

II Workshop ResNet NPND

(Research Network Natural Products against Neglected Diseases)



November, 25-28th, Rio de Janeiro, Brazil

*Universidade Federal do Rio de Janeiro
FIOCRUZ-RJ.*

Organizing Committee

Prof. Dr. Suzana Guimarães Leitão, Faculdade de Farmácia, UFRJ.

Dr. Solange Lisboa de Castro, Fiocruz, RJ.

Dr. Maria de Nazaré Soeiro, Fiocruz, RJ

Prof. Dr. Vitor Francisco Ferreira, Instituto de Química, UFF.

Karine Martins, Pharmacist, UFRJ.

Leilane Falcão, Pharmacist, UFRJ.

Prof. Dr. Thomas J. Schmidt, Münster, Coordinator of ResNet

1st Day –Tuesday, 25/11, UFRJ

9:00h -9:30h - Presentation of ResNet NPND to Non-members and Researchers, Auditorium Profa. Maria Thereza Loureiro Lima, Prof. Levy Gomes Ferreira Building

The first day of the meeting began with an opening ceremony at the School of Pharmacy, at the Federal University of Rio de Janeiro (UFRJ) with the presence of Prof. Dr. Gisela Dellamora Ortiz, Director of the School of Pharmacy; Dr. Wilson Savino, Director of the Oswaldo Cruz Institute; Prof. Dr. Thomas J. Schmidt, University of Munster, International Coordinator of ResNet; Prof. Dr. Alvaro Romanha, Latin American Coordinator of Resnet; Dr. Ricardo Schuch, Executive Director of the Brazilian Center of the Münster University; Dr. Vitor Francisco Ferreira, representing the Scientific Director of FAPERJ (one of the financial agencies that supported the meeting) and Prof. Dr. Andrew MacRae, representing the Dean of CCS-UFRJ and Coordinator of International Relations for the Health Sciences Center at the Federal University of Rio de Janeiro. After hearing to the national hymn of Brazil, each representative spoke a few words, and the meeting was declared open.

9:00h -9:30h Presentation of ResNet NPND to Non-members and Researchers, Auditorium Profa. Maria Thereza Loureiro Lima, Prof. Levy Gomes Ferreira Building



After the opening ceremony, Prof. Alvaro Romanha from the Federal University of Santa Catarina, Brazil, gave a very beautiful speech about “*Neglected Tropical Diseases*”. He gave us a brilliant and detailed overview on a variety of diseases which certainly many of us had not heard about before! With his quiet and yet passionate way, I believe Prof. Romanha touched each one at the audience about the importance of the research in the field. Many questions and comments of the conference were made. Prof. Thomas J. Schmidt was the moderator of this session and coordinated the discussion after Prof. Romanha’s presentation.

9:30h-10:10h

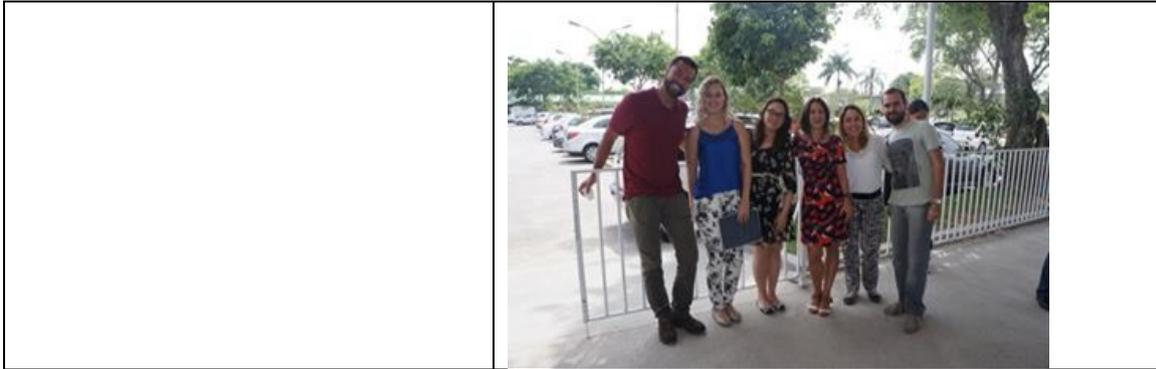
Prof. Alvaro Romanha - Universidade Federal de Santa Catarina: *Neglected Tropical Diseases.*



After that, we had a moment to congregate in the Coffee-break, served in the open, outside the School of Pharmacy building.

10:20-10:50h *Coffee Break*





After the Coffee-break, we enjoyed the very suspenseful presentation from Prof. Dr. Sami A. Khalid, from the University of Science and Technology, Omdurman, Suda, entitled “*Development of microtiter plate-based method for the determination of the MIC of antimycetomal agents against Madurella mycetomatis*”. It was a very interesting presentation about this so uncommon and particular progressively destructive chronic infectious disease with a high morbidity. The increasing resistance of these pathogenic microorganisms to existing antibiotics (e.g. amphotericin B, various azoles, 5-flucytosine, and the echinocandins) and its growing threat to public health warrant an immediate search for novel classes of bioactive agents against *M. mycetomatis*, and this is what Dr. Sami showed to the audience that day: his presentation dealt with the development of an assay in 96-well microplate format based on resazurin dye as an indicator of cell viability of *M. mycetomatis*, allowing rapid testing of large numbers of samples followed by bioactivity-guided fractionation, with simple equipment and at reduced cost. Innumerable examples were shown and he opened the doors to new collaborative work with the members of ResNet NPND. His presentation was followed by lots of questions and comments. It was later on decided that ResNet NPND will include Mycetoma in its research portfolio, besides protozoan infections.

<p>10:50-11:30h Prof. Dr. Sami A. Khalid, University of Science and Technology, Omdurman, Sudan: <i>Development of microtiter plate-based method for the determination of the MIC of antimycetomal agents against Madurella mycetomatis</i></p>	
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Following the program, we had next another very interesting presentation from Prof. Dr. Bartira Rossi Bergmann, from Instituto de Biofísica Carlos Chagas Filho, UFRJ, entitled “*Plants as sources of new antileishmanials.*” Although Dr. Bartira is not a member of ResNet NPND, due to her expertise and outstanding works with natural products and Leishmaniasis, she had been invited to present her achievements. Her talk gave us two very nice examples of Brazilian medicinal plants – *Kalanchoe pinnata* and *Piper aduncum* that led to the discovery of an active flavonoid and a chalcone, for which Lipid-core and cyclodextrin nanocapsules were developed, in an attempt to improve their pharmacokinetics.

11:30h-12:10h

Prof. Dr. Bartira Rossi Bergmann, Instituto de Biofísica Carlos Chagas Filho, UFRJ: *Plants as sources of new antileishmanials*



After this exciting morning, we went to a lunch break at the restaurant Couve Flor, at the university technological pole. There, we had a private room only for ResNet NPND members, and it was a moment to relax and interact with each other, in an informal environment.

12:00h-14:00h – Lunch



After lunch, the program continued with a beautiful presentation of Prof. Dr. Victor Ogungbe, from Jackson State University, USA, entitled “*Targeting the Major Cysteine Protease of Trypanosoma brucei rhodesiense.*” Rhodesain from *T. brucei* is one of the most promising and sufficiently validated drug targets in this parasite. In his talk, Dr. Victor highlighted some of the inhibitors of rhodesain that were characterized by his research group, and that are being optimized for enhanced inhibition and potency. These inhibitors include compounds that were isolated from tropical plants as well as compounds that were identified by virtual screening of targeted antiparasitic compound libraries. Once again, this successful conference, chaired by Prof. Thomas Schmidt, was followed by intense and very constructive discussion.

14:00-14:30h

Prof. Dr. Victor Ogungbe, Jackson State University, Jackson, USA:
Targeting the Major Cysteine Protease of Trypanosoma brucei rhodesiense.



The last presentation of the day was by Dr. Ricardo Augusto Pereira de Pádua, from Faculdade de Ciências Farmacêuticas de Ribeirão Preto, Brazil, entitled “*Fumarase as a new macromolecular target to fight Chagas disease*”. Dr. Ricardo is a young post-doctor researcher at Prof. Maria Cristina Nonato’s laboratory and presented the results of his group that confirmed the essentiality of a new macromolecular target, the fumarase enzymes, to *T. cruzi*. Based on the differences with the human analogous, they designed the first selective inhibitor of the parasite enzyme. Again, the beauty and importance of these findings led to many interested questions and constructive comments, once more chaired by Prof. Thomas Schmidt.

14:45h-15:05h - Dr. Ricardo Augusto Pereira de Pádua, Faculdade de Ciências Farmacêuticas de Ribeirão Preto, Universidade de São Paulo, Brazil: *Fumarase as a new macromolecular target to fight Chagas disease*.



After the afternoon presentations we had another Coffee-Break in the open and came back to the conference room for the concluding remarks of the day. Unfortunately, the remaining speeches scheduled for this day had to be postponed to the second day since the group of researchers from Nigeria were trapped on their way by bad weather and their arrival was delayed one day!

The presentations of this first day were extremely exciting and of highest quality, with lots of interaction and discussion with the audience. Fifty people signed the presence list and many students attended the first day of the meeting since this was included as one of the academic activities of the Pharmaceutical Sciences Graduate Course of the UFRJ School of Pharmacy.

To close the day, Prof. Suzana Leitão suggested that all participants gathered for dinner at a famous barbecue house in Rio de Janeiro, with a nice view of Pão de Açúcar. Those who still had some energy after the heavy activities of the day met at a classical Brazilian Churrascaria, at Botafogo beach, and we had a very nice time to recreate!



2nd Day, Wednesday, 26/11, UFRJ

Report on the Recent Achievements of ResNet Members

Auditorium Profa. Maria Thereza Loureiro Lima, Prof. Levy Gomes Ferreira Building

On the second day of the meeting we were all relieved about the arrival of our colleagues from Nigeria who had spent more than 72 hours on their journey to Rio! The day was full of very nice presentations from ResNet members as follows:

The first conference of the day was presented by Prof. Dr. Fernando B. Da Costa: USP, Ribeirão Preto, whose title was “*Sesquiterpene lactones with leishmanicidal activity*”. His talk described the test of a sesquiterpene lactone-rich preparation - a leaf rinse extract (LRE) from *Tithonia diversifolia* (Mexican sunflower), against promastigote forms of *L. braziliensis*, and the individual activity of at least eight sesquiterpenelactones, being this the first report on sesquiterpene lactones that have potent leishmanicidal effects on both developmental stages of *L. braziliensis*. The talk was followed by an interesting discussion.

9:00h-9:20h - Prof. Dr. Fernando B. Da Costa: USP, Ribeirão Preto, SP:.
Sesquiterpene lactones with leishmanicidal activity.



Next, we had the presentation of Prof. Dr. Joao Lago, from UNIFESP, Diadema, SP, entitled “*PLANTS OF BRAZILIAN BIODIVERSITY - an inexhaustible source of new compounds with antiparasitic action.*” In his presentation Dr. Joao addressed the research that his group has been developing in the study of several plant species that occur in Brazilian biomes such as Atlantic Forest, “Cerrado” (savanna like) and Amazonian region in order to identify those that present antiparasitic potential. The crude extracts are subjected to bioassays in order to select those with potential antiparasitic activity, especially antileishmanial and anti-*T. cruzi*. Using a bioassay-guided fractionation procedure approach, the active metabolites are purified by chromatographic techniques and their structures are determined by spectroscopic/spectrometric techniques. As results, he described the studies that were conducted with *Nectandra leucantha* (Lauraceae), *Calophyllum brasiliense* (Clusiaceae), *Drimys brasiliensis* (Winteraceae) *Schinus terebinthifolius* (Anacardiaceae) and *Alchornea glandulosa* (Euphorbiaceae), to afford different new bioactive compounds, including phenylpropanoid derivatives, alkaloids, terpenoids and coumarins. In addition, some chemical modifications based on the structures of bioactive natural products allowed to establish relationships between chemical structure/biological activity of these compounds. Again, the discussion was very exciting and interesting.

9:20h-9:40h – Prof. Dr. Joao Lago, UNIFESP, Diadema, SP: *PLANTS OF BRAZILIAN BIODIVERSITY - an inexhaustible source of new compounds with antiparasitic action.*

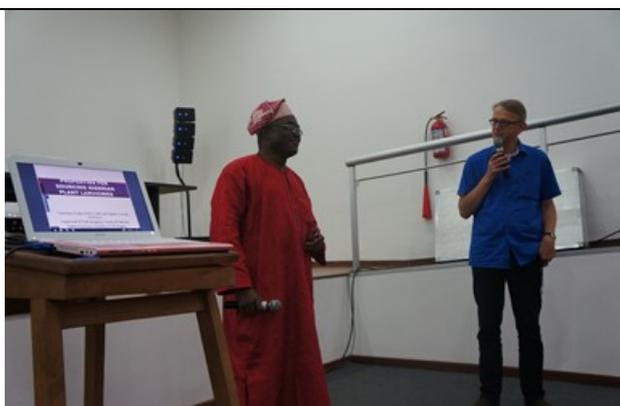


Following Dr. Joao's presentation, Prof. Dr. Adeleke Adebajo, from Obafemi Awolowo University, Faculty of Pharmacy, Nigeria presented his student's works. They were: *Properties for Sourcing Nigerian Plant larvicides* from Mrs Funmilayo Gladys FAMUYIWA, Ph.D. Student, from Obafemi Awolowo University, Nigeria; and "*Potentials of Nigerian Ethnomedicinal plants as Antimalarial Herbal Combination Therapy*" from Mr. Samuel Akintunde ODEDIRAN, Ph.D. Student, from Obafemi Awolowo University, Nigeria. Interesting results were presented such as 61 % of the assayed plants against *Aedes aegypti* demonstrated high to moderate larvicidal activities while extracts of *Piper nigrum*, *Abrus precatorius* and *Xylopiya aethiopica* seeds, *Blighia sapida* stem bark and *Costus speciosus* root were the most active. These talks were supposed to have been presented the previous day, hadn't it been for the bad weather in Abu Dhabi which forced their airplane to a detour and unintended delay in Dubai! Apart from all problems faced to get to Brazil, Dr. Adeleke conquered us all with his joy and high spirits! These very nice presentations were again followed by fruitful discussion. The session was chaired by Prof. Thomas.

Mrs Funmilayo Gladys FAMUYIWA, Ph.D. Student, Obafemi Awolowo University, Nigeria: *Properties for Sourcing Nigerian Plant larvicides.*

Mr. Samuel Akintunde ODEDIRAN, Ph.D. Student, Obafemi Awolowo University, Nigeria. *Potentials of Nigerian Ethnomedicinal plants as Antimalarial Herbal Combination Therapy.*

Presented by Prof. Dr. Adeleke Adebajo



After that, we had again the Coffee-break served in the open, outside the School of Pharmacy building.

The next set of conferences was chaired by Dr. Jandirk Sendker.

First we had the presentation of Dr. Tânia M. A. Alves, from CPqRR, Fiocruz Minas, which talk was "*Bioactive Natural Products: our the experience at Fiocruz Minas Gerais*". She gave us an inspiring overview of the work and methodologies used by her group in the search for new bioactive compounds against neglected diseases.

Dr. Tânia M. A. Alves, from CPqRR, Fiocruz Minas: “*Bioactive Natural Products: our the experience at Fiocruz Minas Gerais*”



Discussion followed and next, we had a suspenseful presentation from Prof. Dr. Norberto Peporine Lopes, from Ribeirão Preto, SP, entitled: “*In vitro and In vivo metabolism of biological active natural products*”. He talked about the chemical characterization of active targets and the elucidation of possible metabolites as prerequisites for clinical and compound stability studies. In this context, the research of his group aims at the establishment of a working platform that envisions supporting pre-clinical studies. In his presentation, he showed an overview about the platform using some lignoids with trypanocidal activity as illustrative molecules.

11:00h-11:20h – Prof. Dr. Norberto Peporine Lopes, Ribeirão Preto, SP: *In vitro and In vivo metabolism of biological active natural products*



The next presentation was from Prof. Dr. Tavs A. Abere, from the Department of Pharmacognosy, University of Benin, Benin, Nigeria, entitled: “*Toxicological evaluation of Annona muricata leaf ethanolic extract used to treat some tropical neglected diseases.*” He evaluated the toxicity of the leaf methanolic extract of *A. muricata*, which is ethnomedicinally used in the treatment of Human African Trypanosomiasis (Sleeping Sickness), Schistosomiasis and Dengue fever. The chronic toxicity was observed, and may call for caution when using *A. muricata* in treating these neglected tropical diseases (or any other condition). An interesting discussion followed.

Prof. Dr. Tavs A. Abere, Department of Pharmacognosy, University of Benin, Benin, Nigeria: *Toxicological evaluation of Annona muricata leaf ethanolic extract used to treat some tropical neglected diseases.*



After another morning of very exciting presentations, we went to a lunch break, once more at the restaurant Couve Flor, at the university technological pole.

In the afternoon, the program continued with the natural products session, chaired by Prof. Fernando B. Costa.

The first speaker was Dr. Jandirk Sendker, from the Institute of Pharmaceutical Biology and Phytochemistry, University of Munster, Münster, with the talk entitled „*Identification of antiprotozoal constituents of Juglans regia by LC-MS based PLS*“. In his presentation, he addressed the method of *Partial Least Square Regression* (PLS) and how it was used to detect herbal constituents that –within an adequate sample set- covary with the biological activity of their respective samples. Each sample was (i) analysed by HPLC-MS in order to generate chemical fingerprints and (ii) tested for antiprotozoal activity against *Trypanosoma brucei rhodesiense*, *T. cruzi*, *Leishmania donovani* and *Plasmodium falciparum*. Consequently, PLS successfully predicted a bioactive constituent of *Juglans* species by correlating herbal extracts’ chemical fingerprints with their activity data. After this interesting presentation, a constructive discussion followed.

Dr. Jandirk Sendker, Institut für Pharmazeutische Biologie und Phytochemie, University of Munster, Münster: *Identification of antiprotozoal constituents of Juglans regia by LC-MS based PLS*



The next presentation was from Dr. Justina Nwodo Ngozi, from the University of Nigeria, Nsukka, Nigeria, entitled: “*Trypanocidal dipeptides from the roots of Zapoteca portoricensis*“. In her study, two dipeptides, were isolated from the methanol root extract of *Zapoteca portoricensis* and evaluated for their trypanocidal activity. One of the compounds exhibited considerable activity against *Trypanosoma brucei rhodesiense* with an IC₅₀ value of 3.63 μM and selectivity index of 25. These compounds could therefore, serve as trypanocidal leads. A nice discussion followed.

Prof. Dr. Justina Nwodo Ngozi, University of Nigeria, Nsukka, Nigeria: *Trypanocidal dipeptides from the roots of Zapoteca portoricensis*.



The next presentation was from Prof. Dr. Lianet Monzote Fidalgo, from La Habana, Cuba: *Antileishmanial Potentialities of Essential Oils from Cuban Plants*. She showed the evaluation of the antileishmanial effects of 13 essential oils (EO) from Cuban plants by in vitro assessment against promastigotes and intracellular amastigotes of *Leishmania amazonensis*. Of all EO evaluated, only 4 (31 %) showed in vitro activity and were characterized by gas chromatography. In particular, *Chenopodium*-oil demonstrated antileishmanial effect after intralesional and oral administration, which was higher than treatment with pure compounds. Then, two formulations were tested: a natural formulation based on nanoparticles and a combination of two pure compounds identified in the EO that showed synergism. These new

products, according to the speaker, could represent a future alternative to monotherapeutic antileishmanial agents.

Prof. Dr. Lianet Monzote Fidalgo, La Habana, Cuba: *Antileishmanial Potentialities of Essential Oils from Cuban Plants.*



Closing the presentations of the day the last talk was from Prof. Dr. William Setzer, from University of Alabama, USA, entitled “*Antileishmanial Activities of Cloudforest Plants from Monteverde, Costa Rica.*” His inspiring talk addressed the evaluation for *in-vitro* antileishmanial activity against *L. amazonensis* promastigotes of 73 different plant extracts from Monteverde, Costa Rica, representing 60 plants. In his presentation, beautiful pictures of field work with collecting plants were shown!

Prof. Dr. William Setzer, University of Alabama, USA: *Antileishmanial Activities of Cloudforest Plants from Monteverde, Costa Rica.*



For another day, the presentations were extremely exciting and of outstanding quality, with lots of interaction and discussion with the audience. Seventy people signed the presence list and many students attended the second day of the meeting as one of the academic activities of the Pharmaceutical Sciences Graduate Course of the UFRJ School of Pharmacy.

3rd Day, Thursday, 27/11, FIOCRUZ

**Report on the Recent Achievements of ResNet Members
And Future Perspectives of the Net**

Auditorium Emanuel Dias, Artur Neiva Building

The third and fourth day of the meeting were held at FIOCRUZ, at the *Auditorium Emanuel Dias, Artur Neiva Building*. It included conferences in the morning, as well as a brainstorming session in the afternoon for ResNet NPND members only.

The first session was coordinated by Dr. Tania Alves. The first conference of the day was presented by Prof. Dr. Marcus T. Scotti, from Universidade Federal da Paraíba; PB, whose title was: *Virtual screening of secondary metabolites to search compounds with antiprotozoal activity*. He explained how his group applied a ligand-based-virtual screening using machine learning with molecular descriptors and structure-based-virtual screening (docking) to select structures, from an in-house databank of secondary metabolites, with potential inhibitory activity against leishmaniasis and Chagas' diseases., and interesting questions and comments were raised during the following discussion.

9:00h-9:20h - Prof. Dr. Prof. Dr. Marcus T. Scotti, from Universidade Federal da Paraíba; PB: *Virtual screening of secondary metabolites to search compounds with antiprotozoal activity*



Next, we had the presentation of Prof. Dr. Vitor Francisco Ferreira, Instituto de Química, UFF *Synthesis of New Naphthoquinones exploring the o-Quinone Methide intermediates*. In his presentation Dr. Vitor addressed the successful research and recent advances that his group achieved in synthesis of new naphthoquinones exploring these o-quinone methide intermediates and their biological activities against targets related to Neglected Diseases. Again, the discussion was very exciting and interesting.

9:20h-9:40h – Prof. Dr. Vitor Francisco Ferreira, Instituto de Química, UFF *Synthesis of New Naphthoquinones exploring the o-Quinone Methide intermediates*



Following Dr. Vitor's presentation, Prof. Dr. Ericsson Coy-Barrera, from Bogota, Colombia presented his work entitled: *Lead finding from Plantæ columbianæ: looking for antileishmanial compounds*. It was particularly exciting to see the successful approach of combining botanical and chemical information with methods of molecular modelling/*in silico* drug design in Prof.

Ericsson's work that continuously leads to interesting new lead compounds against *Leishmania* infections.

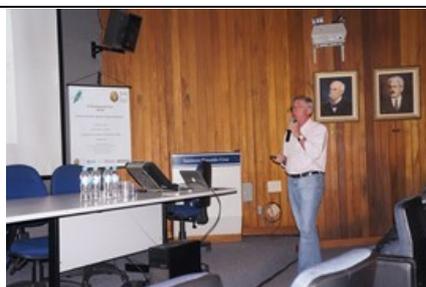
9:40h-10:00h - Prof. Dr. Ericsson Coy-Barrera, Bogota, Colombia: *Lead finding from Plantæ columbianæ: looking for antileishmanial compounds.*



The fruitful discussion after Prof. Ericsson's talk was followed by a nice Coffee-break served in the hall of the Artur Neiva Building.

The next set of conferences were chaired by Prof. Dr. Vitor F. Ferreira. First we enjoyed the presentation of - Prof. Dr. Mario Steindel, from Universidade Federal de Santa Catarina, SC, who talked about: "*Exploiting the Kinetoplastid parasites metabolism: Insights towards discovery of new drug targets*". He explained that kinetoplastid parasites' enzymes of the polyamine biosynthesis pathway are promising drug targets towards development of novel therapeutic agents against leishmaniasis and trypanosomiasis. He discussed the results of his group that demonstrate a stage-specific increase of protein expression and activity levels of LbrCS and LbrC β S resulting in high total thiol levels in response to both oxidative and nitrosative stress. Furthermore their results indicate that cysteine synthase is a specific and promising candidate for rational drug design of selective therapeutic inhibitors of *Leishmania* spp. infections.

10:50h-11:10h - Prof. Dr. Mario Steindel, from Universidade Federal de Santa Catarina, SC: *Exploiting the Kinetoplastid parasites metabolism: Insights towards discovery of new drug targets*



The intense discussion after Prof. Mario's talk was followed by an enthralling presentation by Dr. Maria de Nazaré Soeiro, from Fiocruz, RJ, entitled: *Experimental Chemotherapy For Chagas Disease: Mouse Models at Cellular Biology Laboratory Oswaldo Cruz Institute – FIOCRUZ* . She outlined the studies conducted by the group in the last years pursuing the efficacy of natural and synthetic compounds upon *T. cruzi* and the accumulated pre-clinical data related to their biological activity, toxicity, selectivity and mechanism of action.

11:10h-11:30h – Dr. Maria de Nazaré Soeiro, Fiocruz, RJ: *Experimental Chemotherapy For Chagas Disease: Mouse Models at Cellular Biology Laboratory Oswaldo Cruz Institute – FIOCRUZ*



The next presentation was delivered by Prof. Dr. Maria Cristina Nonato, SP, Ribeirão Preto, Brazil, entitled: *Development of novel anti-trypanosomatid drugs based on the structure of dihydroorotate dehydrogenase*. She demonstrated how the structure-based drug design approach is being used by her group in order to search for DHODH (the flavin containing enzyme dihydroorotate dehydrogenase) inhibitors. This enzyme has been suggested to be a potential target for drug development against trypanosomatids.

Prof. Dr. Maria Cristina Nonato, SP, Ribeirão Preto, Brazil: *Development of novel anti-trypanosomatid drugs based on the structure of dihydroorotate dehydrogenase*.



The following presentation was from Dr. Monica Caroline Oliveira Campos, a post-doc researcher at Fiocruz-RJ. Her conference was entitled “*Drug resistance in Trypanosoma cruzi*”. She presented her studies in the the group of Dr. L. Leon focused on two potential drug resistance mechanisms: 1) P-glycoprotein (Pgp) activity, associated with the multidrug resistance phenotype (MDR); 2) the enzyme nitroreductase (TcNTR) found in *T. cruzi*, responsible for the reduction of nitroheterocyclic derivatives, generating metabolites with trypanocidal activity. In the search for new selective drugs for the treatment of Chagas disease the group has been studying compounds from the class of the thiosemicarbazones.

Dr. Monica Caroline Oliveira Campos, a post-doc researcher at Fiocruz-RJ: *Drug resistance in Trypanosoma cruzi*.



The last presentation before lunch was, once more, delivered by Prof. Dr. Adeleke Adebajo, from Obafemi Awolowo University, Faculty of Pharmacy, Nigeria, who presented his work entitled: *Contribution of Some Nigerian Ethnomedicinal Plants to the Total Eradication of Malaria in Nigeria*. In this impressive talk he focused on the prophylactic, chemosuppressive and curative antiplasmodial activities of aqueous-ethanolic extracts of four Nigerian plants, singly and administered in various combinations with each other and standard drugs, using *Plasmodium berghei* infected mice. Results shown, besides potential benefits of certain plants/combinations indicated that combining some of the herbal drugs with CQ or PYR could

detrimentally affect the therapeutic efficacy of these standard drugs and increase the development of parasite resistance.

Prof. Dr. Adeleke Adebajo, from Obafemi Awolowo University, Faculty of Pharmacy, Nigeria, who presented his work entitled: *Contribution of Some Nigerian Ethnomedicinal Plants to the Total Eradication of Malaria in Nigeria.*



All those very sophisticated and interesting presentations were followed by intense and fruitful discussion. Thus, after another morning of high-class science, we enjoyed a delicious lunch in relaxing atmosphere in the restaurant at FIOCRUZ..

In the afternoon, the program continued with a discussion and brain-storming session for ResNet NPND members only. Prof. Thomas, who presented an overview on the activities of the Network since its foundation in 2011 in Münster, Germany, and the aims and scopes of the net, coordinated the session. A balance of the activities and new associates was presented and some reflections for future perspectives were made. As one very important point, the members decided to include Mycetoma as a further focus in the network’s research portfolio. Among many other issues, it was also decided that, henceforth, regular scientific meetings of ResNet NPND will be held every two years. As potential location for the next meeting in 2016, Bogotá, Colombia was chosen and Prof. Dr. Ericsson Coy-Barrera declared his consent to explore the possibilities to organize this event.

Brain Storming Session with the ResNet NPND members, coordinated by Prof. Thomas Schimdt.



For another day, the presentations were extremely exciting and of high quality, with lots of interaction and discussion with the audience. Sixty people signed the presence list of the morning activities.

4th Day, Friday, 28/11, FIOCRUZ

Auditorium Emanuel Dias, Artur Neiva Building

IOC

The fourth day of the meeting was held again at FIOCRUZ, at the *Auditorium Emanuel Dias, Artur Neiva Building*, and it was part of the activities of the Study Center of IOC (Instituto Oswaldo Cruz). This day we could enjoy a very nice talk by Prof. Dr. Thomas J. Schmidt, University of Münster, Germany, who talked about *“Natural Products against Neglected Diseases – recent advances of our research within ResNet NPND”*. His presentation focused on investigations on the antiprotozoal activity of NPs in his group, with a major focus on experimental and computational chemistry studies to identify new compounds with activity against *Trypanosoma*, *Leishmania* and *Plasmodium* species. Besides the many results of his studies, a short view on future perspectives for natural products and ResNet NPND in the quest for new therapies against neglected diseases were given.

Prof. Dr. Thomas J. Schmidt, University of Münster, Germany: *“Natural Products against Neglected Diseases – recent advances of our research within ResNet NPND”*



After the presentation, a round table was set with the presence of FIOCRUZ representatives as follows – Dr. Benjamin Gilbert, Dr. Maria das Dores Dutra Behrens and Dr. Maria de Nazaré Soeiro, as well as the local organizer of the meeting, Prof. Dr. Suzana G. Leitão. A lot of discussion followed, with many questions raised by the audience, moderated by Dr. Eduardo Caio Torres dos Santos. Thirty four ResNet members signed the presence list of the morning activities but many more guests participated.



After this session, Prof. Thomas closed the meeting and all the participants went for lunch, which was followed by a visitation to the impressive Fiocruz Castle and museum.

Overall, the meeting was very successful due to the many exciting contributions of outstanding quality, the inspiring discussions between all participants and the intense interaction at all levels, strengthening the many existing collaborations and leading to the establishment of many new ones.

We all look forward to the next meeting, hopefully in Colombia!

S. G. Leitão

T. J. Schmidt

