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DIRECTION AND ADMINISTRATION

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PROGRAMM DOCTORAL SECRETARY

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Mr Yann MANET
Mr Loris FRANCO
Mr Francisco MABIALA (auxiliary)
ABBREVIATIONS

PO  Full Professor
PAS  Associate Professor
PAST  Assistant Professor
PT  Adjunct Professor
PI  Visiting Professor
PD  Privat-Docent
MER / CC  Senior Lecturer
CE  Lecturer
CS  Research Associate and Senior Research Associate
MA  Senior Research and Teaching Assistant
POSTDOC Postdoctoral Scholar
ASS  Research and Teaching Assistant
# Committees of the School of Pharmaceutical Sciences

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Denis HOCHSTRASSER
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Emerson FERREIRA QUEIROZ
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Olivier JORDAN
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Christian STAUB (Until 31.7.2016)
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Sylvian CRETTON
Thibaut DE SMEDT, (since 1.3.2016)
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Szabolcs FEKETE
Monia GUIDI
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Oscar VADAS

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Pierre-Marie ALLARD, (since 1.8.2016)
Andrej BABIC (until 31.7.2016)
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Claudia SIMOES AVELLO
Sebastien TARDY
Magali ZEISSER

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Adlin binti AFZAN
Bandar ALGHANEM
Imène ATEB
Vineetha CHELLAKUDAM
Yosra ELLEMSI
Si GOU
Somnath KANDEKAR
Alessandra NURISSO
Vasundhara TYAGI
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Abdulelah ALFATTANI
Chiara AMBUEHL
Isabelle ANGELSTORF
Imène ATEB
Leire AZURMENDI
Antonio AZZOLLINI
Noura BAWAB
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Yoric GAGNEBIV
Elinam GAYI
Si GOU
Alexandre GOYON
Floriane GROELL
Nicolas GUICHARD
Viktorija HERCEG
Joëlle HOURIET
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Ameena JESAIMANI
Susan KAMAL ABDELRAHMAN
Somnath KANDEKAR
Linnéa LAGERSTEDT
Mélanie LELUBRE
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Franck MARQUET
Niloufar MARSOUSI
Pierre MAUDENS
Mohamed MOHAMED
Aymeric MONTEILLIER
Inès MOTTAS
Ivana NOVAKOVIC
Lucie OBERHAUSER
Véra OLRATI
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Leonie PELLISSIER
Charlotte PETIT
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Giuseppina PISIGNANO
Michel RAETZ
Sakthikumar RAGUPATHY
Davide RIGHI
Stéphanie ROMAND
Lionel SACCIONAY
Vérena SANTER
Noémie SARAH
Daniel SCIARRA
Whitney SHATZ
Mayank SINGHAL
Lorenzo SPAGNUOLO
Francesca TESSARO
Vassily VOROBIEV
Julia WAGNER
Chantal WALTER
Etienne WEISSKOPF
Wenyuan XIONG
Marloes ZOEDEMELK
Vincent ZWICK

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Yvonne ARNOLD
Bobaly BALAZS
Ester BOIX GARRIGA
Gianpablo CHIRIANO
Paul COULERIE
Valentina D’ATRI
Sergio DEL RIO SANCHO
Carolina DOS SANTOS PASSOS
Amparo GARCIA LOPEZ
Victor GONZALEZ RUIZ
Alexandre GRAND-GUILLAUME
Hisham HAMED
Karolina JANIKOSWKA
Damei KE
Maria LAPTEVA
Viorica PATRULEA
Aurélie PERIAT
Marco RANDAZZO
Stéphanie ROMAND
Lionel SACCONAY
Omar SAKR
Cesar SERNA JIMENEZ
Daniel SPAGGIARI
Cédric THAUVIN
Narasimha UDA
Andreja VUIJICIC ZAGAR
Chen-Ying YANG

RESEARCH AUXILIARY

Sarah BRAITO (1.10.–31.12.2016)
Catherine DE HERDT (1.10.–31.12.2016)

CO-DIRECTIONS (CO-TUTELLES)

Akram FARHAT
Mélanie LELUBRE
Hanitra RAVEOJAONA

ACADEMIQUE STUDENT

Aline DELLICOUR (1.7.–31.10.2016)
Elsa OBERGFELL (1.10.–31.12.2016)
# Internship Students

Mohammad ABU DARWISH  
David ALVAREZ MARTINEZ  
Lucas ARAUJO  
Ken BROECKHOVEN  
Pierre-Éric CAMPOS  
Ilaria CIANCIBELLO  
Aline DELLICOUR  
Virginie HOUBART  
Céline LEMOINE  
Helena MANNOCCHIO RUSSO  
Thais MONTANHEIRO AMARAL  
Zahra MOTAMED  
Thanise NOGUEIRA FULLER  
Damien OLIVIER  
Yanfei PENG  
André ROCHAIX  
Bettina SCHWARZ  
Barbara THEILER  
Chiara TORTIA  
Gamze VARAN

# Administrative Staff

Valérie CAZORLA (until 31.3.2016)  
Nathalie CHIARAVOLI (since 1.4.2016)  
Danielle COOSEMANS  
Annick de MORSIER  
Nicole DECREY  
Nathalie GOFFIN (since 1.2.2016)  
Francisco MABIALA  
Elisa MASSON  
Elena ONATE  
Sylvia PASSAQUAY-RION  
Natalie SCHREGLE  
Dominique STORZ (until 31.5.2016)  
Florence VON OW  
Anne-Françoise WITTA (since 1.5.2016)  
Axelle WIRTHNER (commercial apprentice since 1.8.2014)

# IT Staff

Loris FRANCO  
Yann MANET  
Francisco MABIALA (auxiliary)

# Technical Staff

Aurélie BAGUET  
Said BENOHOUĐ  
Frédéric BORLAT  
Nathalie BOULENS  
Carole DUPRAZ  
Samuel ESPY (since 1.11.2016)  
Christophe FRANCEY  
Aurélie GOUILLER  
Sylvie GUINCHARD  
Tayeb JBILOU  
Béatrice KAUFMANN  
Sara LEONI (Since 1.6.2016)  
Laurence MARCOURT  
Arístea MASSARIΣ (since 1.12.2016)  
Xavier MEIJČ  
Jessica ORTELLI  
Ophélie PATTHEY  
Marco PERDIGAO  
Olivier PETERMANN  
Barbara PINHEIRO (since 15.7.2016)  
Emilie REGINATO  
Colette SAUTY  
Cédric SCHELLING  
Emmanuelle SUBLET
## BUDGET

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<td>OPERATIONAL BUDGET OF THE SECTION</td>
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### INVESTISSEMENT

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### EXTERNALS FUNDS

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### STAFF

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### PARTICIPATION OF ETAT DE VAUD

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<td>5 075 407</td>
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<td><strong>Total</strong></td>
<td>5 004 976</td>
<td>5 075 407</td>
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**Table 1**  
**Staff Salary CHF 11'712'254**

- Assistants and postdoctorals: 154 persons
- Technical and administrative staff: 45 persons
- Lecturers: 37 persons
- Professors: 18 persons

**Table 2**  
**Operational Budget of the Section CHF 1'180'411**

- Education budget: CHF 100'000
- Investment: CHF 745'255
- Operating budget TP: CHF 120'000
- Operating budget of Laboratories: CHF 912'411
- Operating budget of Administration section: CHF 50'000

**Table 3**  
**Total Investment Funds CHF 745'255**

**Table 4**  
**Total Public and External Funds CHF 4'939'950**

- FNRS: CHF 1'729'865
- Autres: CHF 3'210'085
- DIP: CHF 12'892'665
### TOTAL BUDGET CHF

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<tr>
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### TOTAL STUDENTS:

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<tr>
<td></td>
<td>439</td>
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<tr>
<td>- Bachelor</td>
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<tr>
<td>- Master</td>
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<td>- Master of advanced studies</td>
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### PH.D. STUDENTS

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### SCIENTIFICS ACTIVITIES 2016

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<td>Congress</td>
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<tr>
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<tr>
<td>Projects of collaboration with the industry</td>
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### EVENTS

During summer 2016, the EPGL moved in the CMU. This transfer mobilized all collaborators of the School during several months. The new building brings together under the same roof, several research groups of both Faculties of Sciences and Medicine. The new building offers a state of the art environment for education and research.

The inauguration took place on 24th November 2016, in presence of political, professional and societal stakeholders as well the public.

BIOPHARMACY

PROFESSOR GERRIT BORCHARD

GENERAL DESCRIPTION OF THE UNIT

The Biopharmaceutics group (FABIO) of EPGL in 2016 is a multidisciplinary and international group dedicated to the study of interaction of drugs and drug carrier systems with their biological environment, especially the immune system. Scientific projects include the physicochemical characterization of such drugs and carriers, the optimization of formulation methods, the establishment of cell based-assays, the utilization of suitable ex-vivo and in-vivo models, and translational research to allow for clinical testing. FABIO has gained expertise in the treatment and prevention of infectious diseases through its work on vaccines, and has accumulated considerable knowledge in interventional cancer therapy. The former line of research is dedicated to the development of particle-based vaccines, which are equipped with novel adjuvants addressing the innate immune system (e.g., Toll-like and NOD-like receptors). Work in cancer therapy is focused on a superparamagnetic iron oxide nanoparticle (SPIONs) based combined approach of heat induction and chemotherapy, and on chemoembolization using (biodegradable) beads loaded with anti-angiogenic drugs. In addition, a program on the elucidation of critical quality attributes (CQA) driving the biodeposition of iron carbohydrate nanoparticles has been continued in 2016. More fundamental work is done in the area of drug interaction with the (innate) immune system. Here, we are attempting to elucidate the mechanisms underlying the inflammatory and immune response to aggregates of therapeutic proteins, especially observed after subcutaneous injection (injection site reactions, ISR). We have also recently unraveled the interplay of epithelial tight junction regulation and ligation of receptors of the innate immune system (e.g., Toll-like receptors). The Biopharmaceutics group has access to all equipment necessary for the execution of the projects described above, either in-house or through cooperation within EPGL, the University of Geneva or with outside partners. It entertains a multitude of cooperative projects with academic institutions (basic research and clinical) as well as with industrial partners. Through the active participation in various learned societies and scientific committees, FABIO has the opportunity to shape the future of biopharmaceutical sciences and science policies.

SPECIFIC RESEARCH FIELDS

Nanomedicine(s)

The application of nanotechnology has expanded the approach to drug delivery decisively. The formulation of drugs into nano-scale delivery systems offers specifically the opportunity to enhance specific interactions of nanoscale systems with the specific tissue or cell affected by the targeted disease (“drug targeting”). In this context, we are currently executing the following projects
1. Targeting of prostate metastases
In the framework of a Swiss-wide Nanotera project we are developing superparamagnetic iron oxide nanoparticles (SPIONs), which are functionalized with an aptamer, small molecule and a mAb fragment directed against a prostate cancer antigen, PSMA. These nanoparticles aim at detecting cancer metastases by MR imaging and, ultimately, treat them through local hyperthermia. The project involves the particle synthesis, functionalization, physicochemical and in vitro characterization, and proof-of-concept in an animal model.
2. Enhancing healing of chronic wounds
Together with specialists in wound healing at the CHUV Lausanne (Pr. Lee-Ann Applegate), microbiology (Dr. Karl Perron, University of Geneva), and peptide dendrimer chemistry (Pr. Jean-Louis Reymond, University of Berne) we are developing biopolymers and nanoparticulate formulations, which are functionalized with cell-guiding RGD peptides and/or microbicidal peptide dendrimers. Having successfully performed in vitro tests, we are now moving into proof-of-concept studies in an appropriate animal model.
3. Identifying critical quality attributes of therapeutic nanoparticles

Linking physicochemical properties of therapeutic nanoparticles (“critical quality attributes”) to the clinical outcome achieved is currently an intensely discussed subject at the level of regulatory authorities, the pharmacopoeias and on a fundamental level. FABIO is contributing to this discussion, partially through interactions with the US Food and drug Administration (FDA) and the European Directorate for the Quality of Medicine (EDQM) by developing assays for the testing of iron carbohydrate nanoparticles. A special focus is thereby the comparison of the innovator drugs (reference listed drugs, RLDs) with their intended copies, or “nanosimilars”. Through these three project we are laying the basis for a more rational approach to the application of nanotechnology to drug delivery on the fundamental, clinical as well as the regulatory level.

2016 AT A GLANCE

<table>
<thead>
<tr>
<th>Category</th>
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<tr>
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<td>Books and chapters</td>
<td>2</td>
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<tr>
<td>Posters presentations</td>
<td>15</td>
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<tr>
<td>Congresses and symposia</td>
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<td>Patents</td>
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</tr>
</tbody>
</table>

STAFF

**SENIOR LECTURER**

Olivier JORDAN

**SENIOR RESEARCH ASSOCIATE**

Michael MÖLLER

**POSTDOCTORAL SCHOLARS**

Viorica PATRULEA

**RESEARCH AND TEACHING ASSISTANTS**

Stella EHRENBERGER

Tiziana DI FRANCESCO

Adrien DUVILLARD

Katrin FUCHS

Floriane GROELL

**INTERNSHIP STUDENTS — CO-SUPERVISION**

Sandra Cristina CAMPOS DE JESUS (university of Coimbra, Portugal)

Thais Larissa DO AMARAL MONTANHEIRO (university of Sao Paulo, Brazil)

**ADMINISTRATIVE STAFF**

Valérie CAZORLA (until 31.3.2016)

Valérie CAZORLA (since 1.5.2016)

**TECHNICAL STAFF**

Tayeb JBILOU

Emmanuelle SUBLET

Uptake of SPIONs functionalized with an anti-PSMA aptamer by androgen-sensitive human prostate adenocarcinoma cells (LNCaP) in vitro
RESEARCH FUNDS

SWISS RESEARCH PROGRAM

MAGNETOTHERANOSTICS
“From superparamagnetic nanoparticles until tools for the treatment of cancer” SNSF reference number: 20NA21_145919
Co-investigators: O. JORDAN
Total funding: CHF 393'500.--
Allocation 2016: CHF 100'700.--
Duration: 4 years
Starting date: 01.04.2013

NOVEL MICELLAR DRUG CARRIER SYSTEMS FOR GENE THERAPIES
SNSF reference number: 200021_157033
Co-Investigators: M. MOELLER, G. BORCHARD, A. Danani
Allocation 2016: CHF 95'000.--
Duration: 3 years
Starting date: 01.09.2015

INDUSTRY AND ASSIMILATED

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PUBLICATIONS

THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

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<tr>
<td>Biomaterials</td>
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<tr>
<td>Journal of Controlled release</td>
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<tr>
<td>Nanomedicine: Nanotechnology, biology and Medicine</td>
<td>5.72</td>
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<tr>
<td>Expert Opinion on Drug Delivery</td>
<td>5.65</td>
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<tr>
<td>Carbohydrate Polymers</td>
<td>4.81</td>
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<td>Molecular Pharmaceutics</td>
<td>4.44</td>
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<tr>
<td>European Journal of Pharmaceutics and Biopharmaceutics</td>
<td>4.15</td>
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<tr>
<td>Pharmaceutical Research</td>
<td>3.00</td>
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<tr>
<td>Journal of Pharmaceutical Sciences</td>
<td>2.71</td>
</tr>
<tr>
<td>Regulatory Toxicology and Pharmacology</td>
<td>2.22</td>
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</tbody>
</table>

SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)


**Scientific Publications (without impact factor)**


**Books Chapters**


PRESENTATIONS


7. T. DI FRANCESCO, L. DELAFONTAINE, G. BORCHARD. "Iron carbohydrate drugs case: are Maltofer® and their “generics” equivalent?”. GSRS16, Global Summit on Regulatory Science, Bethesda, MD, USA, September 7-9, 2016


11. V. PATRULEA, L.A. APPLEGATE, V. OSTAFE, O. JORDAN, G. BORCHARD, " Wound healing through nanocomplexes", Swiss Pharma Science Day 2016, August 31st, 2016 Bern (Switzerland)

12. V. PATRULEA, V. OSTAFE, L.A. APPLEGATE, G. BORCHARD, O. JORDAN, " Polyelectrolyte nanocomplexes based on chitosan derivatives for wound healing promotion ", The European Summit for Clinical Nanomedicine and Targeted Medicine (Clinam), June 26th-29th 2016 Basel (Switzerland)


14. V. PATRULEA, V. OSTAFE, L.A. APPLEGATE, G. BORCHARD, O. JORDAN. " Nanoparticles and gels based on new chitosan derivatives for wound healing promotion", 11th International Conference and Workshop on Biological Barriers (BioBarriers), March 7-9, 2016 Saarbrücken (Germany)

**CONGRESSES & SYMPOSIA**

1. **G. BORCHARD**, Nanocarriers for DNA vaccination against *M. tuberculosis* GPEN, University of Kansas, Lawrence KS, USA, November 2016.


10. **G. BORCHARD**, Regulation of epithelial permeability: Addressing the innate immune system. 11th International Conference and Workshop on Biological Barriers, Saarland University, Saarbrücken, Germany, March 2016.


**CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES**


THESIS PRESENTED

INTRA-MUROS THESIS

Katrin FUCHS,
*Anti-angiogenic strategies for chemoembolization of liver tumors*
University of Geneva
Thesis N° 5010, October 2016
Directors : G. BORCHARD and O. JORDAN,

EXTRA-MUROS THESIS

Sandra Cristina CAMPOS DE JESUS,
*Co-delivery of a pDNA hepatitis B vaccine with heat shock protein (Hsp) 70 using chitosan-based nanocarriers: Design of a mucosal formulation and mechanistic studies*
Cooperation with prof. Olga BORGES, University of Coimbra, Portugal,

PATENTS


AWARDS & DISTINCTIONS

3rd Poster Award, 9th Swiss Pharma Science Day, Berne, Switzerland, August 2016 (K. FUCHS).

Prize for the best master thesis in industry 2016 within the section of Pharmaceutical Sciences at the University of Geneva, awarded by the Swiss Society of Industrial Pharmacists (SSIP) (Albulena Lutfija).
IMMUNOPHARMACOLOGY OF CANCER

PROFESSOR CAROLE BOURQUIN (SINCE 1.8.2016)

GENERAL DESCRIPTION OF THE UNIT

Our overall aim is to develop novel treatments to enhance the body’s immune defenses against cancer. Our research aims first at uncovering new mechanisms leading to activation of the immune system, for example during viral infections. Using this bioinspiration, our goal is to develop pharmacological ways to stimulate anticancer immunity. We are currently working on the following questions:

- What is the early sequence of immune activation during a viral infection? How can we reproduce this sequence pharmacologically?
- How do virally-derived components, such as Toll-like receptor ligands, activate anti-cancer immunity and decrease cancer-associated immunosuppression?
- Can we enhance migration of effector T cells into the tumor with virally-derived components?
- Can we use nanoparticles as delivery system to focus their action and prevent unwanted side effects?

SPECIFIC RESEARCH FIELDS

Impact of virally-derived components in anti-tumoral immune responses and lymphocyte migration
Design of tumor-targeted immunostimulatory nanoparticles (TiNaps)
Tumor and immune cell metabolism: their interplay for the development of tumor-related immune responses

2016 AT A GLANCE

<table>
<thead>
<tr>
<th>Publication with impact factor</th>
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<tbody>
<tr>
<td>Posters presentations</td>
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<td>Awards</td>
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</table>
STAFF

POSTDOCTORAL SCHOLARS
Narasimha Rao UDA
Chen-Ying YANG

RESEARCH AND TEACHING ASSISTANTS
Sandra HOCEVAR
Inès MOTTAS
Jean-Baptiste PIGNIER
Lorenzo SPAGNUOLO
Julia WAGNER

MASTER STUDENTS
Alessandra CEREGHETTI

ADMINISTRATIVE STAFF
Nathalie CHIAVAROLI

TECHNICAL STAFF
Aristea MASSARAS

RESEARCH FUNDS

SWISS NATIONAL SCIENCE FOUNDATION

“Understanding the interaction of nanoparticles with B lymphocytes in vitro and in vivo”. 310030_156871/1
Main applicant: C. BOURQUIN
Co-applicant: M. Clift, University of Wales
Total funding: CHF 397’000.--
Allocation 2016: CHF 105’000.--
Duration: 3 years
Starting date: 2015

SWISS NATIONAL SCIENCE FOUNDATION

“RLR/TLR combination therapy: Mechanisms of T-cell recruitment into gastric tumors” 310030_156372/1
Main applicant: C. BOURQUIN
Total funding: CHF 550’000.--
Duration: 3 years
Starting date: 2015

NATIONAL CENTER OF COMPETENCE IN RESEARCH – BIO-INSPIRED MATERIALS

“Controlled activation of cancer-associated immune cells by stimuli-responsive nanoparticles”
Main applicant: Ch. Weder
Total funding (BOURQUIN project): CHF 295’000.--
Allocation 2016: CHF 73’750.--
Duration: 4 years
Starting date: 2014

HORIZON 2020 MARIE SKŁODOWSKA-CURIE ACTION INNOVATIVE TRAINING NETWORK

“IMMUTRAIN - Training Network for the Immunotherapy of Cancer”. Grant Agreement n° 641549 (Swiss participation funded by SEFRI to C. BOURQUIN)
Coordinator: Ludwig-Maximilians-Universität München
Co-applicants: Stichting Katholieke Universiteit, The Netherlands, Roche Diagnostics, Germany, The Nottingham Trent University, United Kingdom, Istituto Europeo di Oncologia, Italy, Medizinische Universität Innsbruck, Austria, Fundacion Centro Nacional de Investigaciones Oncologicas Carlos III, Spain, Region Hovedstaden, Denmark, Institut Gustave Roussy, France, Université de Genève, Switzerland
Total funding (BOURQUIN project): CHF 334’310.--
Allocation 2016: CHF 167’155.--
Duration: 4 years
Starting date: 2015
PUBLICATIONS

THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

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<td>Nature Immunology</td>
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<td>Immunity</td>
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<td>Clinical Cancer Research</td>
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<td>Cancer Immunology Research</td>
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<td>OncoTarget</td>
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<td>Journal of Immunology</td>
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SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)


PRESENTATIONS

POSTERS PRESENTATIONS


**CONGRESSES & SYMPOSIA**

1. C. BOURQUIN: “Immunostimulation for cancer therapy: timing is everything” German Pharm-Tox Summit 2016, Berlin (Germany).

2. C. BOURQUIN: “Reprogramming innate immune signalling to improve cancer immunotherapy”, Immunofest 2016, Munich (Germany).


**THESIS PRESENTED**

**Thesis Jury**

Christoph WYSS  
“Cellular and Molecular Mechanisms of Breast Cancer Metastasis to the Brain”  
Supervisor: Prof. C. Rüegg, University of Fribourg,  
Jury member: C. BOURQUIN
AWARDS & DISTINCTIONS

L. SPAGNUOLO: Travel grant award, 14th CIIMT Annual Meeting, 10-12 May 2016, Mainz (Germany).


The group focuses its activities on separation techniques mainly liquid chromatography (LC), capillary electrophoresis (CE) and supercritical fluid chromatography (SFC) coupled with various detectors, including mass spectrometry (MS) for the analysis and bioanalysis of pharmaceutical and biopharmaceutical compounds. New chromatographic supports and sample preparation approaches are evaluated and original strategies to gain selectivity and/or sensitivity of the analytical process are developed. Reduction of the total analysis time is also studied. Special focus is given to environmentally friendly analytical techniques (green chemistry). The research of this group also focuses on the development and the use of methods for mathematical and statistical analysis of data produced from chemical instrumentation. The use of chemometric tools for developing analytical methods, determining optimized or robust conditions, as well as for analyzing data with pattern recognition techniques are applied in many projects within the School of Pharmaceutical Sciences and numerous external academic and/or industrial collaborations. Three main fields are currently developed, namely Design of experiments (DOE), method validation, and data mining (exploratory data analysis). For the latter, numerous important collaborations are under progress, particularly in the field of metabolism, metabolomics, and toxicology.

Research areas consist in:
- pharmaceutical and drugs of abuse analysis
- doping substances analysis
- chiral separation of pharmaceutical products
- study of the impact of sample preparation procedures in the analytical process
- characterization of large biomolecules (proteins, mAbs, ADC’s)
- biomedical analysis
- drug metabolism
- affinity chromatography
- UHPLC, CE and SFC
- separation techniques
- screening method for metabolomic purpose
- data mining

Specific research fields:
- Liquid chromatography (LC)
- Capillary electrophoresis (CE)
- Supercritical fluid chromatography (SFC)
- Hyphenation to mass spectrometry (MS)
- Validation
- Sample preparation
- Chemometrics
- Toxicology
- Metabolomics
2016 AT A GLANCE

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<td>Awards</td>
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STAFF

**Senior Lecturer**
Davy GUILLARME

**Lecturer**
Julie SCHAPPLER

**Visiting Professors**
Ken BROEKHOVEN
Frédéric ZENHAUSERN

**Excellence Fellowship**
Virginie HOUBART

**Senior Research Associate**
Julien BOCCARD
Fabienne JEANNERET
Szabolcs FEKETE

**Senior Research Associate**
Aline DELLICOURT

**Postdoctoral Scholars**
Balazs BOBALY
Valentina D’ATRI
Victor GONZALEZ-RUIZ
Alexandre GRAND-GUILLAUME PERRENOUD

**Research and Teaching Assistants**
Vincent DESFONTAINE
Alexandre GOYON
Nicolas DROUIN
Stéphanie ROMAND
Yoric GAGNEBIN
Julian PEZZATI

**Internship Students – Co-Supervision (co-tutelle)**
Leire AZURMENDI
Linnéa LAGERSTEDT
El-Hadji Assan DIOP
Niloufar MARSOUSI
Nicola GUICHARD
Federico PONZETTO
Ameena JESAIMANI

**Administrative Staff**
Nicole DECREY
Sylvia PASSAQUAY

**Technical Staff**
Christophe FRANCEY
Emilie REGINATO
Etienne JACOT-DESCOMBES
Cédric SCHELLING

(apprentice laborant)
RESEARCH FUNDS

SCAHT

Swiss Center for Applied Human Toxicology (SCAHT). An untargeted steroidomic approach for toxicological studies. In core project: Endocrine disruptors and steroid modulation.
Main Applicant: S. RUDAZ
Total funding: CHF 570'000.-
Allocation 2016: CHF. 190’000.-
Duration: 3 years
Starting date: 01.01.2014

Method development for the analysis of small polar metabolites as key event for the adverse outcome neuroinflammation.
Main Applicant: S. RUDAZ
Total funding: CHF 63’470.

NESTLE

Evaluation of SFC for the characterization of natural products.
Main applicant: J.-L. VEUTHEY
Co-applicant: Dr. D. GUILLARME
Total funding: CHF 657’956
Allocation 2016: CHF 180’778
Duration: 3 years
Starting date: 01.09.2014

FIRMENICH

Main applicant: J.-L. WOLFENDER
Co-applicant: S. RUDAZ
Total funding: CHF 158’000
Allocation 2016: CHF 130’000
Duration: 3 years
Starting date: 01.01.2015

FNRS

Improving the analytical strategies for the characterization of monoclonal antibodies, biosimilars and antibody-drug conjugates.
Main applicant: D. GUILLARME
Co-applicant: J.-L. VEUTHEY
Total funding: CHF 441’600.-
Allocation 2016: CHF 147’200.
Duration: 3 years
Starting date: 11.01.2016

INDUSTRY AND ASSIMILATED

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<td>Service – analytical investigations and dosages</td>
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DEVICES IN LEND

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<td>APPI Spray Chamber (50'000 Chf.)</td>
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PUBLICATIONS

THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

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<th>Journal</th>
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<td>Sciences. Rep</td>
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<tr>
<td>Analytica Chimica Acta</td>
<td>4.51</td>
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<tr>
<td>Analyst</td>
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<td>J. Chromatography A</td>
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<td>Eur. J. Pharm. Sci.</td>
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<td>J. Nat. Prod.</td>
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<td>Toxcol. Letters</td>
<td>3.52</td>
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SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)


**Scientific Publications (without impact factor)**


**Books or Book Chapters**


**Presentations**

**Posters presentations**


15. N. DROUIN, S. RUDAZ, J. SCHAPPLER. Extraction of polar metabolites from CSF by electromembrane extraction. 32nd International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake, Canada.


23. N. DROUIN, J. SCHAPPLER, S. RUDAZ. Electromembrane extraction for cationic metabolome analysis. Symposium on Separation Sciences, 8-9 June 2016, Copenhagen (Danemark).


29. N. DROUIN, S. RUDAZ, J. SCHAPPLER. Electromembrane extraction for cationic metabolome analysis. Symposium on Separation Sciences, 8-9 June 2016, Copenhagen (Denemark).


41. N. DROUIN, S. RUDAZ, J. SCHAPPLER. Electromembrane extraction for the sample preparation of scarce biofluids: application to polar cationic metabolites. 27th International Symposium on Pharmaceutical and Biomedical Analysis (PBA 2016), 13-16 November 2016, Guangzhou (China).


Oral Presentations


<table>
<thead>
<tr>
<th>No.</th>
<th>Authors</th>
<th>Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td>J. BOCCARD.</td>
<td>Advanced Chemometric Methods for MS-based Metabolomics.</td>
<td>Métabolomique: Outils et méthodologie, 4-6 April, 2016, Clermont-Ferrand (France).</td>
</tr>
<tr>
<td>22.</td>
<td>N. DROUIN, S. RUDAZ, J. SCHAPPLER.</td>
<td>Analysis of scarce biofluids: electromembrane extraction and capillary electrophoresis coupled to mass spectrometry are a good match.</td>
<td>Symposium on Separation Sciences, 8-9 June 2016, Copenhagen (Denmark).</td>
</tr>
<tr>
<td>27.</td>
<td>V. DESFONTAINE, L. NOVAKOVA, F. PONZETTO, R. NICOLI, M. SAUGY, J.L. VEUTHEY, D. GUILLARME.</td>
<td>UHPLC-MS/MS and UHPSFC-MS/MS as alternative techniques to GC-MS/MS for the rapid screening of anabolic agents in urine.</td>
<td>ISC 2016, 28 August – 1 September 2016, Cork (Ireland).</td>
</tr>
<tr>
<td>30.</td>
<td>NICOLAS DROUIN, SERGE RUDAZ, JULIE SCHAPPLER.</td>
<td>Analysis of polar metabolites by CE-MS/MS.</td>
<td>Agilent User-Meeting, November 2016, Lausanne (Switzerland).</td>
</tr>
<tr>
<td>32.</td>
<td>S. RUDAZ.</td>
<td>Metabolomic approach for steroid analysis in toxicological studies.</td>
<td>27th International Symposium on Pharmaceutical and Biomedical Analysis, 13-16 November, 2016 Guangzhou (China).</td>
</tr>
</tbody>
</table>


**CONGRESSES & SYMPOSIA**

1. HTC 14, January 2016, Ghent (Belgium).
6. 34th Cologne Workshop on Dope Analyses, Cologne, Germany, February 21-26, 2016.
7. Pittcon congress – March 2016, Atlanta (USA).
9. 32nd International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).
10. FoodIntegrity 2016, 6-7 April 2016, Prague (Czech Republic).
11. 10èmes Journées Scientifiques du Réseau Français de Métabolomique et Fluxomique, May 30-June 2, 2016, Montpellier (France).
13. ASMS – San Diego, USA, 5-9 June 2016, San Diego (USA).
17. 9th Joint Natural Products Conference, 25-27 July, 2016, Copenhagen (Denmark).
19. Swiss Pharma Science Day 2016, August 2016, Berne (Switzerland).
20. Eurotox 2016, 4-7 September, 2016, Seville (Spain).
22. SFC 2016 – 5-7 October, 2016 Vienna (Austria).
24. 27th Int. Symposium on Pharmaceutical and Biomedical Analysis, 13-16 November 2016, Guangzhou (China).
26. SCAHT Retreat, 1-2 December, 2016, Neuchâtel (Switzerland).

CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

3. J. SCHAPPLER. Master “Contrôle et Analyse”, University Claude Bernard Lyon 1, Lyon, France. Validation des méthodes analytiques (12h); in the course: Qualification et validation. January 2016, Lyon (France).
4. S. RUDAZ. Untargeted is the Target. Department of Physiology, University of Lausanne, February 1, 2016, Lausanne (Switzerland).
5. S. RUDAZ. Untargeted Analysis, from raw data to biomarkers* Inauguration of the Faculty Centre of Translational Investigation in Biomarkers – 1st Biomarker Day, University of Geneva, March 6th, 2016, Geneva (Switzerland).
6. D. GUILLARME. Introduction à la chromatographie en phase liquide (HPLC) (1 day). CCCTA course, March 2016, Geneva (Switzerland).
7. J. SCHAPPLER, S. RUDAZ. Validation des méthodes analytiques (12h). CCCTA, March 2106, Geneva (Switzerland).
11. D. GUILLARME. Choix technologiques et développement de méthodes en HPLC (2 days). CCCTA course, April 2016, Geneva (Switzerland).
15. S. RUDAZ, J. BOCCARD. Initiation aux méthodes d’analyse multivariée en sciences pharmaceutiques. School of Pharmaceutical Sciences doctoral program, 11-12 April, 2016, Geneva (Switzerland).
S. RUDAZ. Pratique des plans d’expérience, une introduction. Université Cheikh Anta Diop, 29 April – 7 May, 2016, Dakar (Sénégal).

S. RUDAZ. Validation des méthodes analytiques. Université Cheikh Anta Diop, 29 April – 7 May, 2016, Dakar (Sénégal).


S. RUDAZ. Intérêt et défi du profil stéroidien. Journée afabs, Formation continue en Biologie Spécialisée, Méthodes “omics” en médecine de Laboratoire, intérêt d’une approche globale, 12 May, 2016, Montreux (Suisse).


S. RUDAZ. Human key event readouts related to male infertility and Steroidomic profiling in adrenal cell models. 5th SCAHT Science Advisory Board Meeting, July 5-6, 2016, Bern (Switzerland).

J. BOCCARD, S. RUDAZ. Metabolomic profiles induced by neuroinflammatory conditions. 5th SCAHT Science Advisory Board Meeting, July 5-6, 2016, Bern (Switzerland).

S. RUDAZ. Contrefaçons médicamenteuses: le projet Pharmelp. Formation continue EPGL / PharmaGenève, 27 September, 2016, Geneva (Switzerland).


S. RUDAZ. Low cost capillary electrophoresis system for counterfeits detection. Recent events in energy seminar series, EPFL Valais, 3 November, 2016, Sion (Switzerland).


INTRA-MUROS THESIS

Lionel SACCONNAY.
In silico-driven strategies for the identification of novel sirtuin modulators
University of Geneva - 2016
Thesis N° 4904
Directors: P.-A. CARRUPT, J.-L. VEUTHEY, A. NURISSO

Ameena JESAIMANI.
The use of Internet for health information by hospitalized patients in Switzerland and Qatar.
University of Geneva – 2016 –
Thesis N° 4920
Directors: P. DAYER, J.-L. VEUTHEY.
Stéphanie ROMAND.
Nouvelles approches in vitro pour l’étude de la physico-chimie et du métabolisme de phase II de composés pharmaceutiques.
University of Geneva – 2016 –
Thesis N° 4975
Directors: P.-A. CARRUPT, S. RUDAZ

THESIS JURY

Myriam MORGATTA.
Master of Advanced Studies in Toxicology.
What is known on disinfectants used in hospitals and potentially released in wastewaters?
The case of two Swiss university hospitals.
Scientific direction: Dr. N. Chèvre, Lausanne University, Switzerland.
Jury member: S. RUDAZ

Lionel SACCONAY.
PhD.
In silico-driven strategies for the identification of novel sirtuin modulators.
Scientific Direction: J.-L. VEUTHEY, P. A. CARRUPT, A. NURISSO, Geneva University, Switzerland.
Jury member: S. RUDAZ

Miguel DE FIGUEIROS.
PhD.
First year qualification for Ph.D. thesis Évaluation de la contribution des methods chimiométriques pour l’inférence de source et la comparaison de profils chromatographiques de liquids inflammmables.
Jury member: S. RUDAZ

Emmanuelle BICHON.
PhD.
Scientific direction: Prof. B. Le Bizec, Laberca, University of Nantes (France).
Jury member: S. RUDAZ

Benjamin THIOMBIANO.
PhD.
Étude du métabolisme des phénylpropanoides au cours de la germination de la graine de lin.
Scientific direction: R. Dauwe, F. Mesnard, University of Picardie, Amiens (France).
Jury member: S. RUDAZ

François LESTREMEAU.
HDR
Evaluation et développement de méthodologies analytiques pour la mesure de composés organiques dans le domaine de l’environnement et de la santé.
Scientific direction: H. Budzinski, University of Bordeaux (France).
Jury member: D. GUILLARME

Yannis N. FRANCOIS.
HDR.
Développement du couplage électrophorèse capillaire – spectrométrie de masse: applications à la caractérisation fine de protéines.
Scientific direction: E. Leize-Wagner, University of Strasbourg (France).
Jury member: D. GUILLARME
Vincent ZWICK.
PhD.
HDAC inhibitors from natural and synthetic libraries: towards the development of biochemical probes.
Scientific direction: M. CUENDET, P-A. CARRUPT, University of Geneva.
Jury member: J.-L VEUTHEY

Morgan SARRUT.
PhD.
Optimisation de méthodes bidimensionnelles en ligne LCxLC-UV/MS et LCxSFC-UV pour l'analyse d'échantillons complexes.
Scientific direction: S. Heinisch, University Claude Bernard.
Jury member: J.-L VEUTHEY

Mélanie MIGNOT.
PhD.
Elaboration de phases stationnaires originales pour la chromatographie liquide haute performance: synthèse, caractérisation, et évaluation des propriétés chromatographiques des colonnes.
Scientific direction: V. Peulon-Agasse, P. Cardinael, University of Rouen.
Jury member: J.-L VEUTHEY

Amandine DISPAS.
PhD.
Supercritical fluid chromatography for pharmaceutical analysis: new perspectives.
Scientific direction: Ph. Hubert, University of Liège.
Jury member: J.-L VEUTHEY

Anthon HEEMSKERK.
PhD.
Exploring the proteome by CE-ESI-MS.
Jury member: J. SCHAPPLER

RADIO TELEVISION INTERVENTION

Julie SCHAPPLER.
PharmaShow, AESP. 1st November 2016.

AWARDS & DISTINCTIONS

F. MEHL, F. PONZETTO, R. NICOLI, N. BAUME, M. SAUGY, J. BOCCARD, S. RUDAZ. Award for excellence in poster presentation, 1st prize.

F. JEANNERET, J. SANDSTRÖM VON TOBEL, J. BOCCARD, F. MONNET-TSCHUDI, S. RUDAZ. Outstanding posters selected for oral presentation.

N. DROUIN, S. RUDAZ, J. SCHAPPLER. Best poster award, MSB 2016
Dynamic electromembrane extraction (d-EME): a new technical development 32nd International Symposium on Microscale Separations and Bioanalysis (MSB 2016), 3-7 April 2016, Niagara-on-the-Lake (Canada).


E.A. DIOP, E. REGINATO, C. ROHRBASSER, P. BONNABRY, S. RUDAZ, J. SCHAPPLER. Swiss Academy of Pharmaceutical Sciences - Award for excellence in poster presentation Prize, 1st price. Low-cost capillary electrophoresis for counterfeits detection and sub-standard drugs quality control. 9th Swiss Pharma Science Day, 31 August 2016, Bern (Switzerland).


J. SCHAPPLER, E. A. DIOP, E. REGINATO, C. ROHRBASSER, P. BONNABRY, S. RUDAZ. 2016 Award for excellence in poster presentation Prize, 3rd price (ex-aequo). Development of a low-cost analytical strategy for the detection of counterfeits and sub-standard medicines in emerging countries. 27th Int. Symposium on Pharmaceutical and Biomedical Analysis, 13th to 16th November, 2016 Guangzhou (China).

GENERAL DESCRIPTION OF THE UNIT

The Pharmaceutical Biochemistry group includes two distinct fields of research linked to molecular therapeutics discovery and delivery. The first is the Pharmaceutical Biochemistry/Chemistry field in which the research is focused on understanding ligand-macromolecule interactions to develop new therapeutic strategies including new chemical entities, new targets using an interdisciplinary approach based on the combination of Biochemistry/Biophysics and Chemistry with Computational Chemistry/Molecular Modelling. Additionally an in vivo activity in the field of rare disease has been added in order to be able to do preclinical Proof of Concept. The second is in the field of drug delivery and focuses on the topical and transdermal delivery of therapeutic agents by investigating the effect of molecular properties on both passive and active transport processes. In addition, innovative approaches to increase the range of therapeutic agents that can be delivered across the skin and so provide new treatment options are also investigated.

SPECIFIC RESEARCH FIELDS

The research in the field of pharmaceutical biochemistry/chemistry covers three main topics, namely Cancer, Neglected Diseases, Rare Diseases and Antibiotics Research.

- In Cancer Research we have two main objectives, namely the development of a thymidine kinase based safety and monitoring tool for stem cells therapy and the development of inhibitors of the tyrosine kinase domain of oncogenic fusion proteins involved in signalling pathways.
- Within the research area of Neglected Diseases and Rare Diseases we aim at elucidating and validating new potential drug targets for developing therapeutic strategies against orphan diseases e.g. dystrophy/SMA and the major parasitic diseases of the Third World e.g. Malaria, Tripanosomiasis and Leishmaniosis as well as finding potential lead compounds against such diseases.
- Within the area of Antibiotic Research the objective is to find compounds inhibiting bacterial virulence with novel mechanisms of action.

Further minor activities based on molecular recognition-based approaches for improving antibody formulation are ongoing.

The research in the field of cutaneous drug delivery includes:

- Development of new formulations to increase local and systemic bioavailability of topical and transdermal therapeutics.
- Investigation of the influence of physicochemical properties on electrically-assisted transport across the skin.
- Synthesis and characterisation of prodrugs optimised for transdermal iontophoretic administration.
- Development of new techniques for the non-invasive delivery of biotechnology-derived therapeutics across the skin (“pharmaceutical biotechnology”).
- Evaluation of dermal exposure, risk assessment and the development of predictive mathematical models.
- Investigation of new therapeutic applications.
2016 AT A GLANCE

<table>
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<tr>
<th>Publications with impact factor</th>
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<td>Ph.D. Thesis presented in 2016</td>
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STAFF

**SENIOR LECTURER**
- Remo PEROZZO

**SENIOR RESEARCH ASSOCIATE**
- Olivier DORCHIES
- Thibaut De SMEDT
- Béatrice KAUFMANN
- Oscar VADAS

**SENIOR RESEARCH AND TEACHING ASSISTANTS**
- Laurence NEFF
- Sébastien TARDY
- Magali ZEISSER

**POSTDOCTORAL SCHOLARS**
- Yvonne ARNOLD
- Maria LAPTEVA
- Sergio DEL RIO SANCHO
- Cesar Serna JIMENEZ
- Amparo GARCIA LOPEZ
- Andréja VUJICIC ZAGAR
- Hesham HAMED

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- Chiara AMBUÉHL
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- Naoual DAHMANA
- Francesca TESSARO
- Elinam GAYI
- Mayank SINGHAL
- Si GOU
- Vegunta YOGHESH
- Somnath KANDEKAR
- Tyagi VASUNDHARA

**INTERNSHIP STUDENTS – CO-SUPERVISION (CO-TUTELLE)**
- Laura CURTI
- Cecilia DALLAVALLE
- Giuseppina PISIGNANO
- Withney SHATZ

**ADMINISTRATIVE STAFF**
- Nathalie GOFFIN

**TECHNICAL STAFF**
- Aurélie BAGUET
- Ophélie PATTHEY-VUADENS
- Samuel EPSY (apprentice)
- Olivier PETERMANN
- Sylvie GUINCHARD
- Barbara PINHEIRO
- Aurélie GOUILLER
- Valentina RIGAUD (apprentice)
- Benjamin KIENNING (apprentice)
- Djehna SCALDINO (apprentice)
- Mathias YOBOUET (apprentice)
- Samuel EPSY (apprentice)
**RESEARCH FUNDS**

**Swiss National Science Foundation**

How kinases define specificity in lipid signalling? (SNF PZ00P3_148269/1 Ambizione)
Main applicant: O. VADAS  
Co-applicant: L. SCAPOZZA  
Total funding: CHF 600’000.-  
Allocation 2016: CHF 195’410.-  
Duration: 3 years  
Starting date: 1.1.2014

**EU FUNDING**

Scaffolds for alternative delivery (SADEL) (FP7-HEALTH-2011)
Main applicant: L. SCAPOZZA  
Total funding: Euro 643’544.-  
Allocation 2016: CHF 0.-  
Duration: 5 years  
Starting date: 1.1.2012

**CTI**

CTI-19086.1 PFLS.LS: “Spironolactone-Apidol formulation for delayed healing of minor wounds in glucocorticoid treated patients”  
Main applicant: Y. KALIA  
Total funding: CHF 105’033.-  
Allocation 2016: CHF 63’020.-  
Duration: 2 years  
Starting date: 1.7.2016  

CTI-18283.1 AIDD-A2A: “ADENOSINE A2A receptor positive allosteric modulators (PAM) as a novel broadly applicable oral anti-inflammatory therapy”  
Main applicant: L. SCAPOZZA  
Total funding: CHF 219’248.-  
Allocation 2016: CHF 155’404.- + AIDD : CHF 24’992.-  
Duration: 1 year  
Starting date: 1.1.2016

**FOUNDATIONS**

Main applicant: L. SCAPOZZA  
Total funding: CHF 124’209.-  
Allocation 2016: CHF 65’746.-  
Duration: 2 years  
Starting date: 1.1.2015

Investigations on tamoxifen and the roles of estrogen receptors in mouse models of muscular dystrophies. Foundation DPP-NL  
Main applicant: L. SCAPOZZA and O. Dorchies  
Total funding: CHF 263’237.-  
Allocation 2016: CHF 70’387.-  
Duration: 2.5 years  
Starting date: 1.7.2014
Enhancing estrogenic signalling to fight devastating muscular dystrophies: Mechanisms of action and repurposing estrogenic drugs approved for Human use. Foundation AFM-Téléthon
Main applicant: L. SCAPPOZZA and O. Dorchie
Total funding: CHF 159'570.-
Allocation 2016: CHF 0.-
Duration: 3 years
Starting date: 1.9.2014

Protective effects and mechanisms of action of tamoxifen in mice with severe muscular diseases. Fondation Suisse de recherché sur les maladies musculaires
Main applicant: L. SCAPPOZZA and O. Dorchie
Total funding: CHF 195'780.-
Allocation 2016: CHF 63'880.-
Duration: 2 years
Starting date: 1.1.2014

### Industry and Assimilated

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### Devices in Lend

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<td>FDSS / microcell - Hamamatsu</td>
<td>Alpine Institute for Drug Discovery SA / Institut for Arthritis Research</td>
<td>01.09.2014-</td>
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### Publications

#### The Top Ten Journals in the Field (with Impact Factor)

- Cancer Res.: 7.86
- J. Biol. Chem.: 4.77
- J. Med. Chem.: 5.25
- Cancer Gene Ther.: 2.80
- Proteins: 3.39
- Biochemistry-US: 3.42
- Protein Sci.: 2.80
- Protein Expres. Purif.: 1.59
- J. Mol. Model: 1.80


* L Scapozza co-director of the thesis at EPGL

* L Scapozza co-director of the thesis at EPGL


* Y Kalia co-director of the thesis at EPGL


PRESENTATIONS

POSTERS PRESENTATIONS


5. H. M. ISMAIL, O. M. DORCHIES, A. SLADE, F. PORTE-THOME, L. SCAPPOZZA. Rimeporide restores resting pH and decreases store operated calcium entry in dystrophic myotubes by inhibiting sodium hydrogen exchanger type 1 (NHE 1) Swiss Society of Pharmacology and Toxicology annual meeting, Bern, Switzerland, April 21st 2016

6. C. DALLAVALLE, G. THALMANN, C. V. CATAPANO, G. M. CARBONE. The E3 ubiquitin ligase COP1 controls STAT3 turnover and its loss leads to increased STAT3 stabilization and activation in prostate cancer-AACR, New Orleans, April 16-20, 2016


13. V. SANTER, S. DE RIO SANCHO, Y. N. KALIA. Iontophoresis of triamcinolone acetonide amino acid ester prodrugs for increased intracorneal drug biodistribution, 30ème Seminaire en Sciences Pharmaceutiques, Molecular Therapeutics-Discovery, Development and Delivery, Zermatt, Switzerland, September 5-9, 2016.


**CONGRESSES & SYMPOSIA**

1. S. G. KANDEKAR Nanocarrier mediated topical delivery of vismodegib: a targeted approach for the treatment of basal cell carcinoma, 30ème séminaire en sciences pharmaceutiques, Molecular Therapeutics – Discovery, Development and Delivery, Zermatt, Switzerland, September 5 - 9, 2016


4. W. SHATZ. Developing Protein-polymer Conjugates as a Candidate for Long Acting Delivery to the Eye, PEGS, Boston, USA, April 2016

5. W. SHATZ. Developing a Protein-polymer Conjugate as a Candidate for Long Acting Delivery to the Eye, Molecular Therapeutics Offsite, Zermatt, Switzerland, September 2016


7. O. VADAS. Structural insights into phosphoinositide 3-kinases (PI3Ks) regulation" LS2 meeting, Lausanne, February 15-16, 2016

8. O. VADAS. Class II phosphoinositide 3-kinases (PI3Ks) regulation and cellular functions: from protein to cell" ERC starting grant selectioin, Bruxelles (Belgium), June 7, 2016

9. H. M. ISMAIL. Therapeutic effectiveness of Rimeporide, an NHE-1 inhibitor, from muscle cells in culture to models of Duchenne muscular dystrophy, 11th Swiss Meeting on Muscle Research, Macolin, Switzerland 22nd November 2016


15. Y. N. KALIA. Drug delivery into and across the skin: The art of the possible. Shanghai Jiao Tong University, Shanghai, China May 23, 2016.


17. Y. N. KALIA. Crossing biological barriers, 30ème Séminaire en sciences pharmaceutiques, Zermatt, Switzerland, September 5-9, 2016


CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. L. SCAPOZZA. Co-organizer of the Symposium entitled “Fortschritte in der Pharmakologie: Personalized Medicine” (ca 300 participants) January 28, 2016, Bern (Switzerland)

2. L. SCAPOZZA, O. STAUB. Organisation of the SSEP symposium within the LS2 Annual meeting entitled “Pharmacology in the era of System Biology” (ca 300 participants) February 15-16, 2016, Lausanne (Switzerland)
Laura CURTI
“EZH2 induces methylation of ERG enhancing its transcriptional and transforming activity”
Thesis n° 4913, University of Geneva
Director: L. SCAPozza
Co-director: G. CARBONE
March 11, 2016

Cecilia DALLAVALLE
“A novel oncogenic axis involving the ETS factor ESE3/EHF, miR-424, COP1 and STAT3 drives prostate tumor progression.”
Thesis n° 4950, University of Geneva
Director: L. SCAPozza
Co-director: G. CARBONE
July 4, 2016

Giuseppina PISIGNANO
“A non-coding RNA network influenced by genetic polymorphism controls E-cadherin expression in human cancers”
Thesis n° 5037, University of Geneva
Director: L. SCAPozza
Co-director: C. CATAPANO
December 7, 2016
**Phytochemistry and Bioactive Natural Products**

**Professor Jean-Luc Wolfender**

**General Description of the Unit**

The main research activities of the unit are related to the development of methodologies for the rapid isolation, identification, and bioactivity characterisation of natural products (NPs) at the microgram scale. State-of-the-art LC-MS and LC-MS/MS as well as microNMR techniques are used for dereplication purposes or de novo identification of NPs in crude extracts from different origins (plants, fungi, and microorganisms). Microfractionation methods in 96 well plates allow bioassays to be performed on LC peak in crude extracts, quantitative estimation of the well content and further structural determination by CapNMR. Rational large-scale isolation strategies are developed for the rapid obtention of pure NPs in the mg scale for further testing bioactivities and mode of action. The range of biological activities studied in house or in collaboration covers mainly antifungal, antiprotozoal, antiinflammatory and antiepileptic activities. The interest of the group is also focused on plant metabolomics, in this respect the focus is on the investigation of bioactive NPs dynamically induced in various stress situations (fungi confrontation, biotic and abiotic stresses, metabolite elicitation). With the idea to generate original sources of bioactive NPs, other strategies including biotransformation or chemical derivatisation of crude extracts from common sources are also investigated. Finally, the analytical and metabolomics methods are also used for studying the metabolism of crude extracts in view of a better understanding of the mode of action (synergy, prodrugs) and the potential toxicity of phytopharmaceuticals or nutraceuticals.

**Specific Research Fields**

- Search for new lead compounds from natural sources
- On-line identification of natural products by LC-UV-NMR-MS (dereplication)
- Rapid microfractionation of crude extracts for chemical and bioactivity profiling
- Plant metabolomics
- Search for original bioactive stress-induced natural products of various origin
- Study of antifungal compounds from pathogen fungi in co-culture
- Qualitative quantitative analysis of phytotherapeuticals
- Study of the metabolisation of phytopreparation by metabolomics in relation with their mode of action
- Investigation of natural products involved in diseases associated with problems of ageing
- Search for new lead compounds for use against tropical parasitic diseases
- Investigation of methods for isolation of natural products using preparative chromatographic techniques

**2016 at a Glance**

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STAFF

VISITING PROFESSOR
Miwa DOUNOUE

SENIOR LECTURER
Emerson FERREIRA QUEIROZ

LECTURER
Elisabeth RIVARA MINTEN

EXCELLENCE FELLOWSHIP
Nayara CORIOLANO
Helena MANNOCHIO RUSSO
Patricia de OLIVEIRA FIGUEIREDO
Shuaizhen ZHOU

POSTDOCTORAL SCHOLARS
Pierre Marie ALLARD
Paul COULERIE

POSTDOCTORAL SCHOLARS
Adlin AFZAN
Abdul Elah ALFATTANI
Antonio AZZOLLINI
Théo BRILLATZ
Soula CHALLAL (until 30.04.2015)

RESEARCH AND TEACHING ASSISTANTS
Helena MANNOCHIO RUSSO
Patricia de OLIVEIRA FIGUEIREDO
Shuaizhen ZHOU

INTERNSHIP STUDENTS - CO-
SUPERVISION (CO-TUTELLE)
Assane DIOP

TECHNICAL STAFF
Laurence MARCOURT

ADMINISTRATIVE STAFF
Natalie SCHREGLE

RESEARCH FUNDS

SWISS NATIONAL SCIENCE FOUNDATION

"Localisation and dynamics of free and bound 12-oxo-phytodienoic acid (OPDA) pools in Arabidopsis" (31003A_163424 / 1)
Main Applicant: J.-L. WOLFENDER
Co-applicant: E. E. FARMER, UniL - G. GLAUSER, UniNE
Total funding: CHF 451'030.
Allocation 2016: CHF 183'614.
Duration: 3 years
Starting date: 2016

"NMR 600MHz for metabolomics and biomarker identification for life sciences, chemical biology and medical
projects at the University of Geneva" (316030_164095 1/1)
Main applicant: J.-L. WOLFENDER
Other beneficiaries/participants to the project:
UniGe: P. MAECHLER, Cellular physiology and Metabolism, Faculty of Medicin - N. VUILLEUMIER, DMGL
H. RIEZMAN, Biochemistry, Faculty of Sciences - L. LOPEZ MOLINA, Vegetal Biology, Faculty of Sciences
HUG: P.-Y. MARTIN, Nephrology, Intern Medicin - S. de SEIGNEUX MATTHEY, Nephrology, Intern Medicin
Total funding: CHF 809'460.
Allocation 2016: CHF 809'460.
Duration: 1 year
Starting date: 2016
"Study of leaf endophytic fungi: Exploration and valorization of biosourCed Innovative antibacterial metaboLites" (310030E-164289 / 1)
Main applicant: D. STIEN, Laboratoire de Biodiversité et Biotechnologies Microbiennes, UMPC, Banyuls-sur-Mer, France
Co-applicant: J.-L WOLFENDER - K. PERRON, UniGe
Co-applicant: J. CHAVE, University of Paul Sabatier, Toulouse, France
Co-applicant: V. EPARVIER, Institut de Chimie des Substances Naturelles, CNRS, Gif sur Yvette, France
Total funding: CHF 455'044.—
Allocation 2016: CHF 185'502.—
Duration: 3 years
Starting date: 2016

SINO SWISS SCIENCE AND TECHNOLOGY COOPERATION - SSSTC

Collaboration between the School of Pharmaceutical Sciences of the University of Shandong and Geneva Sino Swiss Science and Technology Cooperation Program (SSSTC) IP18-092011
Main applicant: J.-L WOLFENDER
Total funding: CHF 40'000.—
Allocation 2015: CHF 27'000.—
Duration: 1,5 years
Starting date: 2015

EU FUNDS

“Novel natural products for healthy ageing from Mediterranean diet and food plants of other global sources” (H2020-MSCA-RISE-2015
Main applicant: UNIVERSITAET INNSBRUCK, Austria
Co-applicant: J.-L. WOLFENDER, UNIGE
Co-applicant: ETHNIKO KAI KAPODISTRIAKO PANEPISTIMIO, Athens, Greece
Co-applicant: UNIVERSITEIT ANTWERPEN, Antwerpen, Belgium
Co-applicant: EIDGENOESSISCHE TECHNISCHE HOCHSCHULE, Zurich, Switzerland
Co-applicant: BIONORICA RESEARCH GmbH, Innsbruck, Austria
Co-applicant: GALENICA SA, Kifissia, Greece
Co-applicant: VIVACELL BIOTECHNOLOGY GmbH, Cordoba, Spain
Co-applicant: ROUSSELET CENTRIFUGATION SA, Annonay, France
Co-applicant: THE UNIVERSITY OF MEDICINE & PHARMACY, Ho Chi Minh, Vietnam
Co-applicant: TSHWANE UNIVERSITY OF TECHNOLOGY, Pretoria, South Africa
Co-applicant: FACULTE DES SCIENCES, Sfax, Tunisia
Co-applicant: UNIVERSIDAD CATOLICA DEL NORTE, Antofagasta, Chili
Total funding for UNIGE: EUROS 153'000.—(ca: CHF 165'626.—)
Allocation 2016: CHF 69'350.—
Duration: 3 years
Starting date: 2016

SOCIETE ACADEMIQUE

“2016/32 RMN 600”
Main applicant: J.-L. WOLFENDER
Total funding: CHF 25'000.—
Allocation 2016: CHF 25'000.—
Duration: 1 year
Starting date: 2016

FONDATION BONINCHI

“BONINCHI RMN”
Main applicant: J.-L. WOLFENDER
Total funding: CHF 80'000.—
Allocation 2016: CHF 80'000.—
Duration: 1 year
Starting date: 2016
FONDATION SCHMIDHEINY

“SCHMIDHEINY RMN”
Main applicant: J.-L. WOLFENDER
Total funding: CHF 40’000.--
Allocation 2016: CHF 40’000.--
Duration: 7 months
Starting date: 2016

FONDATION WILSDORF

“WILSDORF RMN 600”
Main applicant: J.-L. WOLFENDER
Total funding: CHF 150’000. —
Allocation 2016: CHF 150’000. —
Duration: 7 months
Starting date: 2016

INDUSTRY AND ASSIMILATED

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PUBLICATIONS

THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

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<td>Journal of Natural Products</td>
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<td>Phytochemistry</td>
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<td>Phytochemical Analysis</td>
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SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)


**Scientific publications (without impact factor)**

PRESENTATIONS

POSTERS PRESENTATIONS


10. A. AZZOLLINI, J. L. WOLFENDER, K. GINDRO. "De novo metabolite production through co-cultivation of different fungal species on solid media". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016


15. S. CRETTON, P. M. ALLARD, I. GARCIA-GOMEZ, K. ANHEUSER, B. WASTIAU, J. L. WOLFENDER, M. CUENDET, P. CHRISTEN. "Modern tools to analyse museum samples of curare and psychoactive preparations used by Amazonian tribes". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016


25. J. L. WOLFENDER, P. M. ALLARD."Integration of molecular networking and in-silico MS/MS fragmentation for sensitive high throughput natural products dereplication". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, 24-27 July, 2016


27. S. ZHOU, C. P. TANG, C. Q. KE, J. L. WOLFENDER, Y. YE. "Differentiation of plants used in TCM as antitussive agent by UHPLC-HRMS based metabolomics: the case of Stemona species". 9th Joint Natural Products Conference 2016, Copenhagen, Denmark, July 24-27, 2016


**Congresses & Symposia**


8. E. F. QUEIROZ, J. L. WOLFENDER. "Innovative strategies for the efficient isolation of natural products at the preparative scale and discovery of potential new leads". 6th International Congress on Medicinal and Aromatic Plants, 31 May - 1 June 2016, Coimbra (Portugal).

9. E. F. QUEIROZ, J. L. WOLFENDER. "Innovative strategies for the efficient isolation of natural products at the preparative scale and discovery of potential new leads". Analytica, 11 May 2016, Munich (Germany).

10. E. F. QUEIROZ, J. L. WOLFENDER. "Innovative strategies for the isolation of bioactive natural products from the Brazilian biodiversity". HII workshop da pós-graduação em química da UFC programação, 4 April 2016, University of Fortaleza, Fortaleza (Brazil).
11. E. F. QUEIROZ, J. L. WOLFENDER. "Innovative strategies for the isolation of bioactive natural products from the Brazilian biodiversity. Healthy eating: current food practices and concerns through a comparative Swiss-Brazilian lens". University of St Gallen, 22 April 2016, St Gallen (Switzerland).


16. J. L. WOLFENDER. "Towards an efficient and targeted isolation of valuable natural products only ". Simposium Nasional Kimia Bahan Alam XXIV (SimNasKBA-2016), 18-19 October 2016, Yogyakarta (Indonesia).


22. J. L. WOLFENDER. "Cherry picking of valuable natural products only based on deep metabolome investigation of herbal drugs". Shanghai International Conference on Traditional Chinese Medicine and Natural Medicine, 19-21 October 2016, Shanghai (China).

23. J. L. WOLFENDER. "How deep can we dig into plant and microbial metabolomes to identify biologically relevant biomarkers?". Seminar University of Georgia, 3 February 2016, Atlanta (USA).


25. J. L. WOLFENDER. "Research activities at the Phytochemistry and Bioactive Natural Products unit of the School of Pharmaceutical Science - Metabolite profiling and rational rapid targeted isolation". Seminar Pierre Fabre Laboratories, 27 September 2016, Toulouse (France).

26. J. L. WOLFENDER. "New ways to decipher plant and microbial metabolomes to identify bioactive natural products". Seminar University of Sydney, 2 April 2016, Sydney (Australia).

27. J. L. WOLFENDER, P. M. ALLARD. "Integration of molecular networking and in-silico MS/MS fragmentation for sensitive high throughput natural products dereplication ". 9th Joint Natural Products Conference 2016, Pre Conference Symposium: Advances in (bio) analytical techniques applied to natural products research, 24 July 2016, Coppenhagen (Denmark).

28. J. L. WOLFENDER, P. M. ALLARD."How far deep can we get into plant and microbial metabolomes with modern mass spectrometry approaches?". 10th International Symposium on Chromatography of Natural Products, 6-9 June 2016, Lublin (Poland).


**CONTINUING EDUCATION, WORKSHOPS & OPEN TO THE PUBLIC LECTURES**


**THESIS PRESENTED**

**INTRA-MUROS THESIS**

Quentin FAVRE-GODAL
“Development of innovative strategies for the discovery of new antifungals from natural sources and in depth investigation of their bioactivity profiles”
Thesis no 4898 – Université de Genève
Director: J.-L. WOLFENDER
Co-director: E.F. QUEIROZ

Daniel MAAG
“1,4-Benzoxazin-3-ones at the metabolic interface between plants and insects”
Thesis no 4925 – Université de Genève
Director: J.-L. WOLFENDER
Co-director: T. Turlings

Charlotte PETIT
“Towards a prediction of intestinal absorption of medicinal plant constituents with the PAMPA permeability assay”
Thesis no 5029 – Université de Genève
Director: J.-L. WOLFENDER
Co-director: P.-A. CARRUPT

Vera ODLRATI
“Venomics to decrypt the biomedical potential of spider toxins”
Thesis no 5041 – Université de Genève
Director: J.-L. WOLFENDER
Co-director: R. Stoecklin
Lorenzo BOGGIA
“Development of new strategies to study the composition of high complexity samples from biologically active plant species: definition of metabolite profiling in toto of biologically active fractions through advanced extraction methods and chromatographic techniques combined with mass spectrometry”
Università degli Studi di Torino
Director: P. RUBIOLO

Nalisha Binti ITHNIN
“Metabolomics-based profiling of oil-palm-Ganoderma interaction utilizing LC-MS and NMR”
University Putra Malaysia
Director: I.S. ISMAIL

Dapeng LI
“Tissue and population-level diversity in plant secondary metabolism: a systematic exploration using MS/MS structural analysis”
Max Planck Institute for Chemical Ecology
Director: I. BALDWIN
Co-director: G. POHNERT

Anne-Laure PEYRAT
“Recherche de composés actifs contre le virus de la dengue à partir de Diospyros sp. et de leurs endophytes associés”
Muséum National d’Histoire Naturelle
Director: D. STIEN
Co-director: M. LITAUDON

Florence AUBERON
“Stilbénoides et dérivés glucosyloxybenzyliques d’acides organiques isolés d’orchidées tropicales : Etudes chimiques et biologiques de Cyrtopodium paniculatum (Ruiz & Pav.) Gara y et Arundina graminifolia (D. Don) Hochr.”
University of Strasbourg
Director: A. LOBSTEIN
Research at the unit of Pharmaceutical Technology is focused on the delivery of therapeutic agents and contrast agents for medical imaging at the right site on the right time. Eric Allémann has activities in nanomedicine, micro particles, targeted-contrast agents for medical imaging. Norbert Lange leads research in photodetection, photodynamic therapy and enzymatically activated prodrug. Florence Delie leads research in nanomedicine and vectorization. In 2016, various collaborations were continued with the University Hospital of Geneva and the EPFL. Collaboration projects with established companies were continued and new ones initiated. Florence Delie leads research in nanomedicine and vectorization.

**Specific Research Fields**
- Development of drug formulations for intra-articular delivery
- Enzymatically-activated prodrugs and supramolecular constructs
- Development of new contrast agents for MRI
- Formulation of microbiota
- Polymeric photosensitizers projects
- Imaging of β-cells and amyloids
- Cancer targeted drug delivery systems

**2016 At a Glance**

<table>
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<tr>
<th>Category</th>
<th>Count</th>
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<tbody>
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<td>Posters presentations</td>
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<td>Congresses &amp; Symposia</td>
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STAFF

SENIOR LECTURER
Florence DELIE-SALMON

LECTURER
Pascal FURRER

EXCELLENCE FELLOWSHIP
Imène ATEB

SENIOR RESEARCH AND TEACHING ASSISTANTS
Andréj BABIC
Laurence NEFF (since 1.02.2016)

POSTDOCTORAL SCHOLARS
Ester BOIX GARRIGA
Karolina JANIKOWSKA

RESEARCH AND TEACHING ASSISTANTS
Imène ATEB
Pierre MAUDENS
Jordan BOUILLLOUX
Ioanna MYLONAKI
Carlota DE LACERDA SALGADO
Vassily VOROBIEV
Viktorija HERCEG

INTERNERSHIP STUDENTS – CO-SUPERVISION (CO-TUTELLE)
Bettina SCHWARZ (since 1.10.2016)

ADMINISTRATIVE STAFF
Florence VON OW

TECHNICAL STAFF
Nathalie BOULENS
Carole DUPRAZ

RESEARCH FUNDS

FNRS

Targeted photoablation of breast cancer through urokinase-sensitizer prodrugs
Main applicant : H. Acha-Orbea
Co-applicant : N. LANGE
Total funding : CHF 203’000
Allocation 2016 : CHF 0.--
Duration : 3 years
Starting date : 01.04.2013

Precision nanoconstructed drug eluting balloon catheters for perivascular diseases”KTI 18279.2 PFLS-LS)
Main applicant : E. ALLEMANN
Total funding : CHF 259’000
Allocation 2016 : CHF 0
Duration : 2 years
Starting date : 01.01.2016

Topical delivery of photosensitizers to atherosclerotic plaques and intra-arterial photodynamic therapy: a pre-clinical (CR3213_150271/1)
Main applicant : S. Cook
Co-applicant : N. LANGE
Total funding : CHF 200’040
Allocation 2016 : CHF 0
Duration : 3 years
Starting date : 01.12.2013
Development of eco-friendly and healthy plant-based feeds for sustainable animal farming - KTI 18541.3 PFLS-LS”
Main applicant: J. Montoya Burgos
Co-applicant: E. ALLEMANN
Co-applicant: D. Sutherland
Total funding: CHF 363’622.-
Allocation 2016: CHF 218’173.-
Duration: 2 years
Starting date: 01.12.2016

FONDATION NOVARTIS CONSUMER HEALTH

Fondation Novartis Consumer Health
Main applicant: E. ALLEMANN
Total Funding: CHF 70’000
Allocation 2016: CHF 0
Duration: 1 year
Starting date: 1.04.2015

INNOGAP ROUND 15 - UNITEC

Innogap Roud 15 - UNITEC
Main applicant: E. ALLEMANN
Total funding: CHF 30’000.-
Allocation 2016: CHF 30’000.-
Duration: 1 year
Starting date: 01.09.2016

FONDATION PRIVEE DES HOPITAUX UNIVERSITAIRES DE GENEVE

Fondation privée des hôpitaux universitaires de Genève: prix de l’innovation des HUG
Main applicant: E. ALLEMANN
Total funding: CHF 5’000.-
Allocation 2016: CHF 5’000.-

INDUSTRY AND ASSIMILATED

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THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

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<td>Biomaterials</td>
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<td>Journal of Controlled Release</td>
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<tr>
<td>Nanomedicine: nanotechnology, biology and medicine</td>
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<td>Bioconjugate chemistry</td>
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<td>International Journal of Pharmaceutics</td>
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<td>European Journal of Pharmaceutics and Biopharmaceutics</td>
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<td>European Journal of Pharmaceutical Sciences</td>
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<td>Journal of Pharmacology and experimental Therapeutics</td>
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<td>Pharmaceutical research</td>
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<td>Journal of Drug Targeting</td>
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SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)


SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)

1. P. FURRER, P. LAURENT. Incompatibilités avec des tensioactifs, PharmaJournal, 06 :5-8, 2016


Books or Books Chapters

1. J. BOUILLOUX, S. COLLAUD, N. LANGE. When Polymers See the Light – Applications in Photodynamic Therapy and Photodiagnosis, Handbook of Porphyrin Science, World Scientific (accepted for publication; 2016)


Presentations

Posters Presentations


2. V. HERCEG, A. BABIC, N. LANGE, E. ALLEMANN. Phosphatase-sensitive prodrugs for the systemic delivery of 5-aminolevulinic acid (5-ALA), Swiss Pharma Sciences Day, Bern, Switzerland, 31 August, 2016


Congresses & Symposia

1. A. MONTEILLIER, P. FURRER, E. ALLEMANN, M. CUENDET. Intranasal administration succeeds to overcome UG-46 low bioavailability and reveals its lung cancer chemopreventive activity, Swiss Cancer Center Lausanne Inaugural Symposium, Lausanne, 7-10 September, 2016


4. N. LANGE. «From the dark side of biohotonics, Workshop on Molecular Theranostics: Towards Personalised Photomedicine, Barcelona, Spain, January 2016


7. E. ALLEMANN. Local delivery of drugs by means of nano- and microparicles, new possibilities for the treatment of arthritic diseases, Research Symposium, Nanjing University of Chinese Medicine, China, 2016
8. E. ALLEMANN. Nanomedicines, History and industrial opportunities, Kick-of, meeting of NILE: Nanotechnology Innovation Laboratory Enterprise, a Ferring-Aché new company, Sao Paulo, 2016

CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. P. FURRER. “Cours et atelier de formation continue pour le CAP (Centre d’Animation des Pharmaciens de Suisse): Aromathérapie IV, University of Geneva, Switzerland, 5 April & 11 November, 2016
4. P. FURRER. «Cours de master en pharmacie et master en pharmacie industrielle MIP(Drug Delivery and Drug Targeting): Ophthalmic devices/dermopharmacy, EPFZ, Zürich, Switzerland, 6 December, 2016

THESIS PRESENTED

INTRA-MUROS THESIS

Nathalie STRANSKY-HEILKRON
“Development of contrast agents for imaging amyloids in type 2 diabetes – from chemical synthesis to in vivo trials”
University of Geneva - 2016
Thesis n° 4911 –
Directors: E. ALLEMAN, X MONTET

THESIS JURY

Giuseppina PISIGNANO, University of Geneva
Katrin FUCHS , University of Geneva
Shukai DING, University of Strasbourg
Delphine CARLI-GHABAROU, University of Geneva
Ameena JESAIMANI, University of Geneva
Ester BOIX GARRIGA, University Ramon Llull

PATENTS


AWARDS

P. MAUDENS, O. JORDAN, E. ALLEMANN, Innovation prize HUG, 2016
P. MAUDENS, O. JORDAN, E. ALLEMANN, Innovation prize Fongit/Eclosion, 2016
The pharmacognosy research unit is focused on the discovery of bioactive natural products. Compounds with cancer chemopreventive and antiparasitic activity are of particular interest. In these areas, the development of new and better drugs remains a principal need. As established by ample precedent, nature provides broad chemical diversity. Prevention is well developed in the field of cardiovascular disease, but similar drugs that could prevent cancer on this scale are still a long way off. A panel of in vitro bioassays indicative of inhibiting major stages of carcinogenesis (initiation, promotion and progression) is used. Mechanistic studies are then pursued with the most promising compounds. Also, most antiparasitic drugs available on the market (when available) have a limited efficacy and strong side effects. Some plant extracts having shown good in vitro and in vivo activity are currently being investigated to uncover the compounds responsible for the activity and their mechanism of action. The absorption and the metabolism of pure compounds and phytopreparations are also being evaluated in vitro and in vivo.

**Specific research fields**

- Cancer chemopreventive screening of natural products: quinone reductase induction, epigenetic modulation, anti-inflammatory and anti-angiogenic activity
- Antiparasitic activity
- Activity-guided fractionation
- Absorption and metabolization studies of phytopreparations and pure natural products using Caco-2 cells and in vivo models
- In depth studies to uncover the mechanism of action of pure natural products and phytopreparations
- Natural products against multiple myeloma resistance

**2016 AT A GLANCE**

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STAFF

VISITING PROFESSOR
Mohammad Sanad ABU-DARWISH

SENIOR LECTURER
Philippe CHRISTEN

EXCELLENCE FELLOWSHIP
Yanfei PENG

SENIOR RESEARCH ASSOCIATE
Sylvian CRETTON

RESEARCH AND TEACHING ASSISTANTS
Olivier CICLET
Mark ISSA
Aymeric MONTEILLIER
Noémie SARAUX
Chantal WALTER
Vincent ZWICK

ADMINISTRATIVE STAFF
Natalie SCHREGLE

TECHNICAL STAFF
Frédéric BORLAT
Colette SAUTY

RESEARCH FUNDS

FNRS
"Anticancer activity of selected medicinal plants from South of Jordan" (IZKOZ2_169635 /1)
Applicant: M. CUENDET
Total allocation: CHF 5’200.--
Allocation 2016: CHF 5’200.--
Duration: 2 months
Starting date: 2016

EU FUNDING
Integrated technologies for the discovery and development of cosmeceutical agents from plant biodiversity.
(NATPROTEC) IAPP-Marie Curie
Main applicant: M. CUENDET
Co-applicant: J. L. WOLFENDER
Total allocation for the entire project: Euros 1’813’624
Total allocation for M. CUENDET: CHF 263’225 (€ 222’131)
Allocation 2016: CHF 10’326
Duration: 4 years.
Starting date: 2012

DFAE – DÉPARTEMENT FÉDÉRAL DES AFFAIRES ETRANGÈRES (CONTRIBUITION FÉDÉRALE)
“NIGER: Plantasav” (7F05733.03.11)
Applicant: P. CHRISTEN
Total allocation: CHF 35’920.00
Allocation 2016: CHF 28’736.00
Duration: 1 year
Starting date: 2016

FONDATION SCHMIDHEINY
« Mise en place d’une méthode de criblage d’extraits de plantes et de composés naturels afin d’inhiber le développement de la bactérie Waddlia chondrophila »
Applicant: C. WALTER, PhD student in the group of M. CUENDET
Allocation 2016: CHF 15’000.00
Starting date: 2016
**INDUSTRY AND ASSIMILATED**

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**PUBLICATIONS**

**THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)**

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<td>Cancer Res</td>
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<tr>
<td>Cancer Prev Res</td>
<td>3.98</td>
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<tr>
<td>J Nat Prod</td>
<td>3.28</td>
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<tr>
<td>Phytochemistry</td>
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<tr>
<td>J Agr Food Chem</td>
<td>3.15</td>
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<tr>
<td>J Ethnopharmacol</td>
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<td>Molecules</td>
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<td>Bioorg Med Chem Lett</td>
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<td>Planta Med</td>
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<td>Phytochem Analysis</td>
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**SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)**


**PRESENTATIONS**

**POSTERS PRESENTATIONS**


3. S. CRETTON, P. M. ALLARD, I. GARCIA-GOMEZ, K. ANHEUSER, B. WASTIAU, J. L. WOLFENDER, M. CUENDET, P. CHRISTEN. Modern tools to analyse museum samples of curare and psychoactive preparations used by Amazonian tribes. 9th Joint Natural Products Conference, Copenhagen, Denmark, July 24-27, 2016

4. V. ZWICK, C.A. SIMOES-PIRES, L. ORY, P.M. ALLARD, J. L. WOLFENDER, M. CUENDET. A UHPLC/MS-MS-based HDAC assay applied to bio-guided microfractionation of fungi extracts. 9th Joint Natural Products Conference, Copenhagen, Denmark, July 24-27, 2016
5. S. CRETTON, P.M. ALLARD, I. GARCIA-GOMEZ, K. ANHEUSER, B. WASTIAU, J. L. WOLFENDER, M. CUENDET, P. CHRISTEN. Modern tools to analyse museum samples of curare and psychoactive preparations used by Amazonian tribes. 9th Swiss Pharma Science Day, Bern, Switzerland, August 31, 2016


7. A. MONTEILLIER, P.M. ALLARD, K. GINDRO, J. L. WOLFENDER, M. CUENDET. NF-κB inhibition of patulin isolated from Penicillium vulpinum via an IKK independent mechanism. 9th Swiss Pharma Science Day, Bern, Switzerland, August 31, 2016

8. N. SARAUX, P. CHRISTEN, M. CUENDET. Biological activities of plants from Niger used in traditional medicine. 9th Swiss Pharma Science Day, Bern, Switzerland, August 31, 2016

9. A. MONTEILLIER, P. M. ALLARD, K. GINDRO, J. L. WOLFENDER, M. CUENDET. NF-κB inhibition of patulin isolated from Penicillium vulpinum via an IKK independent mechanism. 30ème Séminaire en Sciences pharmaceutiques, Zermatt, Switzerland, September 5-9, 2016

10. M. E. ISSA, M. CUENDET. Withaferin A targets multiple myeloma cancer stem cells in vitro. ISREC-Swiss Cancer Center Lausanne, Inaugural Symposium, Lausanne, Switzerland, September 7-10, 2016

11. A. MONTEILLIER, P. FURRER, E. ALLÉMANN, M. CUENDET. Intranasal administration succeeds to overcome resveratrol low bioavailability and reveals its lung cancer chemopreventive activity. ISREC-Swiss Cancer Center Lausanne, Inaugural Symposium, Lausanne, Switzerland, September 7-10, 2016

Congresses & Symposia


2. S. CRETTON, M. CUENDET, P. CHRISTEN. Chemical constituents from *Waltheria indica* and their biological activities. V Congreso Iberoamericano de Productos Naturales, Bogota, Colombia, April 25-29, 2016


4. M. CUENDET. The use of natural products to treat multiple myeloma. Xi’an hospital, Xi’an, China, May 13, 2016


6. M. CUENDET. Natural products targeting multiple myeloma cancer stem cells. 7th International PharmSci Conference, Glasgow, United Kingdom, September 5-7, 2016

Thesis

Intra-Muros Thesis

Vincent Zwick
“HDAC inhibitors from natural and synthetic libraries: towards the development of biochemical probes”
Thesis No 4985 - September 12, 2016
Co-directors: M. Cuendet, P.-A. Carrupt

Thesis Jury

Lionel Sacconay,
“In silico-driven strategies for the identification of novel sirtuin modulators”
Thesis N° 4904 - February 26, 2016, University of Geneva
Co-directors: P.-A. Carrupt, A. NuriSSO

L. Curti,
“EZH2 induces methylation of ERG enhancing its transcriptional and transforming activity”
Thesis N° 4913 - March 11, 2016, University of Geneva
Director: L. Scapozza
The team of pharmacochemistry developed original theoretical and experimental methods able to quantify intermolecular interactions of a drug with its biological partners such as therapeutic targets or biological membranes. This research intended to accelerate the discovery of chemical compounds of therapeutic interest and to optimize the effectiveness, the selectivity and the safety of the selected drug candidates. They were centered on the development and validation of in silico and in vitro HTS filters to characterize physicochemical properties, passive membrane permeation and cellular efflux of new chemical entities. Virtual and in vitro HTS screening approaches were optimized to study the interactions with some specific bio-targets involved in neurodegenerative diseases like Alzheimer and Parkinson’s diseases were measured in order to identify multifunctional drug candidates.

**Specific Research Fields**

Biochemical screening: enzyme inhibition; antioxidant profiling of NCEs; antiapoptotic properties of NCEs; enzymatic hydrolysis of drugs and prodrugs; inhibition of hERG channel; inhibition of HDAC and SIRT proteins. Molecular modelling: Intermolecular interaction fields; indirect molecular modelling; direct molecular modelling. Physicochemical screening: Physicochemical profiling; antioxidant properties. Permeation screening: passive permeation profiling using PAMPA-membranes to mimic the skin, the intestinal barrier and the blood-brain barrier. 3D-QSAR models associated with proteins responsible of cellular efflux in membrane permeation or multi-drug resistance.

**2016 at a Glance**

- Publications with impact factor: 17
- Posters presentations: 2
- Congresses & Symposia: 3
- Ph.D. Thesis presented in 2016: 4
- Awards: 1

**Staff**

**Postdoctoral Scholars**
- Carolina DOS SANTOS PASSOS

**Research and Teaching Assistants**
- Nathalie DESCHAMPS
- Charlotte PETIT
- Stéphanie ROMAND
- Lionel SACONNAY
- Vincent ZWICK

**Internship Students – Co-Supervision (co-tutelle)**
- Chiara TORTIA

**Administrative Staff**
- Sylvia PASSAQUAY

**Technical Staff**
- Christophe FRANCEY
- Emilie REGINATO
**THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)**

<table>
<thead>
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<th>Publication Title</th>
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<td>Eur. J. Med. Chem.</td>
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<td>J. Comp. Aided Drug Des.</td>
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<td>Bioorgan. Med. Chem.</td>
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**SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)**


PRESENTATIONS

POSTERS PRESENTATIONS

1. V. ZWICK, C. A. SIMÕES-PIRES, L. ORY, P. M. ALLARD, K. GINDRO, J. L. WOLFENDER, M. CUENDET. A UHPLC/MS-MS-based HDAC assay applied to bio-guided micro-fractionation of fungi extracts. 9th Joint Natural Products Conference, 24-27 July 2016, Copenhagen (Denmark).


ORAL PRESENTATIONS


Congresses & Symposia


2. C. SIMÕES-PIRES. 9th Joint Natural Products Conference, 24-27 July 2016, Copenhagen (Denmark).

CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES

1. C. SIMÕES-PIRES.
   Technical vocabulary for Biology and Chemistry technicians.
   Ecole des métiers du laboratoire (ECLAB). Geneva (Switzerland). Lectures (24 h).

2. A. NURISSO.
   Computer-aided drug design: methods and applications.
   UE optionnelle Master ISM. Université Grenoble-Alpes (France). Lectures (6 h).

THESIS PRESENTED

INTRA-MUROS THESIS

Lionel SACCONNAY
«In silico-driven Strategies for the Identification of Novel Sirtuin Modulators»
Thesis N° 4904 - University of Geneva – 2016 –
Directors : P.-A. CARRUPT, J.-L. VEUTHEY, A. NURISSO

Stéphanie ROMAND
«Nouvelles approches in vitro pour l’étude de la physico-chimie et du métabolisme de phase II de composés pharmaceutiques»
Thesis N° 4978 - University of Geneva – 2016 –
Directors: P.-A. CARRUPT, S. RUDAZ

Vincent ZWICK
HDAC inhibitors from natural and synthetic libraries: towards the development of biochemical probes.
Thesis N° 4985 - University of Geneva – 2016 –
Directors: P.-A. CARRUPT, M. CUENDET

Charlotte PETIT
Towards a Prediction of Intestinal Absorption of Medicinal Plant Constituents with the PAMPA Permeability Assay.
Thesis N° 5029 - University of Geneva – 2016 –
Directors: P.-A. CARRUPT, J.-L. WOLFENDER

THESIS JURY

Sini RADHAKRISHNAN
Development of Tyrosinase Inhibitors.
Faculty of Science School of Mathematical and Physical Sciences, University of Technology Sydney, 25 July 2016 Sydney (Australia).
Jury member: A. NURISSO

Mohamed Dit Mady TRAORE
Synthèse et études de modélisation moléculaire dans l’optimisation de la sélectivité de nouveaux agents antiparasitaires inspirés de produits naturels.
Université Grenoble Alpes, 15 novembre 2016, Grenoble (France).
Jury member: C. SIMÕES-PIRES

AWARDS & DISTINCTIONS

C. DOS SANTOS PASSOS, best poster prize.
Clinical Pharmacy Sciences

Professor Chantal CSAJKA

General Description of the Unit

The mission of the Sciences in clinical pharmacy group is to promote post-marketing drug optimisation revolving around three main axes. The first research focus is therapeutic individualisation by the comprehension of the demographic, physiopathologic, environmental or genetic determinants influencing therapeutic response or toxicity. The second axis comprises research on security and efficacy of drugs, in particular in vulnerable population (pediatrics, geriatrics, oncology) and third research focus is the development of tools and guidelines allowing for therapeutic optimisation. The methods used are based on quantitative and qualitative techniques, including modeling and simulations and epidemiological studies. The overall goal of the research is to increase the knowledge on the pharmacokinetics and pharmacokinetic-pharmacodynamic relationships of commercialized drugs at particular risk and to improve safety and efficacy in order to improve their use in clinical practice.

Specific Research Fields

The following achievements have been done in 2016.

a) Drug individualisation. Several projects on the pharmacokinetic characterisation of antiretroviral and psychoactive drugs have been fulfilled, with direct implication in clinical practice. In the field of HIV, a new research line has been opened focusing on the modeling of metabolic traits, in collaboration with the Swiss HIV Cohort Study. It will provide a better comprehension of the development of drug-related toxicity in the HIV population. A SNF grant has been granted to study drug-drug interaction of HIV drugs in the elderly population. In Oncology, the clinical study aiming at better defining therapeutic targets of tyrosine kinase inhibitors and adherence patterns of patients under long-term treatment is ongoing.

b) Drug efficacy and security. The multicentric study evaluating antidepressant use during pregnancy and lactation and supported by the SNF has provided first analytical results on drug concentrations in blood and breast milk as well as new data on transplacental transfer of those drugs along with new insight of the genetic influence on it. A first analysis of citalopram/escitalopram allowed the quantification of drug level trough lactation and estimation of the risk for breastfeeding women.

c) Tools for drug optimisation in clinical practice. The collaborative project with the EPFL and the HEIG-VD supported by the Nano-Tera project of the SFN aiming at developing a software (www.ezechiel.ch) for Bayesian dosage adjustment is still ongoing (ISyPeM: Intelligent Integrated Systems for Personalized Medicine, www.nano-terea.ch/projects/405.php and ISyPeM II, www.nano-terea.ch/projects/368.php). Through a funded PNR74 project, we are starting a new line of research for the automatic detection of adverse drug events related to antithrombotic use in the geriatric population trough structured data mining and natural language processing. This Swiss Project involving 5 hospitals (Geneva, Lausanne, Sion, Zürich and Baden) will allow the implementation of algorithms for risk management optimisation in hospitals.

2016 At a Glance

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
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<tr>
<td>Publications with impact factor</td>
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STAFF

SENIOR RESEARCH ASSOCIATE
Monia GUIDI

RESEARCH AND TEACHING ASSISTANTS
Catalina BARCELÓ
Evelina CARDOSO
Akram FAHRAT
Etienne WEISSKOPF
Wenyuan XIONG

INTERNSHIP STUDENTS-CO-SUPERVISION (CO-TUTELLE)
Anaïs GLATARD

ADMINISTRATIVE STAFF
Dominique HUNZIKER

RESEARCH FUNDS

FNRS

Prediction of infant drug exposure to antidepressant drugs through breastfeeding using population pharmacokinetic modeling and simulation
Main applicant: C. CSAJKA
Co-applicants: J.F. TOLSA, C.B. EAP
Total Funding: CHF 288’000.-
Allocation 2016: 0.--
Duration 4 years
Starting date: 1.4.2012

Modeling, simulation and clinical validation of drug interactions in the Swiss HIV Cohort Study (FN 324730_165956)
Main applicant: L. Decosterd
Co-applicants: C. CSAJKA, T. Buclin
Total Funding: CHF 430’500.—
Allocation 2016: CHF 100’000.—
Duration: 3 years
Starting date: 1.5.2016

SWISS CANCER LEAGUE – ACCENTUS GRANT

Main applicant: M.-P. SCHNEIDER
Co-applicants: C. CSAJKA, D. Wagner
Total Funding: CHF 248’200.—
Duration: 4 years
Allocation 2016: CHF 62’000.—
Starting date: 1.6.2016

INDUSTRY AND ASSIMILATED

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**THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)**

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<tr>
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<td>Clinical Pharmacology and Therapeutics</td>
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<tr>
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<tr>
<td>Antimicrobial Agents and Chemotherapy</td>
<td>4.47</td>
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<tr>
<td>British journal of clinical pharmacology</td>
<td>3.83</td>
</tr>
<tr>
<td>Antiviral Therapy</td>
<td>3.02</td>
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<tr>
<td>Expert Opinion On Drug Safety</td>
<td>2.89</td>
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<tr>
<td>Biomarkers in Medicine</td>
<td>2.17</td>
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<tr>
<td>Therapeutic drug monitoring</td>
<td>2.09</td>
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<tr>
<td>Journal of clinical pharmacy and therapeutics</td>
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**SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)**


**PRESENTATIONS**

**Posters presentations**


**Congresses & Symposia**

1. **C. CSAJKA, P. GIRARD.** Pharmacokinetics and Pharmacodynamics of Protein Therapeutics. Co-organisers of the workshop, Lausanne, March 2016.


**Continuing education & open to the public lectures**

1. **C. CSAJKA.** Suivi thérapeutique pharmacologique: zoom sur l’imatinib et l’erlotinib. 4<sup>e</sup>éme journée de pharmacologie des antitumoraux, Paris, December 2016.

2. **C. CSAJKA.** Utilité de la modélisation PK pour l’individualisation posologique bayésienne des ITKs. XVIES Journées du groupe de pharmacologie clinique oncologique, Toulouse, November 2016

INTRA-MUROS THESIS

Etienne WEISSKOPF

Antidepressant treatments during pregnancy and lactation: prediction of drug exposure trough reastfeeding and evaluation of drug effect on the neonatal adaptation and the development of the young child
University of Geneva – 2016 –
thesis N° 4904
Supervisor : Prof. C. CSAJKA

THESIS JURY

Sylvain GOUTELLE. Rôle de la pharmacologie quantitative dans l’évaluation, l’individualisation et l’optimisation des traitements médicamenteux.Thèse d’habilitation HRD, University Claude Bérard Lyon.

Laure LALANDE. Modélisation de la pathologie et du traitement de la tuberculose: application à l’isoniazide. Thèse de doctorat, University Claude Bérard Lyon

Stéphanie ROMAND. Nouvelles approches in vitro pour l’étude de la physico-chimie et du métabolisme de phase II de composés pharmaceutiques Thèse de doctorat, Université de Genève

Nathalie STRANSKY. Development of Contrast Agents for Imaging Amyloids in Type 2 Diabetes – From Chemical Synthesis to In Vivo Trials. Thèse de doctorat, Université de Genève.
The fact of prescribing, recommending or swallowing a drug seems banal and yet there are many traps: side effects, insufficient effectiveness, too high costs, non-adherence, waste, lack of motivation, altered quality of life, etc. These topics, as well as the evolution of advanced pharmacy services are considered as priorities of action for academic and clinical activities of the Community Pharmacy Center of the PMU (Policlinique Médicale Universitaire), a unique place in Switzerland, which combines practice, research, development and education.

Olivier Bugnon, chief pharmacist of the Community Pharmacy Center of the PMU, is on the other hand an Associate Professor at the School of pharmaceutical sciences (University of Geneva, University of Lausanne); with his group, he participates in the research and development of Community Pharmacy practice, a clinical pharmaceutical science which respects the public health priorities and the central role of the patient. His main teaching responsibility is the organization of the second year of the Master in Pharmacy (year of assistantship). He supervises the examinations of the Master and is member of the Federal Committee for the State Exam in Pharmacy. His research activities (8 PhD students in pharmaceutical sciences in 2016) explore ways of collaboration between physicians, pharmacists and other health care workers to improve the responsible use of medicines (effectiveness, safety, efficiency, positive patient-related outcomes).

**SPECIFIC RESEARCH FIELDS**

The research of the Community Pharmacy Center at the PMU covers the three following areas:

1. **PEOPLE-/PERSON-CENTERED AND INTEGRATED CARE**

   The global trend for health systems is people- and person-centeredness, coordination, networking and continuity of care. Pharmacists are at the interface of the treatments prescribed by the physicians and the OTC treatments. The evolution of their role turns towards collaborative pharmacy practice and e-health strategies, aiming at the global quality of the care and control of the health care costs. In 2016, the Community Pharmacy Center of the PMU worked on the following topics and projects:

   - Evaluation of the Quality circles physicians-pharmacists-nurses in nursing homes (cantonal projects in Fribourg and Vaud), including study of the opportunities and limits of deprescribing in nursing homes.
   - Risk evaluation and mitigation strategies – REMS (e.g. multiple sclerosis patients, home-based subcutaneous immunoglobulin, patients with oral anticancer medications)
   - Exploration of e-Health strategies facilitating the interprofessional collaboration and the person-centeredness (e.g. shared e-medication plan in the canton of Vaud; web-platform SISPha*)
   - Exploration of change management strategies facilitating the implementation of advanced cognitive pharmacy services (e.g. implementation of the interprofessional SISCare® concept)
   - Animation of the network of the pharmacists specialized in Addiction Medicine in the French-speaking part of Switzerland - COROPHA (project supported by the FOPH and COROMA)

   *The research on people-/person-centered and integrated care is closely linked to the two other areas « medication adherence » (e.g. oncology, multiple sclerosis) and « safety and cost effectiveness of drugs » (e.g. in geriatrics). This research involves cross-sectional scientific collaborations between pharmaceutical, medical, human and economic sciences.*

2. **MEDICATION ADHERENCE**

   The daily and prolonged taking of medicine is difficult for chronic patients, especially in case of side effects, complex treatments, lack of motivation, incomprehension or refusal of the treatment. Stopping or forgetting to take one’s medicine is nevertheless a normal human behavior. The medication adherence defines itself as a dynamic active process in which the patient works to maintain his health in collaboration with the medical team.
The researchers of the Community Pharmacy Center of the PMU, in collaboration with various physicians and nurses, are interested in the scientific support and evaluation of the medication adherence in the routine care in domains like for example high blood pressure, VIH infections, diabetes, multiple sclerosis, oral anticancer medications, transplantations. The adherence programs (see M. Lelubre et al. BioMed Research International. Volume 2015 (2015), Article ID 103546, 10 pages) are concretized by:

- Motivational, semi-structured interviews, lead by a pharmacist;
- The measure of medication adherence through an electronic medication pillbox and it’s relation with the effects of the therapy;
- The sharing of data collected in pharmacies (e.g. persistence, implementation, side effects, preferences of patients and their relatives) within the patient and the healthcare workforce.

_The research on the medication adherence also contributes to the goals of the area « people-/person-centered and integrated care »._

3. SAFETY AND COST EFFECTIVENESS OF DRUGS

Drugs represent the option most frequently used by the physicians. The prescription formalizes the therapeutic plan with the concordance of the patient; it represents an essential communication tool for the collaboration with the pharmacist. Drug related problems experienced by the patients and medication errors are too frequent. They are usually a sign of system failure, a cost factor and breaks of the seamless care: many good reasons to study scientifically the provided services likely to manage drug risk as well as to improve safety, effectiveness and efficiency of the medicines.

_This research area is naturally closely linked with the two other areas « medication adherence » and « people-/person-centered and integrated care »._

### 2016 AT A GLANCE

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<th>Topic</th>
<th>Quantity</th>
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### STAFF

**Senior Lecturer**

Jérôme BERGER

**Research Associate and Senior Research Associate**

Marie-Paule SCHNEIDER VOIROL

**Postdoctoral Scholar**

Mélanie LELUBRE

**Research and Teaching Assistants**

Aline BOURDIN Jennifer CELIO

Damien CATEAU Susan KAMAL ABDELRAHMAN

**Internship Students — Co-Supervision (co-tutelle)**

Noura BAWAB (Student, University libre de Bruxelles)

**Administrative Staff**

Dominique HUNZIKER
RESEARCH FUNDS

FEDERAL OFFICE OF PUBLIC HEALTH (FOPH)

Elaboration of the Federal Exam for Pharmacy 2015
Participation des experts de la Section des sciences pharmaceutiques (University of Geneva, University of Lausanne) - (Contract No. 16.015619 / 704.0001/ -685) -
Main applicant: O. BUGNON
Allocation 2016: CHF 378'922
Duration: 1 year

Scientific evaluation of a person-centered and integrated care concept for Type-2 Diabetes patients [SISCare®-DT2]
(Contract No. 15.003846 / 604.0001/ -434)
Main applicants: O. BUGNON (PMU/EPGL) et C. ROSSIER (SISPha SA)
Total allocation : CHF 216’000
Allocation 2016: CHF 48’600
Duration: 4 years
Starting date: 2015

CANTONAL OFFICE OF PUBLIC HEALTH - VAUD

Development, implementation and evaluation of a the cantonal interprofessionnal programme « Physicians-Nurses-Pharmacists quality circles in nursing homes »
Main applicant: O. BUGNON
Total allocation : CHF 300’000
Allocation 2016: CHF 30’000
Duration: 10 years
Starting date: 2007

Organisation and animation of a Quality circle physicians-pharmacists-nurses in the nursing homes of the « Fondation Asile des Aveugles (FAA) »
Main applicant: O. BUGNON et J. BERGER
Allocation 2016: CHF 32’267
Duration: 1 year
Starting date: 2016

INDUSTRY AND ASSIMILATED

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PUBLICATIONS

THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

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<tbody>
<tr>
<td>American Journal of Health System Pharmacy</td>
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<td>Annals of Pharmacotherapy</td>
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<tr>
<td>Disease Management and Health Outcomes</td>
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<td>International Journal of Pharmacy Practice</td>
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<td>Journal of Clinical Pharmacy and Therapeutics</td>
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<td>Journal of Managed Care Pharmacy</td>
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<td>Patient Education and Counselling</td>
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<tr>
<td>Revue Médicale Suisse</td>
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SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)

1. C. PERRAUDIN, O. BUGNON, N. PELLETIER-FLEURY: "Expanding professional pharmacy services in European community setting: is it cost-effective? A systematic review for health policy considerations" Health Policy. 120, pp1350-62 (2016)


SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)

<table>
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3. A. LACHKAR ; R. GAUTHIER ; J. BERGER : « Interactions médicamenteuses avec le pamplemousse » Actualité Médicaments - N° II /2016 (intranet PMU)


8. C. ROCHAT, E. RESENTERRA, J. BERGER: "Désinfectants pour les surfaces et le matériel non immergeable » Actualité Médicaments - N° 7/2016 (intranet PMU)


**PRESENTATIONS**

**POSTERS PRESENTATIONS**


7. S. KAMAL, I. LOCATELLI, A. SEHAT, M. METRAL, O. BUGNON, R. DU PASQUIER, M. CAVASSINI, M. P. SCHNEIDER. The impact of HIV Neurocognitive Disorders (HAND) on adherence to combined Antiretroviral Therapy (cART). SSID (Swiss Society of Infectious Diseases), Montreux, Switzerland, September 1, 2016.


14. S. KAMAL, O.BUGNON, M. CAVASSINI, M. P.SCHNEIDER. HIV patients’ beliefs about their chronic co-treatments in comparison with their combined antiretroviral therapy (cART). ESPACOMP (European Society for Patient Adherence, COMpliance and Persistence), Lisbon, Portugal, November 17-19, 2016.


**CONGRESSES & SYMPOSIA**


3. O. BUGNON. “La collaboration médecins-pharmaciens dans le cadre de l’axe stratégique de soins coordonnés à la PMU de Lausanne”, Journée des Policliniques Lausanne-Genève, February 4, 2016, Lausanne


13. M. P. SCHNEIDER. “IT use to improve medication adherence and provide feedback on patient status. Session entitled ‘Technology to engage patients”. 76th FIP World Congress of Pharmacy and Pharmaceutical Sciences, Buenos Aires, Argentina, August 28-Sept 1, 2016


18. O. BUGNON. “How can we get good relationship between physicians and pharmacists in a local area? Practice example in the Lausanne district (quality circles, medication adherence, risk management plans)”, The 49th JPA Congress of Pharmacy and Pharmaceutical Science in Aichi, Nagoya, Japan, October 9, 2016.


CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES


11. J. BERGER. « Quand médicaments et alimentation ne font pas bon ménage », Formation continue interprofessionnelle - Symposium EMS, Lausanne, Switzerland, March 3, 2016


14. O. BUGNON, A. NIQUILLE, C. ROSSIER. « Bonnes pratiques de prescriptions des antihypertenseurs (IT 02.03, 02.06, 02.07, 05.01) », Cercle de Qualité médecins-pharmaciens de Lausanne-1, Paudex, march 9, 2016.


16. J. BERGER. « Traitements oncologiques oraux », Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, March 21, 2016

17. J. BERGER, E. RESENTERRA. « Circuit médicamenteux des vaccins », Formation continues pour infirmiers, Cully, April 7, 2016

18. L. PERRIARD, J. BERGER, D. HUGENTOBLE. « Constipation – Nouveautés”, Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, April 18, 2016


20. J. BERGER. « Interactions médicamenteuses : comment les gérer pratiquement de manière efficace !? », Formation continue pour pharmaciens - CAP, Lausanne, Switzerland, April 21, 2016


25. O. BUGNON. « Quoi de neuf pour le suivi pharmaceutique des patients asthmatiques ou BPCO? », Formation continue pour pharmaciens - Société cantonale de Fribourg, Fribourg, Switzerland, May 12, 2016


30. J. BERGER, D. HUGENTOBLER. « Chaque personne est unique, ses médicaments aussi - La Pharmacie de la PMU, l’expertise accessible à tous », Colloque Cercle de Qualité de la Consultation de Médecine Générale de la PMU, Lausanne, Switzerland, June 1st, 2016
31. S. THALMANN-MEJDI. « Traitement des plaies : cas pratiques rencontrés », Formation continue pour pharmaciens - PharmActuel, Lausanne, Switzerland, June 7, 2016
33. Y. DUBOIS, S. THALMANN-MEJDI, J. BERGER. « Classe des antiasthmatisiques et nouveautés dans le traitement de la BPCO » Cercle de qualité interprofessionnel en EMS, Ecublens (VD), Switzerland, June 14, 2016
34. O. BUGNON. « Présent et futur de la Pharmacie communautaire en Suisse », Visite de la Faculté de Pharmacie de l’Université de Bourgogne, PMU, Lausanne, June 15, 2016.
35. E. OBERSON, J. BERGER, D. HUGENTOBLER. « Nouveaux ACO – Lixiana® » Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, June 20, 2016
36. J. BERGER. « Les antibiotiques en pratique ». Formation continues pour médecins-dentistes CMDO, PMU, Lausanne, Switzerland, June 22, 2016
38. Y. DUBOIS, S. THALMANN-MEJDI, J. BERGER. « Prescriptions des IPP et des analgésiques palier 1 ». Cercle de qualité interprofessionnel en EMS, Ecublens (VD), Switzerland, September 6, 2016
39. C. PELLATON, D. HUGENTOBLER, J. BERGER. « Insuffisance cardiaque – Entresto® ». Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, September 12, 2016
40. J. BERGER. « Les antibiotiques en pratique ». Formation continues pour dentistes ITI, Lausanne, Switzerland, September 12, 2016
42. J. BERGER. « Interactions médicamenteuses : comment les gérer pratiquement de manière efficace ?! ». Formation continue pour pharmaciens - CAP, Cully, Switzerland, September 22, 2016
43. O. BUGNON. « Bilan 2014-2015 du groupe de cercles Vaud-1 et bonnes pratiques de prescription des antihypertenseurs (en particulier les classes thérapeutiques IT 02.03, 02.06, 02.07 et 05.01) », Cercle de qualité médecins-pharmaciens d’Échallens, Échallens, September 22, 2016.
47. S. THALMANN-MEJDI. « Système Cardiovasculaire : cas pratiques de validation d'ordonnance ». Formation continue pour pharmaciens - PharmActuel, Lausanne, Switzerland, October 11, 2016

50. Y. DUBOIS, D. HUGENTOBLER, J. BERGER. « Intolérances et allergies aux excipients ». Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, October 24, 2016


53. J. BERGER. « Où trouver des informations en lien avec les médicaments ? : cas pratiques rencontrés ». Formation continue pour pharmaciens - PharmActuel, Lausanne, Switzerland, November 8, 2016


55. A. NIQUILLE, C. ROSSIER, O. BUGNON. « Bonnes pratiques de prescription en pneumologie (asthme et BPCO) », Cercle de Qualité médecins-pharmaciens pour la prescription ambulatoire, Lausanne1, Paudex, Switzerland, November 16, 2016

56. O. BUGNON. « Bonnes pratiques de prescription des antibiotiques (IT 08.01) », Cercle de qualité médecins-pharmaciens d’Échallens, Échallens, November 17, 2016.

57. E. OBERSON, J. BERGER, D. HUGENTOBLER. « Hypolipémiants – nouveautés», Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, November 21, 2016


59. J. BERGER, A. BOURDIN. « Sclérose en plaque : options thérapeutiques et accompagnement des patients en officine ». Formation continue pour pharmaciens - Ordre neuchâtelois pharmaciens, Neuchâtel, Switzerland, November 22, 2016

60. J. BERGER, D. HUGENTOBLER. « Chaque personne est unique, ses médicaments aussi » - La Pharmacie de la PMU, l’expertise accessible à tous ». Colloque Cercle de Qualité de la Consultation de Médecine Générale de la PMU, Lausanne, Switzerland, November 23, 2016


64. J. BERGER. « Le patient sous traitement oncologique à l’officine - Partie 2». Formation continue pour pharmaciens - CAP, Cully, Switzerland, December 6, 2016

65. J. AUBERT, O. BUGNON. Less is more en pratique clinique – Atelier « Polypharmacie et déprescription en médecine ambulatoire », Programme de formation continue Jeudi de la PMU, Lausanne, December 5, 2016.

66. C. PELLATON, D. HUGENTOBLER, J. BERGER, « Antidote des nouveaux anticoagulants oraux – Praxbind® » Colloque des Chefs de clinique de la Consultation de Médecine Générale, PMU, Lausanne, Switzerland, December 12, 2016


**THESES PRESENTED**

**INTRA-MUROS THESIS**

ANTHONY GROGNUZ
“Human fetal progenitor tenocytes for the treatment of tendon afflictions”
Theis Nr: 4886, University of Geneva, January 14, 2016
Directors: L. A. Applegate, O. BUGNON

**THESIS JURY**

JEAN-DIDIER BARDET
“Les pratiques pharmaceutiques collaboratives en soins de premier recours dans le contexte de l’émergence des technologies de l’information et de la communication”
Faculty of pharmacy of Grenoble, July 4, 2016

MARKUS MESSERLI
“Clinical pharmacy services and evaluation of medicines use: the case of the Swiss polymedication check”
Faculty of Science, University of Basel, June 30, 2016
Thesis jury: K. HERSBERGER, O. BUGNON

MARTA SABATER GALINDO
“Pharmacist-patient interaction in community pharmacy using the delivery of Medication Review with follow-up”
University of Granada, Spain, December 2, 2016
Thesis jury: O. BUGNON

**RADIO TELEVISION INTERVENTION**

D. HUGENTOBLE HAMPÄI
RTS, CQFD, May 16, 2016
Le comment du pourquoi: médicament modifié

D. HUGENTOBLE HAMPÄI
RTS, CQFD, June 13, 2016
Le comment du pourquoi: médicaments à la pièce

D. HUGENTOBLE HAMPÄI
RTS, CQFD, June 22, 2016
Le comment du pourquoi: millepertuis et médicaments

D. HUGENTOBLE HAMPÄI
RTS, CQFD, June 28, 2016
Le comment du pourquoi: aliments et médicaments
M.P. SCHNEIDER, J. CELIO
RTS, CQFD, September 13, 2016
Gros plan sur l’adhésion thérapeutique

GENERAL DESCRIPTION OF THE UNIT

The CHUV hospital pharmacy group works in close collaboration with the HUG pharmacy and other hospital pharmacies to develop research and education activities in hospital and clinical pharmacy. The undergraduate education is mainly focused on a full course (32 h) of hospital pharmacy dispensed during the 3rd year of the baccalaurean cursus. A post-graduate education (MAS) in hospital pharmacy is also proposed since 1999 on the HUG and CHUV sites, in collaboration with the Valais hospital. This three years program is a complete specialization in hospital pharmacy, associating theoretical and practical teachings, as well as a one year research project. CHUV pharmacy also proposes positions for PhD students in pharmaceutical sciences, either for pharmacists having achieved their MAS, or in direct access. The topics are diversified among the research fields described below. For more information: CHUV pharmacy: http://www.chuv.ch/pha

SPECIFIC RESEARCH FIELDS

Drug risk management
- Prospective risk analysis in hospital processes (FMECA method)
- Impact of information technologies on patient safety at prescription, dispensing and administration of drugs
- Impact of human factors on error rates at different steps of the medication use process.

Optimization of clinical use of drugs
- Securing and optimizing the drug use process by developing a clinical pharmacy activity
- Evaluation and improvement of specific administration techniques (i.e. enteral feeding tubes, nebulisation, intrathecal).
- Continuity of care at hospital discharge Detection, prevention, management and evaluation of drug incompatibilities

Development of hospital pharmaceutical forms
- Development of ready-to-use formulations adapted to hospital specificities, and validation of production processes.
- Formulation of pediatric parenteral nutrition

Pharmaceutical analysis
- Development and validation of generic separation methods for the dosage of active ingredients contained in hospital pharmaceutical formulations. Pharmacoeconomics and pharmacoepidemiology

2016 AT A GLANCE

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<td>Congresses &amp; Symposia</td>
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<tr>
<td>Awards</td>
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STAFF

Privat Docent
Pierre VOIROL

Research and Teaching Assistants
Isabelle ANGELSTORF
Christel BRUGGMANN
Anne FOURNIER-HENRY

Administrative Staff
Dominique HUNZIKER

PUBLICATIONS

The Top Ten Journals in the Field (With Impact Factor)

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<tr>
<th>Journal</th>
<th>Impact Factor</th>
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<td>Int. J. Clin. Pharm. (JCP)</td>
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Scientific Publications (With Impact Factor)


PRESENTATIONS

Posters Presentations

1. J.-C. DEVAUD, J. RIEGER, C. LEBLAND, G. PODILSKY, F. SADEGHIPOUR ; Automatisation de la fabrication des TPN par interface Baxa 2400 EM® et Excel® ; JFSPH ; Bern ; 2016

2. I. VICTOROVA, I. ANGELSTORF, A. PANNATIER, F. SADEGHIPOUR, Devenir des études cliniques réalisées au CHUV : Cibles prévues et résultats atteints ; JFSPH ; Bern ; 2016
3. I. ANGELSTORF, L. BOUCHOUD, F. SADEGHIPOUR; Quel est l’attitude des néonatologues et pharmaciens suisses à l’égard de la nutrition parentérale standardisée pour des enfants prématurés ? JFSPH ; Bern ; 2016


5. C. BRÖNNIMANN, M. BERGER-GRYLLAKI, G. PODILSKY, F. SADEGHIPOUR; Optimisation du processus de préparation des solutions de melphalan destinées à l’administration intra-vitréenne dans le traitement de rétinoblastomes et étude de leur stabilité ; JFSPH ; Bern ; 2016


7. A. FEKA, J.C. DEVAUD, F. SADEGHIPOUR; Rôle de l’APUS dans l’optimisation des retours de médicaments à la pharmacie ; JFSPH ; Bern ; 2016

8. M. L. MOTTIER, M. SOMMER, F. SADEGHIPOUR, Qualification d’un système informatisé de monitoring des températures (SIMT) pour sécuriser la gestion des médicaments thermosensibles, Congrès Hopipharm, Clermont-Ferrand, France, 2016

9. M. L. MOTTIER, F. SADEGHIPOUR, Mesurer la performance du management d’une équipe pharmaceutique: pertinence de la création d’un score à partir d’une enquête de satisfaction interne ; Congrès Hopipharm, Clermont-Ferrand, France, 2016 (1er Prix Posters)

10. I. ANGELSTORF, M. GRYLLAKI-BERGER, D. PALMERO, C. FISCHER-FUMEAUX, F. SADEGHIPOUR; Evaluation of the quality of the parenteral nutrition prepared at the neonatal unit; Congrès EAHP, Vienne, Autriche, 2016

**Congresses & Symposia**

1. Comment les hôpitaux francophones font face à la déferlante des produits innovants très couteux, cadre de la Suisse, Hopipharm, Clermont-Ferrand, France, 2016

2. B. TESTA, Seminar, Dept of Clinical Pharmacology, Lausanne University Hospital, 13.10.2016.

**Continuing education & open to the public lectures**


2. F. SADEGHIPOUR; BPF pour les préparations radiopharmaceutiques; Cours agréés par l’OFSP pour techniciens, CHUV, Lausanne, October 2016

3. P. VOIROL; CAS de pharmacie clinique, Module 4 Organisation

4. P. VOIROL; CAS de pharmacie clinique, Spécificités de la pharmacothérapie en soins intensifs ; Geneva, March 2016


6. P. VOIROL; CAS de pharmacie clinique, Futilités des traitements, recherche clinique et compassionate use : quelle place en fin de vie ; Geneva, March 2016


8. P. VOIROL; Cours Société Suisse de Nutrition Clinique, CHUV, Lausanne, September 2016
AWARDS & DISTINCTIONS

Prix du meilleur poster Congrès Hopipharm 2016 ; M. L. MOTTIER, F. SADEGHIPOUR, Mesurer la performance du management d'une équipe pharmaceutique : pertinence de la création d'un score à partir d'une enquête de satisfaction interne ; Congrès Hopipharm, Clermont-Ferrand, France, 2016
**Hospital Pharmacy (HUG)**

**Professor Pascal BONNABRY**

**General description of the Unit**

The HUG hospital pharmacy group works in close collaboration with the CHUV pharmacy and other hospital pharmacies to develop research and education activities in hospital and clinical pharmacy. The undergraduate education is mainly focused on a full course (32 h) of hospital pharmacy dispensed during the 3rd year of the baccalaurean cursus. A postgraduate education (MAS) in hospital pharmacy is also proposed since 1999 on the HUG and CHUV sites, with a collaboration with the Valais hospital. This three years programme is a complete specialization in hospital pharmacy, associating theoretical and practical teachings, as well as a research project. HUG pharmacy also proposes positions for PhD students in pharmaceutical sciences, either for pharmacists having achieved their MAS, or in direct access. The topics are diversified among the research fields described below. For more information: HUG pharmacy: http://pharmacie.hug-ge.ch

**Specific research fields**

**Drug risk management**
- Prospective risk analysis in hospital processes (FMECA method)
- Use of simulation to analyze factors that may influence the rate of preparation and administration errors
- Interests and risks of information technologies in risk management at the hospital.

**Optimization of clinical use of drugs**
- Securing the drug use process in high risk care units
- Detection, prevention, management and evaluation of drug incompatibilities
- Development of decision support, by a clinical pharmacy activity or the dematerialization in computerized systems
- Continuity of care at hospital discharge

**Development of hospital pharmaceutical forms**
- Validation of production processes
- Development of ready-to-use pharmaceutical forms
- Formulation of pediatric parenteral nutritions

**Pharmaceutical analysis**
- Development and validation of generic separation methods for the dosage of active ingredients contained in hospital pharmaceutical formulations.
- Analysis of cytotoxic drugs (quality control and traces in the environment)
- Analysis of monoclonal antibodies

**Pharmacoeconomics and pharmacoepidemiology**
- Analysis of drug use by means of time series methodology
- Modeling the use of antibiotics in relation with the evolution of resistance
- Evaluation of the spill-over effect between the hospital and the community settings
2016 AT A GLANCE

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STAFF

RESEARCH AND TEACHING ASSISTANTS

- Clare BECHET
- Anne-Laure BLANC
- Laurent CARREZ
- Olivia FRANCOIS
- Nicolas GUICHARD

INTERNERSHIP STUDENTS — CO-SUPERVISION (CO-TUTELLE)

- Anne FOURNIER-HENRY
- David PALMERO
- Hanitra RAVELOJAONA

ADMINISTRATIVE STAFF

- Dominique HUNZIKER

RESEARCH FUNDS

INDUSTRY AND ASSIMILATED

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PUBLICATIONS

THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

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SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)


SCIENTIFIC PUBLICATIONS (WITHOUT IMPACT FACTOR)


PRESENTATIONS

POSTERS PRESENTATIONS


**Congresses & Symposia**

1. P. BONNABRY. “Improved quality of medication management helps to reduce medication errors”, Carefusion, Singapore, 2016

2. T. SIGRIST. “Mythe et réalité du pansement alcoolisé ou que faire en cas d’extravasation de produits non cytotoxiques ?”, Dispositifs intraveineux de longue durée (DIVDL), congrès francophone, Paris, 2016


5. P. BONNABRY. “La simulation, ici et ailleurs... “, PEPC, Paris, 2016
13. A. DESNOYER. “Clinical implementation of medication review - screening to supervise effectiveness and appropriateness “, EAHP Academy Seminar, Bucarest, 2016
17. C. FONZO-CHRISTE. “Extravasation de nutrition parentérale “, Journées francophones de nutrition (JFN), Montpellier, 2016

**CONTINUING EDUCATION & OPEN TO THE PUBLIC LECTURES**

1. P. BONNABRY “IT to optimize the medication process at the hospital”, Berner Fachhochschule, Genève, 2016
8. L. BOUCHOUD “Le rôle de la pharmacie dans les essais cliniques“. BPEC, Cours des HUG / Faculté de médecine, Hôpital des Enfants, Genève, 2016
11. P. BONNABRY “LEAN management“, DU de pharmacotechnie, Bordeaux, 2016


**THESIS PRESENTED**

**INTRA-MUROS THESIS**

Olivia FRANCOIS

Delphine CARLI

**RADIO TELEVISION INTERVENTION**

P. BONNABRY
RTS – À bon entendeur, 13 janvier 2016
Dates de péremption des médicaments

P. BONNABRY
RTS – Couleur locales, 9 février 2016
Un robot pour une chimio

P. BONNABRY
RTS – 19:30, 20 juin 2016
Transparence dans les sommes versées par l’industrie pharmaceutique

P. BONNABRY
RTS – Forum, 17 septembre 2016
Erreurs de médication

**AWARDS & DISTINCTIONS**

P. BONNABRY
The overall aim of the Molecular Pharmacology Group’s research is the discovery of vascular biology mechanisms and the development of optimized therapeutic strategies for the treatment of complex disease, mainly cancer. The mainstays of the ongoing research are:

- design of personalized optimization of multidrug combinations,
- identification of novel targets for treatment,
- patient-derived 3D in vitro tumor models,
- cell death mechanisms,
- overcoming acquired resistance of targeted drugs,
- alternative to mammalian screening models,
- nano-systems for co-delivery of multidrug combinations.

We work in a close collaboration with clinicians, engineers, biologists and medical oncologists in order to perform clinically relevant translational research to improve cancer treatment efficacy, reduce side effects and probability of a drug acquired resistance. Our ultimate goal is to develop personalized synergistic combination therapies to the dynamically changing tumor response.

**2016 AT A GLANCE**

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**STAFF**

**POSTDOCTORAL SCHOLARS**

Andrea WEISS

**RESEARCH AND TEACHING ASSISTANTS**

Marloes ZOETEMELK

**ADMINISTRATIVE STAFF**

Danielle COOSEMANS

Dominique HUNZIKER

**RESEARCH FUNDS**

**European Research Council Executive Agency – OPTIM 680209**

Optimized drug combinations for effective cancer treatment : a personalized approach

Requerent : P. NOWAK

Allocation totale : euro 1’199’436.

Allocation 2016 : chf 505’440

Duration : 4 ans

Starting date : 1.6.2016
THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

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<td>Nature Protocols</td>
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<td>Mutation Research</td>
<td>5.49</td>
</tr>
<tr>
<td>Drug Resistance</td>
<td>9.12</td>
</tr>
<tr>
<td>Journal of biological Inorganic</td>
<td>2.53</td>
</tr>
</tbody>
</table>

SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)


Books Chapters


Presentations

Posters Presentations


Oral Presentations

2. P. NOWAK-SLIWINSKA. "Personalized cancer therapy: where are we? " Molecular Therapeutics - Discovery, Development and Delivery, Zermatt, Switzerland, September 6, 2016 (invited talk).
3. P. NOWAK-SLIWINSKA. "Identification of optimal personalized combination therapy for renal cell cancer" - Gordon Research Conference on Personalized Medicine, Hong Kong, July 12, 2016 (invited talk)

Awards

Tony B. Academic Travel Award, SLAS2016, Washington DC, USA and add it to the summary table
Clinical Pharmacology and Toxicology

Professor Jules Desmeules

General Description of the Unit

Our research aims to study the genetic variation of drug responses by evaluating drug transportation and the enzymes involved in the metabolism of xenobiotics such as cytochromes P450 through in vitro (microsomes, cells) or in vivo models (phenotypisation, genotypisation, pharmacokinetic, toxicogenetic and pharmacogenetic clinical and epidemiological studies), and studies related to the safety usage of drugs. The other field developed by the clinical pharmacology and toxicology is directed to studies related to chronic pain and the usage and misusage of analgesics and palliative care.

Specific Research Fields

Current research projects focus on:
1) measuring the impact of pharmacogenomics on drug response focusing mainly in opioids, antiplatelet, antiHIV drugs, oncologic treatments),
2) deveoloping tools to measure the activity of metabolic enzymes, predict therapeutic responses (phenotyping cocktails, PB-PK simulation) and detect drug-drug interactions,
3) evaluating the role of genomics in the assessment of adverse drug reactions
4) deveoloping neurophysiological evaluation methods for testing the efficacy of peripheral and central analgesics (psychometric and neurophysiological-quantitative sensory testing evaluation), for the treatment of acute and chronic pain syndromes.
5) promote synergies between basic sciences and clinical medicine. As such we are engaged in different projects such as Human genomic population structure and phenotype-genotype variation in ADME genes along a latitudinal transect from Africa to Europe in collaboration with the Department of Genetics and Evolution (Estella Polloni). Other collaborations are ongoing with Jean-Charles Sanchez’ group (proteomics analysis of paracetamol hepatotoxicity), the Geneva Platelet group (pharmacogenetics of antithrombotics), Christian Lovis group (phenomic approaches and NLP to detect adverse drug reactions), Marc Ansari’s group (busulfan dose individualization), and psychiatric group (Markus Kosel’s group: prescription in adults with intellectual disabilities), Petros Tsantoulis (molecular tumor board) and Aurelien Thomas’s group (metabolomic approaches), as well as pharmaceutical sciences groups (Serge Rudaz, Gerard Hopfgartner) and the Swiss Center for Applied Human Toxicology (Martin Wilks).

2016 at a glance

| Publication with impact factor                  | 22 |
| Number of projects at FNRS and assimilated     | 5  |
| PhD Thesis presented in 2016                   | 1  |
| Awards                                         | 4  |
| Patents                                        | 2  |
STAFF

SENIOR LECTURERS
Marie BESSON
Christine CEDRASCHI
Youssef DAALI
Monica ESCHER

SENIOR RESEARCH ASSOCIATE
Kuntheavy ING LORENZINI
Val PIGUET
Caroline SAMER
Nicole VOGT-FERRIER
Victoria ROLLASON GUMPRECHT

MASTER STUDENTS PHARMACY
Jonathan FARO
Nour El Houda KARRAY

RESEARCH FUNDS

SWISS NATIONAL SCIENCE FOUNDATION
 Novel approaches to the treatment of chronic pain: translating recent discoveries in pain-related neural plasticity to clinical practice
Applicant: A. Matthey
co-applicant: M. BESSON, Y. DAALI
total funding: CHF 1’800’000
For Geneva: CHF 420’000

SWISS NATIONAL SCIENCE FOUNDATION
 FNRS 32003B_156471/2015-2017 “In vitro and in vivo evaluation of drug-drug interactions between HIV antiretroviral therapies and antiplatelet P2Y12 inhibitors”
Applicant: J. DESMEULES, Y. DAALI, P. FONTANA
total funding: CHF 161’920.

SWISS NATIONAL SCIENCE FOUNDATION
 FNRS 32003B_140783 2013-2015 “Dexamethasone for the treatment of established postoperative nausea and vomiting. A randomised, placebo-controlled, dose-finding”
Applicants: M. TRAMER, C. KERN, J. DESMEULES
total funding: CHF 358’609.

SWISS NATIONAL SCIENCE FOUNDATION
 PNR 67 139304 2014-2017 “Non-medical factors that influence the decision to admit a seriously ill patient to intensive care”
Applicants: M. ESCHER, P. DAYER, P. HUDELSON, M. NENDAZ, T. PERNEGER, B. RICOU
Total funding CHF 233’271

SWISS NATIONAL SCIENCE FOUNDATION
 FNRS 320030_159669 2015-2018 “Human genomic population structure and phenotype-genotype variation in ADME genes along a latitudinal transect from Africa to Europe”
Applicants: E. POLONI, Y. DAALI, J. DESMEULES.
Total funding: CHF 429’000.-
## PUBLICATIONS

### THE TOP TEN JOURNALS IN THE FIELD (WITH IMPACT FACTOR)

<table>
<thead>
<tr>
<th>Journal</th>
<th>Impact Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Pharmacology and Therapeutics</td>
<td>6.28</td>
</tr>
<tr>
<td>Free Radical Biology and Medicine</td>
<td>5.60</td>
</tr>
<tr>
<td>J Allergy Clin Immunol Pract</td>
<td>5.42</td>
</tr>
<tr>
<td>Science of the Total Environment</td>
<td>4.90</td>
</tr>
<tr>
<td>Neuropharmacology</td>
<td>4.70</td>
</tr>
<tr>
<td>Pharmacol Res.</td>
<td>4.39</td>
</tr>
<tr>
<td>Front Pharmacol</td>
<td>4.26</td>
</tr>
<tr>
<td>Toxicology and Applied Pharmacology</td>
<td>3.79</td>
</tr>
<tr>
<td>Platelets</td>
<td>3.21</td>
</tr>
<tr>
<td>Curr Pharm Des</td>
<td>3.13</td>
</tr>
</tbody>
</table>

### SCIENTIFIC PUBLICATIONS (WITH IMPACT FACTOR)


10. **N. VERNAZ, V. ROLLASON, L. ADLERE, C. COMBESCURE, A. PONCET, P. BONNABRY, J. DESMEULES.** Snapshot of the prescribing practice for the clopidogrel and esomeprazole...


**THESIS PRESENTED**

**INTRA-MUROS THESIS**

Ameena JESAIMANI.
The use of internet for health information by hospitalized patients in Switzerland and Qatar
Director : J.-L. VEUTHEY
Co-director : P. DAYER
AWARDS & DISTINCTIONS

Prix de l’Innovation organisé par les HUG et l’Université de Genève : « use of N-desmethylclobazam for neuropathic pain. »

Prix de la meilleure thèse de la Société Suisse de Pharmacologie Clinique (Marija Bosilkovska).

Prix de la meilleure publication dans le domaine de la simulation PBPK offert par SIMCYP; Certara Compagny, Sheffield, UK.

2e Prix OFAC Pharmacy Awards décerné à Amelle SOUKAL étudiante en pharmacie pour son travail de master Développement d’un enseignement concernant l’utilisation des outils d’évaluation de la qualité des sites de santé

BREVETS

2016: Patent application No. PCT/IB2016/051158
"USE OF N-DESMETHYLCOLOBAZAM IN THE TREATMENT OF CHRONIC PAIN DISORDERS AND RELATED METHODS"

Patent application No. PCT/IB2016/051158 Combined Use of oral anticoagulants and related methods
The PhD Program in Pharmaceutical Sciences provides a solid theoretical and practical training in all aspects of the Pharmaceutical Sciences and fosters interdisciplinary research and provides opportunities for scientific exchange via lectures, symposia and networking activities. The PhD Program also aims to increase career opportunities for graduates from the School of Pharmaceutical Sciences.

**PH.D. STUDENTS**

All of the doctoral students in enrolled in the PhD program of the School of Pharmaceutical Sciences are subject to the regulation that stipulates the acquisition of at least 30 credits before the thesis defense can take place. It should be noted that most of the PhD students acquire more than 30 credits indicating their active participation in the PhD program (Tables 1-3). A mean number of 7.3 PhD students attended each course, which indicates a good level of participation. If we consider all of the participants, i.e. including postdocs and pre-grads, this mean value increases to more than 11.3 participants per course. This year was special due to the moving in June of the entire School to the new building and this resulted in the participation rate being a little lower than usual.

The PhD Program commission decided to introduce a new concept of evaluating the progress of the PhD thesis involving the use of a Thesis Advisory Committee or TAC, which takes place 12-15 months after the start of the doctorate. This is organized with the objective of harmonizing levels of excellence for the PhD candidates from the different component disciplines in the School of Pharmaceutical Sciences. This is done with respect to: efficient time-planning and organization of the thesis project; motivation to perform interesting projects and optimization of thesis project progression.

The TAC system is valid for all PhD candidates beginning their thesis from 15th September 2015.

**COURSES AND SYMPOSIA**

In 2016, 21 activities were proposed to the registered PhD students (29, if considering each "conférence sur sujet spécialisé" separately), and 6 had to be postponed or cancelled, mainly due to the moving in June of the whole pharmaceutical sciences section to a new building. A total of 256 hours was given within the 2016 PhD program (including all activities) and level of participation of the PhD students in all five activities of the PhD program in Pharmaceutical Sciences (174 registrations of PhD students) was excellent.

Due to the relocation of the School of Pharmaceutical Sciences to the new CMU building scheduled in June 2016, the PhD Day was postponed until 2017, and will be organized by the students of pharmaceutical biochemistry (FABIP and FAPER groups).

The PhD students also attended the specialized seminars ("conférences spécialisées") proposed within the PhD program; 8 seminars were given by international researchers from academia and industry, for a total of 16 teaching hours. A total of 158 participants attended these lectures including 60 PhD students, 19 post-docs and 79 professors and others (pre-graduates and senior scientists).
The 30th « extra-muros » meeting for Ph.D. students in pharmaceutical sciences was held as usual at the Parkhotel Beausite (Zermatt, VS). It took place from September 5 to 9, 2016 and was organized by Profs. Leonardo Scapozza and Yogeshvar N. Kalia, with the help of Dr Beatrice Kaufmann (doctoral school coordinator), Mrs Florence von Ow (doctoral school secretary) and Mrs Nathalie Goffin. This year meeting was entitled “Molecular Therapeutics – Discovery, Development and Delivery” aka MTD³ and reviewed many aspects of the pharmaceutical sciences, from bench to bedside. Twenty national and international speakers active in academia and industry presented recent trends in various topics, which were divided in four sessions.

During the first session: “NEW TECHNOLOGIES - Changing the paradigm”, fundamental research and discovery applying new technologies in the fields of gene therapy, innovative imaging technologies or molecular dynamics were exposed.

The second session “DISCOVERY – Transforming an idea into a candidate” mainly discussed the strategies used to transform an idea into a candidate for biopharmaceuticals as well as low molecular weight compounds. Besides this, drug discovery institutes were presented, with their opportunities and challenges in a changing pharmaceutical world, and personalized cancer therapies were also briefly covered.

During the third session, entitled “DEVELOPMENT – Making a drug from a lead” the speakers presented some practical examples of means for transforming a compound into a drug.

The fourth session “DELIVERY – Taking basic science to the Patient” included many aspects related to e-Health, personalized medicine approach, and the ways of bringing this fundamental science to the patient and back, through contribution of innovative Community Pharmacy.

The meeting was attended by 69 persons (speakers included). Thirty-two participants came from the EPGL and the University hospitals of Geneva and Lausanne. Administrative people from the research unit and also professors from foreign universities attended too. As usual the meeting was evaluated by the participants. The participants were very satisfied by the scientific content of the program and appreciated the presentations of the speakers. They were very satisfied by the round table, as well as the setup of the meeting. This international “extra-muros” meeting offers PhD students with various opportunities for networking since most of the speakers spent a lot of time for informal discussions outside of the conference room.

The schedule, the content of the courses, hours and credits as well as all indications concerning the PhD program in Pharmaceutical Sciences are stored in a MySQL database and posted dynamically on the web page of the PhD program (http://epgl.unige.ch/pharm/fr/ [Etudes/programme doctoral]).

### Table 1

<table>
<thead>
<tr>
<th>Name of course 2016</th>
<th>Course No.</th>
<th>Course Organizer</th>
<th>Total nb of hours</th>
<th>Credits</th>
<th>Nb of PhD students (total nb of attendees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacie hospitalière et communautaire 1</td>
<td>19H003</td>
<td>P. Bonnabry</td>
<td>18</td>
<td>3</td>
<td>8 (35)</td>
</tr>
<tr>
<td>Pharmacie hospitalière et communautaire 2</td>
<td>19H012</td>
<td>F. Sadeghipour</td>
<td>18</td>
<td>3</td>
<td>6 (26)</td>
</tr>
<tr>
<td>Design drugs with a computer</td>
<td>19H053</td>
<td>A. Daina, V. Zoete</td>
<td>16</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Introduction to pharmaceutical industry: History, structures and Challenges</td>
<td>19H017</td>
<td>D. Hotz</td>
<td>30</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Formulation of protein biopharmaceuticals and drug delivery</td>
<td>19H013</td>
<td>T. Arvinte</td>
<td>20</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Drug discovery: an industrial perspective</td>
<td>19H063</td>
<td>M. Prunotto</td>
<td>18</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Biostatistics in drug development and clinical trials design</td>
<td>19H055</td>
<td>D. Warne, F. Curtin</td>
<td>24</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>
Table 2
List of symposia organized within the PhD Program in Pharmaceutical Sciences 2016 and number of participants.

<table>
<thead>
<tr>
<th>Name of course 2015</th>
<th>Course no.</th>
<th># Course no.</th>
<th>Course organizer</th>
<th>Total nb of hours</th>
<th>Credits</th>
<th># Nb of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhD Day</td>
<td>19H020</td>
<td>Y. Kalia</td>
<td>8</td>
<td>1 or 2</td>
<td>CANCELLED (moving)</td>
<td></td>
</tr>
<tr>
<td>Conférences sur sujets spécialisés</td>
<td></td>
<td></td>
<td>Y. Kalia</td>
<td>8 days (16 hrs)</td>
<td>1,5 for 5 conf.</td>
<td>60 PhD students (158 total)</td>
</tr>
<tr>
<td>30th « extra-muros » meeting, Zermatt</td>
<td>19H025</td>
<td>L. Scapozza / Y. Kalia</td>
<td>5 days (30 hrs)</td>
<td>1 or 2</td>
<td>26 PhD students, 12 post-doc, 16 profs/others</td>
<td></td>
</tr>
</tbody>
</table>

Table 3
List of networking activities organized within the PhD Program in Pharmaceutical Sciences 2016 and number of participants.

<table>
<thead>
<tr>
<th>Name of course 2016</th>
<th>Course no.</th>
<th>Course organizer</th>
<th>Total nb of hours</th>
<th>Credits</th>
<th>Nb of PhD students</th>
</tr>
</thead>
<tbody>
<tr>
<td>L’industrie pharmaceutique se présente *</td>
<td>19H050</td>
<td>Y. Kalia</td>
<td>6</td>
<td>1</td>
<td>CANCELLED</td>
</tr>
<tr>
<td>Career day **</td>
<td>19H007</td>
<td>Y. Kalia</td>
<td>7</td>
<td>1</td>
<td>30</td>
</tr>
</tbody>
</table>

*to be reorganized next year
**the career day of the Faculté des Sciences was proposed to the PhD students.
CONFÉRENCE UNIVERSITAIRE DE SUISSE OCCIDENTALE (CUSO)

The 2016 program as well as the budget were submitted to the CUSO at the end of 2015 and they were duly accepted. The budget in 2016 for the five activities (Seminar Extra-Muros, Conférences spécialisées, Cours, Symposia as well as Networking activities) was 92’000 CHF covered by the funds allocated by the CUSO.

The costs for 2016 for all the activities were 77’565.70 CHF, thus leaving 14’434.30 CHF unused. The difference between the requested budget and the costs was due to cancellation of some events (courses for a total of 11’807.80 CHF), as well as lower expenses for some courses, including "conférences sur sujets spécialisés".

It should be noted that these lower than budgeted expenses for certain activities, freed up funds that could compensate for the budgeted positions for which the expenses were higher than the amounts initially budgeted.

We take the opportunity in this report to thank the CUSO for the past and future financial support allowing us to offer an outstanding program to the PhD students in Pharmaceutical Sciences.