009

- **Roman KUCHTA**: "*Parasitology.*" University of Connecticut, Department of Ecology & Evolutionary Biology, Connecticut, USA
- **Daniel RŮŽEK**: Arthropod-borne viruses, their vectors and hosts. A story of three human infections. International Summer School on Pathogen-Host Interplay. Berlin, Germany. Interdisciplinary Center for Infection Biology and Immunity, Humboldt-Universität zu Berlin. 18 July–1 August 2009.
- **Tomáš SCHOLZ**: Ph.D. defence (chairman of the committee) of María Isabel Blasco-Costa, Universidad de Valencia, Spain, 21 April 2009

Stays of foreign students

2008

- **Maxwell BARSON**: University of Harare, Zimbabwe (10 days)
  Supervisor: **Tomáš Scholz**
- **Eva BAZSALOVICSOVÁ**: Parasitological Institute, Košice, Slovakia (1 month)
  *Supervisor: **Jan Štefka***
- **Daniel BRADY**: Faculty of Biomedical & Live Sciences, University of Glasgow, UK (IBLS Work Placement; Socrates/Erasmus; 4 months)
  *Supervisor: **Oleg Ditrich***
- **Anna JANOWICZ**: University of Glasgow, Scotland, UK (IBLS Work Placement; Socrates/Erasmus; 10 months)
  *Supervisor: **Libor Grubhoffer***
- **Marianna REBLÁNOVÁ**: Parasitological Institute, Košice, Slovakia (2 weeks)
  *Supervisor: **Martina Orosová***
- **Björn SCHÄFFNER**: University of Karlsruhe, Germany (1 week)
  *Supervisor: **Tomáš Scholz***

2009

- **Sandra ANTUNES**: INETI – National Institute of Engineering Technology and Innovation, Department of Biotechnology, Lisbon, Portugal (PhD student; research stay; 2 months)
  *Supervisor: **Nataliia Rudenko***
- **Eva BAZSALOVICSOVÁ**: Parasitological Institute, Košice, Slovakia (1 month)
  *Supervisor: **Tomáš Scholz***
- **Daniel BRADY**: Faculty of Biomedical & Live Sciences, University of Glasgow, UK (6 months)
  *Supervisor: **Oleg Ditrich***
- **Rebecca BROWN**: University of Glasgow, UK (IBLS Work Placement; Socrates/Erasmus; 5 months)
  *Supervisor: **Aneta Kostadinova***
- **Stella CIENIUCH**: Medical University of Gdansk, Gdynia (PhD student; research stay; Socrates/Erasmus; 6 months)
  *Supervisors: **Nataliia Rudenko*** and ***Libor Grubhoffer***
- **Mirabela DUMITRACHE**: Faculty of Veterinary Medicine, Cluj-Napoca, Romania
  *Supervisor: **Libor Grubhoffer***
- **Ashlie HARTIGAN**: University of Sydney, Australia (6 weeks)
  *Supervisor: **Iva Dyková***

- **Shijia LUN**: University of British Columbia, Vancouver, Canada (4.5 months)
  *Supervisor: **Julius Lukeš***
- **Marianna REBLÁNOVÁ**: Parasitological Institute, Košice, Slovakia (2 weeks)
  *Supervisor: **Martina Orosová***
- **Daniele Fernanda ROSIM**: Universidade Federal Rural do Rio de Janeiro, Brazil (2 months)
  *Supervisor: **Tomáš Scholz***
- **Björn SCHÄFFNER**: University of Karlsruhe, Germany (6 months – MSc project)
  *Supervisor: **Tomáš Scholz***

Stays of foreign researchers

2008

- **Mehdi ALIYEV**: National Academy of Science, Institute of Zoology, Baku, Azerbaijan
- **Arunee AHANTARIG**: Mahidol University Bangkok, Thailand
- **Magdaléna BRUŇANSKÁ**: Parasitological Institute SAV, Košice, Slovensko
- **Vitaliano Antonio CAMA**: CDC, Division of Parasitic Diseases, Atlanta, USA
- **Alain de CHAMBRIER**: Muséum d'histoire naturelle, Genève, Switzerland
- **David GONZÁLEZ-SOLÍS**: ECOSUR, Chetumal, Mexico
- **Jan LOVY**: University of Prince Edward Island, Canada
- **Frank MUTSCHMANN**: Berlin, Germany
- **Yulia PODLIPAEVA**: Zoological Institute, St. Petersburg, Russia
- **Larisa G. PODDUBNAYA**: Institut of Biology of Inland Waters, Borok, Russia
- **Claudia Portes SANTOS**: FIOCRUZ, Rio de Janeiro, Brazil
- **Katarína TRNKOVÁ**, **Lucia MADAROVÁ**: Regional Authority of Public Health, Banská Bystrica, Slovensko
- **Anastasios D. TSAOUSIS**: Dalhousie University, Halifax, Canada
- **Lihua XIAO**: CDC, Division of Parasitic Diseases, Atlanta, USA
- **Neil YOUNG**: University of Tasmania, Launceston, Australia

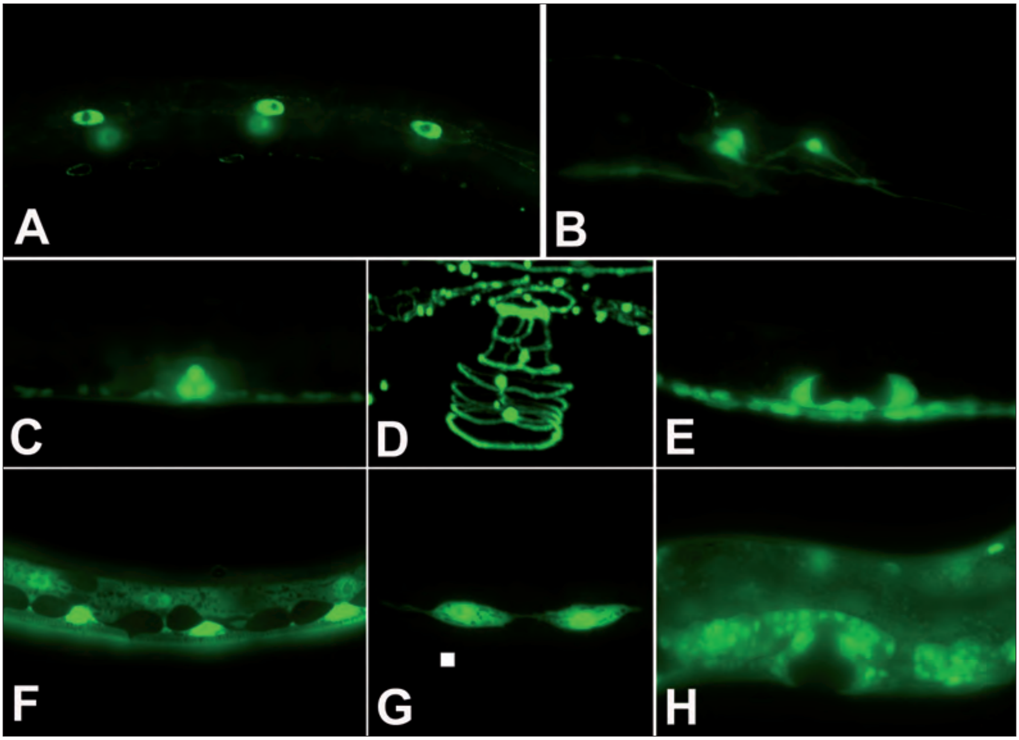
2009

- **Janneke BALK**: University of Cambridge, UK
- **Tran Thin BINH**: Institute of Ecology and Biological Resources, Hanoi, Vietnam
- **María Isabel BLASCO-COSTA**: Universidad de Valencia, Spain
- **Esteban BONTEMPI**: University of Buenos Aires, Argentina
- **Chris BOWLER**: Ecole nationale supérieure, Paris, France
- **Magdaléna BRUŇANSKÁ**: Parasitological Institute, Košice, Slovakia
- **Alain de CHAMBRIER**: Muséum d'histoire naturelle, Genève, Switzwrland
- **Pavel** and **Olga FLEGONTOV**: Moscow State University, Russia
- **Kózo FUJISAKI**: Kagoshima University, Japan
- **Helke HILLEBRAND**: EMBL, Heidelberg, Germany
- **Elena A. LEVASHINA**: Institute of Cellular Biology, Strassbourg, France
- **Zhaorong LUN**: University of Guangzhou, China
- **John Odoyo MALALA** and **Kenneth Erick OUMA WERIMO**: Kenya Marine and Fisheries Research Institute
- **Edgar F. MENDOZA-FRANCO**: CINVESTAV-IPN Mérida, Mexico
- **Kazuya NAGASAWA**: University of Hiroshima, Japan
- **Zuzana VASILKOVÁ**: Parasitological Institute, Košice, Slovakia
- **Maria WESOLOWSKA**: Wroclaw Medical University, Wrocław, Poland
- **Barbara WICHT**: Istituto Cantonale di Microbiologia, Bellinzona, Switzerland
- **Chris WILLIAMS**: Environment Agency, Brampton, UK

Survey of lectures and courses (2008–2009) (hours/year)[1]

Name	Course	2008	2009
M. Asahina-Jindrová	Developmental Biology	10	7
M. Asahina-Jindrová	Intercellular signaling in development and disease	-	45[3]
M. Asahina-Jindrová	Methods of molecular biology	48	48
M. Asahina-Jindrová	Regulation and cell signaling	4	4
O. Ditrich	Medical parasitology and diagnostic methods I	85	-
O. Ditrich	Medical parasitology and diagnostic methods II	-	85
O. Ditrich	Biology of molluscs	52	-
O. Ditrich	Special zoology of invertebrates	8	8
O. Ditrich	Parasitology	26[2]	26[2]
I. Dyková	Pathology of parasitic diseases	-	32[3]
I. Dyková	Laboratory techniques in biology	16	16
L. Grubhoffer	Biochemistry	60	60
L. Grubhoffer	Biochemistry 1 (CB + Linz)	65	65
L. Grubhoffer	Biochemistry 2 (CB + Linz)	-	45
H. Hashimi	Cell regulation and signalling	-	39
S. Hucek	Electron microscopy and microanalysis	24[4]	24[4]
V. Hypša	Biology of parasitism	26	26
V. Hypša	Biology of marine invertebrates	26	26
V. Hypša	Molecular phylogenetics	26	26
V. Hypša	Biology of parasitic arthropods	-	39
J. Kopecký	Immunology	40	40
J. Kopecký	Parasite immunology	20	20
J. Kopecký	Cell and tissue cultures	20	20
J. Kopecký	Parasite immunology	-	10[5]
B. Koudela	Biology of parasitic protozoa	-	80[3]
R. Kuchta	Special zoology of invertebrates	-	10
M. Kváč	Zoohygiene and prevention of diseases of farm animals	28[6]	28[6]
M. Kváč	Veterinary medicine	4[6]	4[6]
M. Kváč	Animal health	56[6]	56[6]
M. Kváč	Veterinary parasitology	42[6]	42[6]
J. Lukeš	Biology of parasitic protists	-	80
J. Lukeš	Biochemistry and molecular biology of parasites	30	-
J. Nebesářová	Electron microscopy for biologists I	96	96
J. Nebesářová	Electron microscopy	36[2]	36[2]
M. Oborník	Bioinformatics	-	24
M. Oborník	Molecular taxonomy	-	56[6]
D. Růžek	Medical virology	48	-
B. Sak	Cell biology methods	28[2]	28[2]
J. Salát	Parasite immunology	20[3]	-
T. Scholz	Biology of parasitic helminths	78	-
T. Scholz	Special zoology of invertebrates	-	3
J. Vávra	Biology of parasitic protists	-	39
J. Vávra	Biology of parasitic protists	-	9[5]

[1] Faculty of Science, University of South Bohemia, České Budějovice, unless otherwise stated
[2] Faculty of Health and Social Studies, University of South Bohemia, České Budějovice
[3] Faculty of Science, Masaryk University, Brno
[4] Faculty of Education, University of South Bohemia, České Budějovice
[5] Faculty of Science, Charles University, Prague
[6] Faculty of Agriculture, University of South Bohemia, České Budějovice
(CB+Linz) crossborder curriculum of Biological Chemistry (Univ. of South Bohemia & Johanes Kepler Univ. in Linz)



Celebrity of Green fluorescent protein (GFP).

GFP is driven by various promoters (genes) and therefore expressed in different cells and tissues in live nematode *Caenorhabditis elegans*. Worms carrying these transgenes are routinely used in our laboratory to mark cells or to follow the expression profile of the gene of interest. (A) *scm::gfp* expressed in the epidermal seam cells, (B) *ida-1::gfp* in neurons in the tail region, (C) *cdh-3::gfp* in the anchor cell and vulval precursor cells, (D) *ajm-1::gfp* in adherence junction of vulval cells, (E) *lag-2::gfp* in somatic gonad precursors and motor neurons, (F) *nhr-25::gfp* in syncytial epidermal cell and P cells, (G) *nhr-25::gfp* in the epidermal seam cells, (H) *mbf-1::gfp* in vulva forming cells and uterus. (Photographed by M. Hajdušková, N. Bojanala and M. Asahina-Jindrová.)

Institute of Parasitology, Biology Centre of the Academy of Sciences of the Czech Republic, v.v.i.

BIENNIAL REPORT
A Brief Survey of the Intitute's Organisation and Activities (2008−2009)

Published in June 2010
Edited by Dana Hanzliková Vašková and Tomáš Scholz
Printed by Protisk, České Budějovice

ISBN 978-80-254-7194-4

CZECH REPUBLIC

Address: INSTITUTE OF PARASITOLOGY
Biology Centre of the Academy of Sciences of the Czech Republic, v.v.i.
Branišovská 31, CZ-370 05 České Budějovice
Phone: +420 385 310 351 or +420 387 775 403
Fax: +420 385 310 388

http://www.paru.cas.cz