

CV David Leitsch

Name: David Alexander Leitsch
Marital status: married, two children (Attila *Dec 14th 2009 and Felix *May 29th 2012)
Date of Birth: 8th of May, 1978, in Vienna, Austria.
Laboratory: Institut für Spezifische Prophylaxe und Tropenmedizin, Zentrum für Pathophysiologie, Infektiologie und Immunologie, Medizinische Universität Wien, A-1090 Vienna, Austria
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MAIN AREA OF RESEARCH: Molecular biology of protist parasites.

EDUCATION:

2003 - 2007: University of Vienna, PhD study in genetics, Dr. rer. nat (PhD); thesis entitled: “Proteomics in *Entamoeba* spp.: comparative proteome profiling and search for drug targets”
1996 - 2002: University of Vienna, study in genetics, Mag. rer. nat. (MSc); thesis entitled: “Studies on the RNA-chaperone-like protein Hfq in *Escherichia coli*”.

EMPLOYMENT:

06/2019- Tenure track Assistant Professor at the Institute of Specific Prophylaxis and Tropical Medicine at the Medical University of Vienna
03/2016 - Research fellow at the Institute of Specific Prophylaxis and Tropical Medicine at the Medical University of Vienna (funded by the Austrian Science Fund)
03/2014 – 02/2016 Schroedinger research fellow at the Institute of Parasitology at the University of Berne, Switzerland (funded by the Austrian Science Fund)
07/2010 – 02/2014 Senior Post-Doc/independent researcher at the Institute of Specific Prophylaxis and Tropical Medicine at the Medical University of Vienna (funded by the Austrian Science Fund)
09/2006 - 06/2010 Postgraduate Research Student/Postdoctoral Research Fellow in the work group of Univ. Doz. Dr. Julia Walochnik at the Institute of Specific Prophylaxis and Tropical Medicine at the Medical University of Vienna (funded by the Austrian Science Fund)
10/2003 – 08/2006: Postgraduate Research Student in the work group of Prof. Dr. Michael Duchêne, at the Institute of Specific Prophylaxis and Tropical Medicine at the Medical University of Vienna. (funded by the Austrian Science Fund)

AWARDS:

2013: Erwin Schrödinger Scholarship of the Austrian Science Fund
2010: Microbiology Prize of the Austrian Society for Hygiene, Microbiology, and Preventive Medicine.
2010: Researcher of the Month of the Medical University of Vienna (Jan. 2010).
2008: Sanofi-Aventis Prize.
2006: 3rd Prize of the Junior Award of the Austrian Society for Tropical Medicine and Parasitology (ÖGTP).

2005: 1st Prize of the Junior Award of the Austrian Society for Tropical Medicine and Parasitology (ÖGTP).

REVIEWING ACTIVITIES FOR:

National Institutes of Health (NIH)
Czech Science Fund (GAČR)
Journal of Antimicrobial Chemotherapy
Antimicrobial Agents and Chemotherapy
Anaerobe
Molecular and Biochemical Parasitology
PLoS Neglected Tropical Diseases
International Journal for Parasitology: Drugs and Drug Resistance
Journal of Proteome Research
Parasitology
TRENDS in Parasitology
Molecular and Biochemical Parasitology
Experimental Parasitology
Parasitology
Parasitology International
Parasitology Research
Protist
Journal of Eukaryotic Microbiology
Journal of Medical Microbiology
Sexually Transmitted Infections
Journal of Medicinal Chemistry

MEMBERSHIPS:

F1000 Faculty member, section Microbiology/Parasitology
Austrian Society for Tropical Medicine and Parasitology (ÖGTP)
German Society for Parasitology (DGP)

GRANTS HELD:

11/2019 – 10/2022: Nim-mediated metronidazole resistance in *B. fragilis* (€ 322,284)
Project I 4234 of the Austrian Science Fund
03/2014 – 02/2017: Thioredoxin reductase in *G. lamblia*
Erwin Schrödinger Scholarship of the Austrian Science Fund J3492 (€ 166.57)
07/2010 – 02/2014: Mechanisms of metronidazole resistance in *T. vaginalis* (€ 252,189)
Project 22546-B11 of the Austrian Science Fund

SCIENTIFIC COLLABORATIONS:

József Sóki (Institute of Clinical Microbiology, University of Szeged, Hungary)
Daniel Kolarich (Max Planck Institute of Colloids and Interfaces, Potsdam, Germany)
Iain Wilson (University of Natural Resources and Life Sciences, Vienna, Austria)
David Lloyd and Catrin Williams (University of Cardiff, Wales, UK)
Patricia Johnson (University of California in Los Angeles, LA, USA)
Lars Eckmann (University of California in San Diego, La Jolla, USA)
Norbert Müller (University of Berne, Switzerland)
Patrice Vanelle and Kevin Neilde (Aix-Marseille Université, France)

INVITED LECTURES:

08/2014 : Thirteenth International Congress on Parasitology (ICOPA XIII), Mexico City, Mexico
04/2017 : Annual Conference of the Microbiology Society, Edinburgh, UK
09/2017 : 6th International Conference on Anaerobic Protists (ICAP VI), Newcastle, UK

List of Publications: David Leitsch (2002 – 2020)

*indicates corresponding authorship

1. Lamien-Meda A., Schneider R., Walochnik J., Auer H., Wiedermann U., Leitsch D. (2020) A novel 5-Plex qPCR-HRM assay detecting human diarrheal parasites. *Gut Pathogens* **12**:27.
2. Argüello-García R., Leitsch D., Skinner-Adams T., Ortega-Pierres M.G. (2020) Drug resistance in *Giardia*: Mechanisms and alternative treatments for Giardiasis. *Adv Parasitol.* **107**:201-282.
3. Müller J., Vermathen M., Leitsch D., Vermathen P., Müller N. (2020) Metabolomic profiling of wildtype and transgenic *Giardia lamblia* strains by ¹H HR-MAS NMR spectroscopy. *Metabolites* **10**:53.
4. Lamien-Meda A., Leitsch D.* (2020) Identification of the NADH-oxidase gene in *Trichomonas vaginalis*. *Parasitol Res.* **119**:683-686.
5. Drinić M., Raninger A., Zraunig A., Astelbauer F., Leitsch D., Obwaller A., Walochnik J., Greger H., Duchene M. (2019) Activity of methylgerambullin from *Glycosmis* species (Rutaceae) against *Entamoeba histolytica* and *Giardia duodenalis* in vitro. *Int J Parasitol Drugs Drug Resist.* **10**:109-117.
6. Leitsch D.*, Williams, C.F., Hrdý I. (2018) Redox pathways as drug targets in microaerophilic parasites. *Trends Parasitol.* **34**: 576-589.
7. Leitsch D.* (2017) A review on metronidazole: an old warhorse in antimicrobial chemotherapy. *Parasitology* **23**:1-12.
8. Leitsch, D.* (2017) Drug susceptibility testing in microaerophilic parasites: cysteine strongly affects the effectivities of metronidazole and auranofin, a novel and promising antimicrobial. *Int. J. Parasitol. Drugs Drug Resist.* **7**:321-327.
9. Leitsch, D.*, Rout S., Lundström-Stadelmann B., Balmer V., Hehl A., Müller N. (2017) *Giardia lamblia*: missing evidence for a canonical thioredoxin system. *Parasitol. Open* **3**:e13.
10. Leitsch D.*, Müller J., Müller N. (2016) Evaluation of *Giardia lamblia* thioredoxin reductase as drug activating enzyme and as drug target. *Int. J. Parasitol. Drugs Drug Resist.* **6**:148-153.

11. Leitsch D.* (2016) Recent advances in the *Trichomonas vaginalis* field. *F1000Research* **5**:162.
12. Müller J., Rout S., Leitsch D., Vaithilingam J., Hehl A., Müller N. (2015) Comparative characterisation of two nitroreductases from *Giardia lamblia* as potential activators of nitro compounds. *Int. J. Parasitol. Drugs Drug Resist.* **5**:37-43.
13. Leitsch D.* (2015) Drug resistance in the microaerophilic parasite *Giardia lamblia*. *Curr. Trop. Med. Rep.* **2**:128-135.
14. Kranzler M., Syrowatka M., Leitsch D., Winnips C., Walochnik J. (2015) Pentamycin shows high efficacy against *Trichomonas vaginalis*. *Int. J. Antimicrob. Agents.* **45**:434-7.
15. Pumidonming W., Koehsler M., Leitsch D., Walochnik J. (2014) Protein profiles and immunoreactivities of *Acanthamoeba* morphological groups and genotypes. *Exp. Parasitol.* **145** Suppl:S50-6.
16. Leitsch D.*, Sóki J., Kolarich D., Urbán E., Nagy E. (2014) A study on Nim expression in *Bacteroides fragilis*. *Microbiology* **160**:616-22.
17. Leitsch D.*, Janssen BD, Kolarich D, Johnson PJ, Duchêne M (2014) *Trichomonas vaginalis* flavin reductase 1 (FR1) and its role in metronidazole resistance. *Mol. Microbiol.* **91**: 198-208.
18. Leitsch D*., Williams C.F., Lloyd D, Duchêne M. (2013) Unexpected properties of NADP-dependent secondary alcohol dehydrogenase (ADH-1) in *Trichomonas vaginalis* and other microaerophilic parasites. *Exp. Parasitol.* **134**: 374-380.
19. Tejman-Yarden N., Miyamoto Y., Leitsch D., Santini J., Debnath A., Gut J., McKerrow J.H., Reed S.L. Eckmann L. * (2013) Auranofin, a reprofiled drug, is effective against metronidazole-resistant *Giardia lamblia*. *Antimicrob. Agents Chemother.* **57**: 2029-2035.
20. Schlosser S., Leitsch D., Duchêne M. (2013) *Entamoeba histolytica*: identification of thioredoxin-targeted proteins and analysis of serine acetyltransferase-1 as a prototype example. *Biochem. J.* **451**: 277-288.

21. Leitsch D*, Schlosser S., Burgess A., Duchêne M. (2012) Nitroimidazole drugs vary in their mode of action in the human parasite *Giardia lamblia*. *Int. J. Parasitol. Drugs Drug Resis.* **2**: 166-170.
22. Williams C.F., Lloyd D., Kolarich D., Alagesan K., Duchêne M., Cable J., Williams D., Leitsch D. (2012) Disrupted intracellular redox balance of the diplomonad fish parasite *Spironucleus vortens* by 5-nitroimidazoles and garlic-derived compounds. *Vet. Parasitol.* **190**: 62-73.
23. Leitsch D*, Drinić M., Duchêne M. (2012) Down-regulation of flavin reductase and alcohol dehydrogenase-1 (ADH-1) in metronidazole-resistant isolates of *Trichomonas vaginalis*. *Mol. Biochem. Parasitol.* **183**: 177-183.
24. Reinmann K., Müller N., Kuhnert P., Campero C.M., Leitsch D., Hess M., Henning K., Fort M., Müller J., Gottstein B., Frey C.F. * (2012) *Tritrichomonas foetus* isolates from cats and cattle show minor genetic differences in unrelated loci ITS-2 and EF-1 α . *Vet. Parasitol.* **185**: 138-144.
25. Paschinger K., Hykollari A., Razzazi-Fazeli E., Greenwell P., Leitsch D., Walochnik J. Wilson I.B. (2012) The N-glycans of *Trichomonas vaginalis* contain variable core and antennal modifications. *Glycobiology* **22**: 300-313.
26. Leitsch D., Burgess A.G., Dunn L.A., Krauer K.G., Tan K, Duchêne M., Upcroft P., Eckmann L., Upcroft J.A. (2011) Pyruvate:ferredoxin oxidoreductase and thioredoxin reductase are involved in 5-nitroimidazole activation while flavin metabolism is linked to 5-nitroimidazole resistance in *Giardia lamblia*. *J. Antimicrob. Chemother.* **66**: 1756-1765.
27. Leitsch D* , Kolarich D., Duchêne M. (2010) The flavin inhibitor diphenyliodonium renders *Trichomonas vaginalis* resistant to metronidazole, inhibits thioredoxin reductase and flavin reductase, and shuts off hydrogenosomal enzymatic pathways. *Mol. Biochem. Parasitol.* **171**: 17-24.
28. Leitsch D., Köhler M., Marchetti-Deschmann M., Deutsch A., Allmaier G., Duchêne M., Walochnik J. (2010) Major role for cysteine proteases during the early phase of *Acanthamoeba castellanii* encystment. *Eukaryot. Cell* **9**: 611-618.

29. Leitsch D., Köhler M., Marchetti-Deschmann M., Deutsch A., Allmaier G., König L., Sixt B.S., Duchêne M., Walochnik J. (2010) Proteomic aspects of *Parachlamydia acanthamoebae* infection in *Acanthamoeba* spp. *ISME J.* **4**: 1366-1374.
30. Koehsler M., Leitsch D., Duchêne M., Nagl M., Walochnik J. (2009) *Acanthamoeba castellanii*: growth on human cell layers reactivates attenuated properties after prolonged axenic culture. *FEMS Microbiol. Lett.* **299**: 121-127.
31. Leitsch D*, Kolarich D., Binder M., Stadlmann J., Altmann F., Duchêne M. (2009) *Trichomonas vaginalis*: metronidazole and other nitroimidazole drugs are reduced by the flavin enzyme thioredoxin reductase and disrupt the cellular redox system. Implications for nitroimidazole toxicity and resistance. *Mol. Microbiol.* **72**: 518-536.
32. Tazreiter M., Leitsch D., Hatzenbichler E., Mair-Scorpio G.M., Steinborn R., Schreiber M., Duchêne M. (2008) *Entamoeba histolytica*: response of the parasite to metronidazole challenge on the levels of mRNA and protein expression. *Exp. Parasitol.* **120**: 403-410.
33. Köhler M., Leitsch D., Fürnkranz U., Duchêne M., Aspöck H., Walochnik J. (2008) *Acanthamoeba* strains lose their abilities to encyst synchronously upon prolonged axenic culture. *Parasitol. Res.* **102**: 1069-1072.
34. Leitsch D., Kolarich D., Wilson I.B.H., Altmann F. and Duchêne M. (2007) Nitroimidazole Action in *Entamoeba histolytica*: A Central Role for Thioredoxin Reductase. *PLOS Biology*, **5**: e211.
35. Tasanor O., Brem B., Leitsch D., Binder M., Duchêne M., Greger H., Wernsdorfer W.H. (2007). Development of a pharmacodynamic screening model with *Entamoeba histolytica*. *Wien. Klin. Wochenschr.* **119** (SUPPL. 3): 88-95.
36. Leitsch D., Wilson I.B.H., Paschinger K. and Duchêne M. (2006) Comparison of the proteome profiles of *Entamoeba histolytica* and its close but non-pathogenic relative *Entamoeba dispar*. *Wien. Klin. Wochenschr.* **118** (Suppl. 3): 37-41
37. Leitsch D., Radauer C., Paschinger K., Wilson I.B.H., Breiteneder, H., Scheiner, O., Duchene, M. (2005) *Entamoeba histolytica*: analysis of the trophozoite proteome by two-dimensional polyacrylamide gel electrophoresis. *Exp Parasitol.* **110**: 191-5.

38. Moll I., Leitsch D., Steinhäuser, T., Bläsi, U. (2003) RNA chaperone activity of the Sm-like Hfq protein. *EMBO Reports* **4**: 284-9.