Matthieu Rouffet, Ph.D.

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EDUCATION

Ph.D., Organic Chemistry, School of Pharmacy of Reims, France, with highest honors — December 2008
Dissertation: *"Synthesis, biological evaluation and determination of the mode of binding of sulfonylhydrazides as MMP inhibitors"*
Advisor: Pr. Dominique Guillaume

M.S., Organic Chemistry, University of Reims, France, with Honors — June 2005
B.S., Chemistry, University of Reims, France, with Honors — 2000-2004

EXPERIENCE

Associate Professor, Point Loma Nazarene University, CA — 2014-present
Assistant Professor, Point Loma Nazarene University, CA — 2011-2014

Teaching:
- Introduction to General, Organic and Biological Chemistry (CHE103)
- Bioinorganic chemistry (CHE466)
- Physical Science (PSC110)
- Senior Seminar (CHE 495)
- Organic Chemistry laboratories (CHE 304)
- General Chemistry laboratories (CHE 153)
- Physical Science laboratories (PSC 110L)
- Introduction to General, Organic and Biological Chemistry laboratories (CHE103L)

Scholarship of Discovery:
- Conduct a 10-week summer research program where undergraduate students are mentored and trained to perform medicinal chemistry research. More specifically, I manage three different projects:
  1- We are designing and synthesizing Anthrax lethal factor inhibitors containing a novel Zinc Binding Groups in collaboration with the SSGCID
  2- We are collaborating with Northern Illinoi University to develop inhibitors of IspF which can lead to novel antibiotics
  3- We are synthesizing a methotrexate prodrug derivative in an anti-cancer treatment called ADEP therapy in collaboration with Dr. Dorrell's laboratory in the Biology department at PLNU

- Mentored and trained 12 undergraduate and 2 high school students

- Received Funding from the Research Corporation for Science Advancement to fund the Anthrax lethal factor project ($55,000 for 2014-2016)

Service:
- WASC steering Committee — 2015-present
- Faculty Council — 2015-present
- Chemistry Club advisor — 2013-present
- Worship leading for faculty and student's chapel — 2012-present
- Science Faculty Learning Community (FLC) leader — 2012-present
- Rank and Tenure Committee — 2014-2016
- Spiritual life committee — 2011-2014

Post-Doctoral Associate, University of California San Diego, CA 2009-2011

Challenges: - Synthesize inhibitors of pharmaceutically relevant metalloenzymes based on known zinc sensors and novel metal binding groups using a Fragment Based Drug Design approach

Actions: - Design and synthesize Matrix metalloproteases (MMP) and Lethal Factor (LF) sulfonamide fragment libraries (> 150 molecules) using a microwave reactor
- SAR using computational protein-ligand docking to improve potency and selectivity (Glide, Maestro)
- Perform different enzymatic assays and calculate IC_{50} values

Results: - Discover selective low micromolar hits against MMP and Lethal Factor
- Publish 4 articles in peer reviewed journals

Graduate Researcher, School of Pharmacy, Reims, FRANCE 2005-2008

Challenges: - Improve the potency and selectivity of Ilomastat and study the sulfonylhydrazide function as a new zinc-binding group. Total synthesis of three natural products

Actions: - Convergent strategy involving 17 steps and different peptide couplings
- DFT study of the sulfonylhydrazide function and its ability to chelate zinc
- Synthesis of a dibenzofuran backbone via palladium-catalyzed heteroannulation

Results: - Synthesized the target molecule and improved selectivity for MMP-9
- Discovered a one pot reaction for the synthesis of tetrahydropiperazine-3,6-diones
- Publish 2 articles in peer reviewed journals

Undergraduate Researcher, University of York, UK 2004

Project: - Modification of the surface of Alumina for the synthesis of hybrid organic-inorganic bases
- Green chemistry research

PUBLICATIONS and PATENTS

8. Perez, C.; Li, J.; Parlati, F.; **Rouffet, M**.; Ma, Y.; Mackinnon, A, L,; Chou, T,; Deshaies, R, J.; and Cohen, S. M. "Discovery of an Inhibitor of the Proteasome Subunit Rpn11." *J. Med. Chem*., **2017**, accepted

7. Zhou, H.; Parlati, F.; **Rouffet, M**.; Emberley, E.; Deshaies, R. J.; Cohen, S. M. "Compositions and methods for jamm protein inhibition." **2014**, US 20140235548 A1 (patent)

6. Tanakit, A.; **Rouffet**, **M**.; Martin, D. P. and Cohen, S. M, "Investigating chelating sulfonamides and their use in metalloproteinase inhibitors", *Dalton Trans*., **2012,** *41*, 6507.

5. **Rouffet, M.** and Cohen, S. M., "Emerging trends in metalloprotein inhibition", *Dalton Trans*., **2011,** *40*, 3445.

4. Martin, D. P.; **Rouffet**, **M**. and Cohen, S. M. "Illuminating Metal Ion sensors Benzimidazolesulfonamide metal complexes." *Inorg. Chem*., **2010**, *49*, 22, 10226–10228

3. **Rouffet, M**.; De Oliveira, C. A. F.; Udi, Y.; Agrawal A.; Sagi, I.; McCammon, J. A. and Cohen, S.M. "From Sensors to Silencers: Quinoline- and Benzimidazole-Sulfonamides as Inhibitors for Zinc Proteases." *J. Am. Chem. Soc*., **2010**, *132*, 8232–8233

2. **Rouffet, M**. ; Denhez, C.; Bourguet, E.; Bohr, F. and Guillaume, D. "In silico study of MMP inhibition." *Org. Biomol. Res*., **2009**, *7*, 18, 3817-3825

1. LeDour, G.; Moroy, G.; **Rouffet, M**.; Bourguet. E.; Guillaume, D.; Decarme, M.; ElMourabit, H.; Augé, F.; Alix, A.J.P.; Laronze, J.Y.; Bellon, G.; Hornebeck, W. and Sapi, J. "Introduction of the 4-(4-bromophenyl)benzenesulfonyl group to hydrazide analogs of Ilomastat leads to potent gelatinase B (MMP-9) inhibitors with improved selectivity." *Bioorg. Med. Chem*., **2008**, *16*, 8745–8759

PRESENTATIONS

9. Abass, G.; Elson, D.; Dorrell, M.; **Rouffet, M.** "Towards the synthesis of MTX-phenylalanine derivatives for the treatment of glioblastoma in antibody-directed enzyme prodrug therapy" American Chemical Society National Meeting, San Diego, **2016**. (Poster)

8. Voss, C. L.; **Rouffet, M**. "Design and Synthesis of 2-(2-sulfonamido)phenylbenzimidazole Derivatives as Potential IspF Inhibitors." American Chemical Society National Meeting, San Diego, **2016**. (Poster)

7. Kay, C. R. S.; **Rouffet, M**. "Synthesis of 2-(2-sulfonamidophenyl)benzothiazole and 2-(2-sulfonamidophenyl)benzimidazole as potential inhibitors of anthrax lethal factor and other zinc metalloenzymes." American Chemical Society National Meeting, Denver, **2015**. (Poster)

6. Steinhaus, M.; Reader, J.; **Rouffet, M**.; Aldrich, T.; Rolshausen, P.; Roper, C. M.; Maloney, K. "Synthesis of derivatives of the natural product radicinin that inhibit the plant pathogen Xylella fastidiosa" American Chemical Society National Meeting, Denver, **2015**. (Poster)

5. Carlson, A. L.; Quick, C.; **Rouffet, M**. "Synthesis of anthrax lethal factor inhibitors using a novel potent and selective zinc binding group." American Chemical Society National Meeting, New Orleans, **2013**. (Poster)

4. **Rouffet, M**.; Martin, D.; Cohen S. M.; "Novel Metal chelator Fragments for the design of Metalloenzyme inhibitors." Fragment Based Ligand Discovery (FBLD) conference, Philadelphia, **2010**. (Poster)

3**. Rouffet, M**.; Cohen S. M.; "Synthesis of Quinolin-8-yl-sulfonamides and 2-Sulfamidophenyl-benzimidazole Libraries as MMP Inhibitor Leads." American Chemical Society National Meeting, Washington DC, **2009**. (Poster)

2. Holtz, C. T.; **Rouffet, M**.; Jacobsen, F.; Cohen, S. M.; "Toward Mixed Nitrogen and Sulfur Based MMPi." 41st Annual Western Regional American Chemical Society Meeting **2007**. (Poster)

1. **Rouffet, M**.; Bourguet, E.; Guillaume, D.; "Towards the Synthesis of illomastat derivatives." Regional meeting, Reims, **2006**. (Oral)

HONORS

PhD scholarship from the Region of Champagne-Ardennes (France) 2005-2008
Received my PhD with highest honors and congratulation from the Jury

Master of Science merit scholarship 2004-2005

AFFILIATION

American Chemical Society 2009-present

French Chemical Society (SFC) 2005-2008