

Dr. François Jean André GAASCHT, PhD

Postdoctoral Research Associate
Schmidt-Dannert Lab
BioTechnology Institute
University of Minnesota
140 Gortner Lab, 1479 Gortner Avenue
Saint Paul, MN 55108, USA
E-mail: fgaascht@umn.edu
Phone (Lab): +1 612-624-7409

Nationality: Luxembourgian

RESEARCH

My research interest is focused on the discovery, the elucidation of the mode of action of natural and natural-based products as well as their promotion as high added-value bioactive compounds, mainly as therapeutic and anticancer agents.

EDUCATION

December 2013 PhD's Degree in Life and Health Sciences, "Doctor Europaeus" label
University of Lorraine (Metz, France)

June 2009 Master's Degree (MSc) in Molecular and Structural Biology
University of Strasbourg (Strasbourg, France)

June 2007 Bachelor's Degree (BSc) in Biochemistry and Molecular Biology
Louis Pasteur University (Strasbourg, France)

WORK EXPERIENCE

October 2016 – Present, Postdoctoral Research associate

Subject: Screening and isolation of antifungal compounds from Basidiomycota.

Main tasks: Building and curation of a large library (> 100) of field collected Basidiomycota strains

Supervisor: Pr. Claudia Schmidt-Dannert (PhD)

University of Minnesota, BioTechnology Institute, Saint Paul, Minnesota, USA

November 2014 – January 2015, Chemist in natural product chemistry

Subject: Apprenticeship within the objectives to acquire solid good basis and new skills in bioactive natural products isolation and identification from microorganisms.

Main tasks: Preparation of extracts from microbial cultures (bacteria and fungi), fractionation of extracts and isolation of natural products by liquid chromatography techniques (CombiFlash, (semi-) preparative HPLC).

Secondary tasks: Structure elucidation of small molecules and natural products from (high-resolution) – MS, 1D and 2D NMR data (H, C, HSQC, HMBC, COSY).

Individual Leonardo da Vinci grant, Lifelong Learning Programme, European Commission

Supervisor: Dr. Fernando Reyes (PhD)

Fundación MEDINA, Centro de Excelencia en Investigación de Medicamentos Innovadores en Andalucía, Granada, Spain

September 2009 – December 2013, PhD Thesis

Subject: Discovery, identification and characterization of molecules from natural origins capable of targeting transduction, proliferation, inflammation and cell death pathways in various cancer cell models.

Main tasks: Analysis of anticancer cytotoxic potential of various natural substances obtained after fractionation of carnivorous plant (*Dionaea muscipula*) extracts.

Secondary tasks: Study of anticancer activities (cytotoxicity, anti-proliferative, NF- κ B pathway inhibition, identification of cell death mechanism, proteasome inhibition, pro-oxidant action,...) and elucidation of cellular mechanisms of action of several natural (flavonoids, fungal compounds,...) and natural-based compounds (flavonoids, coumarin, curcumin derivatives,...).

Grant Marie Curie Action, RedCat Training Network, Initial Training Network (ITN) (Project 215009), European Commission – 7th Framework Programme

Supervisors: Pr. Marc Diederich (PhD)¹ and Pr. Denyse Bagrel (PhD)²

¹Laboratoire de Biologie Moléculaire et Cellulaire du Cancer, Luxembourg, Luxembourg

²Laboratoire d'Ingénierie Moléculaire et Biochimie Pharmacologique, Biology Department, University of Lorraine, Metz, France

June 2011 – August 2011, Secondment taking place within the RedCat Training Network

Main tasks: Learning of natural compounds extraction, sample clean-up and purity analysis and introduction to NMR and mass spectrometry (FT-ICR).

Supervisor: Pr. Gilbert Kirsch (PhD)

Laboratoire d'Ingénierie Moléculaire et Biochimie Pharmacologique, Chemistry Department, University of Lorraine, Metz, France

July 2008 – September 2009, MSc Thesis

Subject: Effect of curcumin on the Wingless (Wnt) pathway in prostate cancer.

Main tasks: Analysis of the effect of the natural compound curcumin on androgen-dependent and independent prostate cancer cell models mainly focused on the Wnt pathway using different recent biological and molecular approaches (cytotoxic analysis, fluorescence microscopy, flow cytometry, transcriptional activity analysis, Western-Blot).

Grant Lions Club Luxembourg – Action “Vaincre le Cancer”.

Supervisors: Pr. Marc Diederich (PhD) and Dr. Marie-Hélène Teiten (PhD)

Laboratoire de Biologie Moléculaire et Cellulaire du Cancer, Luxembourg, Luxembourg

August 2007 - September 2007, voluntary internship

Main tasks: Analysis by Western-Blot of erythroid differentiation marker GATA-1 in leukaemia cancer cells after treatment with valproic acid.

Supervisor: Dr. Franck Morceau (PhD)

Laboratoire de Biologie Moléculaire et Cellulaire du Cancer, Luxembourg, Luxembourg

RESEARCH SKILLS

BIOLOGY:

Cell biology: human cell culture (adherent and suspension cancer cell lines), isolation of human PBMCs (peripheral blood mononuclear cells) from blood (Ficoll), flow cytometry, transfection (transcriptional activity analysis), proliferation and cytotoxic assays (trypan blue, MTT, XTT, luminescent cell viability assay, live cell imaging system), cell death mechanism identification (fluorescence microscopy, flow

cytometry, Western-Blot), proteasome inhibition, glutathione measurement (GSH, GSSG and total), reactive oxygen species (ROS) measurement

Microbiology: preparation of growth media (liquid and solid), bacterial cell culture and inoculation of media, bacterial transformation (for plasmid amplification)

Biochemistry techniques: protein extraction, Western-Blot, gel shift (EMSA)

Molecular biology techniques: RNA and DNA extraction, (reverse transcription, quantitative real-time) PCR

Instrumentation: bright field and fluorescence microscopy, flow cytometer, *IncuCyte* (live-cell imaging system), *Cedex* (automated cell counter system)

CHEMISTRY:

Preparation of extracts: preparation of extracts from microorganism culture broths (fungi and bacteria), maceration, liquid – liquid extraction, Soxhlet extractor, rotary evaporator, centrifugal evaporator, lyophilisation

Isolation of natural products: development of purification methods on analytical HPLC and implementation on semi-preparative and preparative HPLC. Fractionation and isolation of bioactive molecules by flash chromatography (CombiFlash), semi-preparative and preparative HPLC

Structure elucidation: notions in structural elucidation of small molecules and natural products from 1D and 2D NMR (H, C, HSQC, HMBC, COSY) and MS data

TRAINING - WORKSHOPS

The ABC of sequencing and identification of peptides and proteins by mass spectrometry

12th November 2015, Dr. Baptiste Leroy (PhD, University of Mons), Biopark Charleroi Brussels South – Free University of Brussels, Gosselies, Belgium

Practical initiation to tandem mass spectrometry, from gel spot picking and trypsin digestion to protein identification
17th – 18th November 2015, Dr. Baptiste Leroy (PhD, University of Mons), Biopark Charleroi Brussels South – Free University of Brussels, University of Mons, Belgium

BIBLIOGRAPHY

ARTICLES:

Plumbagin modulates leukemia cell redox status. **Gaascht F.**, Teiten M. H., Cerella C., Dicato M., Bagrel D. and Diederich M. *Molecules* (2014), 19, 7, 10011-10032

Novel inhibitors of human histone deacetylases: design, synthesis and bioactivity of 3-alkenylcoumarines. Seidel C., Schnekenburger M., Zwergel C., **Gaascht F.**, Mai A., Dicato M., Kirsch G., Valente S. and Diederich M. *Bioorganic & Medicinal Chemistry Letters* (2014), 24, 16, 3797-801

Embellicines A and B: absolute configuration and NF-kappaB transcriptional inhibitory activity. Ebrahim W., Aly A. H., Wray V., Mandi A., Teiten M. H., **Gaascht F.**, Orlikova B., Kassack M. U., Lin W., Diederich M., Kurtan T., Debbab A. and Proksch P. *Journal of Medicinal Chemistry* (2013), 56, 7, 2991-9

Anti-proliferative potential of curcumin in androgen-dependent prostate cancer cells occurs through modulation of the Wingless signaling pathway. Teiten M. H., **Gaascht F.**, Cronauer M., Henry E., Dicato M. and Diederich M. *International Journal of Oncology* (2011), 38, 3, 603-11

UNBS1450, a steroid cardiac glycoside inducing apoptotic cell death in human leukemia cells. Juncker T., Cerella C., Teiten M. H., Morceau F., Schumacher M., Ghelfi J., **Gaascht F.**, Schnekenburger M., Henry E., Dicato M. and Diederich M. *Biochemical Pharmacology* (2011), 81, 1, 13-23

REVIEWS:

Can one cup of coffee per day keep the cancer away? **Gaascht, F.**, Dicato, M., and Diederich, M. (manuscript in preparation).

Coffee provides a natural multitarget pharmacopeia against the hallmarks of cancer. **Gaascht F.**, Dicato M. and Diederich M. *Genes & Nutrition* (2015), 10, 6, 51

Venus Flytrap (Dionaea muscipula Solander ex Ellis) contains powerful compounds that prevent and cure cancer. **Gaascht F.**, Dicato M. and Diederich M. *Frontiers in Oncology* (2013), 3, 202

Anticancer bioactivity of compounds from medicinal plants used in European medieval traditions. Teiten M. H., **Gaascht F.**, Dicato M. and Diederich M. *Biochemical Pharmacology* (2013), 86, 9, 1239-47

Aurones: interesting natural and synthetic compounds with emerging biological potential. Zwergel C., **Gaascht F.**, Valente S., Diederich M., Bagrel D. and Kirsch G. *Natural Product Communications* (2012), 7, 3, 389-94

Targeting the wingless signaling pathway with natural compounds as chemopreventive or chemotherapeutic agents. Teiten M. H., **Gaascht F.**, Dicato M. and Diederich M. *Current Pharmaceutical Biotechnology* (2012), 13, 1, 245-54

Chemopreventive potential of curcumin in prostate cancer. Teiten M. H., **Gaascht F.**, Eifes S., Dicato M. and Diederich M. *Genes & Nutrition* (2010), 5, 1, 61-74

Approche végétale dans le traitement des leucémies. **Gaascht F.**, Teiten M. H., Schumacher M., Dicato M. and Diederich M. *Correspondances en Onco-hématologie* (2010), V, N°2, 102-108

EDITORIAL:

Natural compounds as inflammation inhibitors. Schumacher M., Juncker T., Schnekenburger M., Gaascht F. and Diederich M. *Genes & Nutrition* (2011), 6, 2, 89-92

POSTERS

New natural compounds of Dionaea muscipula as anticancer agents

F. Gaascht, C. Cerella, M. Jain, M.-H. Teiten, M. Schumacher, G. Kirsch, D. Bagrel, M. Dicato, and M. Diederich
Natural Products and related Redox Catalysts: Basic Research and Applications in Medicine and Agriculture meeting, Aveiro, Portugal, 25-27th November 2012

Natural compounds of Dionaea muscipula as anticancerous agents

F. Gaascht, M.-H. Teiten, C. Cerella, M. Schumacher, M. Jain, M. Dicato, D. Bagrel and M. Diederich
Natural Anticancer Drugs 2012, Olomouc, Czech Republic, 30th June – 4th July 2012

Natural compounds of Dionaea muscipula as anticancerous agents

F. Gaascht, M.-H. Teiten, C. Cerella, M. Schumacher, M. Jain, M. Dicato, D. Bagrel and M. Diederich
Redox and Inflammation signaling 2012, RedCat Meeting on Redox Catalysis from Chemistry to Biology, Luxembourg, 25-27th January 2012

Natural compounds of Dionaea muscipula as anticancerous agents

F. Gaascht, M.-H. Teiten, C. Cerella, M. Schumacher, M. Jain, M. Dicato, D. Bagrel and M. Diederich
International PSE Symposium on “*Phytochemicals in nutrition and health*”, Bari, Italy, 27- 30th September 2011

Anti-proliferative potential of curcumin in androgen dependent prostate cancer cells happens through the modulation of the Wingless signaling pathway

M.-H. Teiten, **F. Gaascht**, M. Cronauer, E. Henry, M. Dicato and M. Diederich
Télévie Séminaire 2010, Bruxelles, Belgium, 7th December 2010

Chemopreventive potential of curcumin on prostate cancer

M.-H. Teiten, **F. Gaascht**, M. Dicato, M. Diederich

15th World Congress on Advances in Oncology and 13th International Symposium on Molecular Medicine
Loutraki, Greece, 7 – 9th October 2010

*Natural compounds of *Dionaea muscipula* as anticancerous agents*

F. Gaascht, M.-H. Teiten, C. Cerella, M. Schumacher, M. Jain, M. Dicato, D. Bagrel and M. Diederich

Corena network, Seminar on Health promoting compounds in plants,
Centre Gabriel Lippmann, Luxembourg, 7th May 2010

Chemopreventive effect of curcumin on the Wingless signaling pathway in prostate cancer cells

M.-H. Teiten, **F. Gaascht**, E. Henry, S Eifes, M Cronauer, M. Dicato, M. Diederich

Inflammation 2010, Luxembourg, 27-30th January 2010

Chemopreventive effect of curcumin on the Wingless signaling pathway in prostate cancer cells

M.-H. Teiten, **F. Gaascht**, E. Henry, S Eifes, M Cronauer, M. Dicato, M. Diederich

Télévie Séminaire 2009, Gembloux, Belgium, 2nd December 2009

ORAL COMMUNICATIONS

*New natural compounds of *Dionaea muscipula* as anticancer agents*

F. Gaascht, C. Cerella, M. Jain, M.-H. Teiten, M. Schumacher, G. Kirsch, D. Bagrel, M. Dicato, and M. Diederich

Natural Products and related Redox Catalysts: Basic Research and Applications in Medicine and Agriculture
meeting, Aveiro, Portugal, 25-27th November 2012

*Natural compounds of *Dionaea muscipula* as anticancer agents*

F. Gaascht, M. Jain, M.-H. Teiten, M. Schumacher, D. Bagrel, M. Dicato, and M. Diederich

BIOPROLOR/CORENA seminar, Nancy, France, 20th October 2010

APC is essential for targeting phosphorylated β -Catenin to the SCF ^{β -TrCP} ubiquitin ligase and personal research
presentation: *Chemopreventive effect of curcumin on the Wingless signaling pathway in prostate cancer cells*

Journal Club, Hôpital Kirchberg, Luxembourg, Grand Duchy of Luxembourg, 20th October 2009

TRAINING SUPERVISION

Supervision of several young trainees (15 – 17 years old) during short-length introductory internships (1 - 2 weeks).

POPULAR SCIENCE COMMUNICATIONS

WEBSITES:

From September 2009 to January 2014, creation, design and maintenance of websites and Facebook pages for two non-profit associations supporting scientific research in Grand Duchy of Luxembourg: Recherches Scientifiques Luxembourg, asbl (<http://www.rsl.lu>) and Fondation Recherche Cancer et Sang (<http://www.fondationrecherchecancer.lu>).

Creation, design and maintenance of a website for the annual or biennial scientific meeting (Inflammation 2010, Cell Signal-omics 2011, RedCat meeting 2012, Metabolism 2014) organized by Recherches Scientifiques Luxembourg, asbl in Luxembourg (<http://www.transduction-meeting.lu>).

FLYERS:

Creation and design of a flyer to collect money for a non-profit association supporting scientific research in Grand Duchy of Luxembourg and a second flyer to inform new parents about cord blood donation for scientific research against cancer.

POSTERS:

Creation and design of several posters to inform people about cancer and chemoprevention with natural compounds (European Researchers' Night, charity sales,...).

EVENT MANAGEMENT & ORGANIZATION

SCIENTIFIC EVENTS:

Member of organizing and management committee and webmaster (<http://www.transduction-meeting.lu>) of small and worldwide scientific meetings (10 – 800 participants) organized in Luxembourg: Inflammation 2010, OSCAR RedCat meeting (October 2010), Cell Signal-omics 2011, RedCat meeting 2012, Metabolism 2014.

POPULAR SCIENCE EVENTS:

Member of organizing committee and workshops running: European Researchers' Night (2009 and 2010), Boys' Day (2010, 2012), school group visits, laboratory open days.

BUSINESS NETWORKING

From September 2009 to December 2013, promotion of the services, know-how and experience of the Laboratoire de Biologie Moléculaire et Cellulaire du Cancer (LBMCC) in the aim to develop new partnerships and collaborations in the field of bio-characterization of natural-related compounds as anti-cancer agents during events, meetings and by oral, visual and electronic formats (presentations, flyers, posters, internet dissemination).

GRANTS AND FUNDINGS

Individual travel grant, Marie Curie Alumni Association (MCAA), annual meeting in Porto (Portugal), February 2015, 400 euros

Individual Leonardo da Vinci Grant, TransEurope Programme, European Commission, Granada (Spain), November 2014 – January 2015, 3.000 euros

Individual travel grant, Marie Curie Alumni Association (MCAA), association-founding meeting in Brussels (Belgium), November 2013, 200 euros

Early stage researcher fellowship, Marie Curie Action Grant, RedCat Initial Training Network (215009), 7th Framework Programme, European Commission, September 2009 – November 2012, 100.000 euros

Individual grant Lions Club Luxembourg, Action "Vaincre le Cancer" – Lions Club, September 2008 – August 2009, 18.000 euros

MEMBERSHIPS

Marie Curie Alumni Association (MCAA) and associate founding member of the MCAA BeNeLux Chapter

Founding manager of the MCAA – Natural Products Group

European Biotechnology Network

European Federation of Biotechnology

Alumni Association – University of Strasbourg (France)

COMPUTER SKILLS

Operating systems: Windows, Mac OS X and Ubuntu (Linux)

Microsoft office: Word, Excel, and PowerPoint

Image processing software: Image J, Gimp, Photoshop

Reference management software: EndNote, Mendeley

Science-related software: FlowJo, Quantity One, Primer 3, ACD/NMR Processor

Molecule editors: MarvinSketch, ChemDraw

Website creation: Dreamweaver, html 5 and CSS 3 languages (self-learning website creation)

Desktop publishing software (creation and design of flyers, posters, folders): InDesign

LANGUAGES

French: mother language

English: good level

Spanish: notion

Dutch: notion