

Stéphane P. Roche, Ph.D.

Florida Atlantic University (FAU)
Department of Chemistry and Biochemistry
777 Glades Road,
Boca Raton, FL 33431

Office Phone: 297-561-3580
Cell: 407-430-2247
Email: sroche2@fau.edu
Website: <http://www.rocheresearchgroup.com/>

BORN: November 15, 1979 in France (US permanent resident)

MAIN PROFESSIONAL INTERESTS

Synthetic Organic Chemistry, Reaction Design, Natural Product Synthesis, Biomimetic Synthesis, Chemical Biology and Drug Discovery.

APPOINTMENTS

2011 – Present Assistant Professor.
Department of Chemistry and Biochemistry; FAU.
2015 – Present Faculty Member.
Center for Molecular Biology and Biotechnology; FAU.

EDUCATION

2008 – 2011 Postdoctoral Associate.
Boston University, Chemistry Department, Massachusetts, USA.
Advisor: Prof. J. A. Porco Jr.
2006 – 2008 Postdoctoral Associate.
@-STAR Institute of Chemical and Engineering Sciences (ICES) at Biopolis, Singapore.
Advisor: Prof. K.C. Nicolaou
2002 – 2006 Ph.D. in Organic chemistry.
Blaise Pascal University, Clermont-Ferrand, France, **2006**.
Advisor: Prof. David J. Aitken
2000 – 2002 M.S. in Organic Chemistry.
Blaise Pascal University, Clermont-Ferrand, France, **2002** (ranking: 1st out of 30)
Advisor: Prof. S. Giorgi-Renault (University René Descartes, Paris V)
1997 - 2000 B.S. with Honors in Chemistry.
Blaise Pascal University, Clermont-Ferrand, France, **2000** (ranking: 4th out of 49)

AWARDS

2002 – 2005 French Government Merit Grant (Full scholarship for the PhD)
2006 – 2007 Postdoctoral Fellowship (SFC Auvergne; French Chemical Society)
2012 Mentor and Mentee FAU Award with Prof. S. Lepore
2014 Mentor and Mentee FAU Award with Prof. S. Lepore

MEMBERSHIPS

2002 – 2006 SFC (French Chemical Society)
2009 – Present ACS (American Chemical Society)
2016 – Present AHA (American Heart Association)

PUBLICATIONS & PATENTSList of Independent Publications (names of FAU undergraduate coauthors are underlined)

1. Zorc, S.; Desaunay, O.; Samanta, S. S.; **Roche***, **S. P.** proposed *Org. Lett. or Tetrahedron Lett.* **2017** (*manuscript in preparation: 50-70% finalized*) "A Highly Diastereoselective Modified Hantzsch-4CR for the Synthesis of Unsymmetrical Tricyclic Dihydropyridines."
2. Samanta, S. S.; **Jacobsen***, **E. N.**; **Roche***, **S. P.** *Org. Lett. or ACS Catal.* **2017** (*manuscript in preparation: 90% finalized*) "Synthesis and Reactivity of α -Haloglycine Esters: Hyperconjugation in Action."
3. Kinder, T. B.; Dranchak, P.; Coley, W. D.; Jeedimalla, N.; **Roche***, **S. P.**; **Inglese***, **J.**; **Kanneboyina***, **N.** proposed *ACS Med. Chem. Lett.* **2017** (*finalized manuscript*) "Quantitative High Throughput Screen to Discover Compounds that Increase AMP Deaminase Expression in Skeletal Muscle"
4. Scesa, P.; Wangpaichitr, M.; Savaraj, N.; West*, L.; **Roche***, **S. P.** *Angew. Chem. Int. Ed.* (communication) *work submitted under revision* **2017** "Kinetic Dearomatization Strategy for an Expedient Route to Bielschowskysin core"
5. Samanta, S. S.; **Roche***, **S. P.** *J. Org. Chem.* (full article) *Accepted* **2017**. "In Situ-Generated Glycinyll Chloroaminals for a Versatile One-Pot Synthesis of Non-Proteinogenic α -Amino Esters"
6. Hall, A.; **Roche***, **S. P.**; **West***, **L.** *Org. Lett.* **2017**, *19*, 576–579. "Synthesis of Briarane Diterpenoids: Biomimetic Transannular Oxa-6 π electrocyclization Induced by a UVA/UVC Photoswitch." PMID: 28080074
7. **Roche***, **S. P.**; Youte Tendoung, J.-J.; Tréguier, B.; *Tetrahedron* **2015**, *71*, 3549–3591. "Advances in dearomatization strategies of indoles"
8. Jeedimalla, N.; Flint, M.; Smith, L.; Haces, A.; Minond, D.*; **Roche***, **S. P.**; *Eur. J. Med. Chem.* **2015**, *106*, 167–179. "Multicomponent Assembly of 4-Aza-podophyllotoxins: A Fast Entry to Highly Selective and Potent Anti-Leukemic Agents". PMID: 26547055
9. Tréguier, B.; **Roche***, **S. P.** *Org. Lett.* **2014**, *16*, 278–281. "A Double Annulative Cascade of Tryptophan Containing Peptides Triggered by Selectfluor[®]" PMID: 24328461
10. **Roche***, **S. P.**; Samanta, S. S.; Gosselin, M. M. *J. Chem. Commun.* **2014**, *50*, 2632–2634. "Autocatalytic One Pot Orchestration for the Synthesis of α -Arylated α -Amino Esters." PMID: 24471165
11. Wasa, M.; Liu, R. Y.; **Roche***, **S. P.**; **Jacobsen***, **E. N.** *J. Am. Chem. Soc.* **2014**, *136*, 12872–12875. "Asymmetric Mannich Synthesis of α -Amino Esters by Anion-Binding Catalysis" PMID: 25178040
12. Jeedimalla, N.; Johns, J.; **Roche, S. P.*** *Tetrahedron Lett.* **2013**, *54*, 5845–5848. "Mechanistic Investigation and Implications of a Sacrificial Aniline for the Tandem Cascade Synthesis of 4-Aza-podophyllotoxin Analogues."

List of Doctoral and Postdoctoral Publications

13. Santagata, S.; Mendillo, M. L.; Tang, Y.-C.; Perley, C. C.; **Roche, S. P.**; Kwon, H.; Koeva, M.; Subramanian, A.; Golub, T. R.; Amon, A.; Porco Jr., J. A.; Whitesell *, L.; Lindquist *, S. *Science* **2013**, *341*, 250–260. "Tight coordination of protein translation and heat shock factor 1 activation supports the anabolic malignant state." PMID: 23869022
14. Lajkiewicz, N. J.; **Roche, S. P.**; Gerard, B., Porco Jr. *, J. A. *J. Am. Chem. Soc.* **2012**, *134*, 13108–13113. "Enantioselective Photocycloaddition of 3-Hydroxyflavones: Total Syntheses and Absolute Configuration Assignments of (+)-Ponapensin and (+)-Elliptifoline". PMID: 22804454
15. Rodrigo, C. M.; Cencic, R.; **Roche, S. P.**; Pelletier*, J.; Porco Jr. *, J. A. *J. Med. Chem.* **2012**, *55*, 558–562. "Synthesis of Rocaglamide Hydroxamates and Related Compounds as Eukaryotic Translation Inhibitors: Synthetic and Biological Studies". PMID: 22128783
16. **Roche, S. P.**; Porco Jr.*; J. A. *Angew. Chem. Int. Ed.* **2011**, *50*, 4068–4093. **Review**. "Dearomatization Strategies in Complex Natural Product Synthesis"

17. Porco Jr., J. A.; Pelletier, J.; **Roche, S. P.**; Cencic, R.; Rodrigo, C. *PCT Int. Appl.* (2011), WO 2011140334 A2 20111110 **Patent**
18. Teysstot, M-L.; Jarrousse, A-S.; Manin, M.; Chevy, A.; Roche, S.; Norre, F.; Beaudoin, C.; Morel, L.; Boyer, D.; Mahiou, R.; Gautier*, A. *Dalton Trans.* **2009**, 6894–6902. “Metal-NHC complexes: a survey of anti-cancer properties”.
19. **Roche, S. P.**; Teysstot, M-L.; Gautier*, A. *Tetrahedron Lett.* **2010**, 51, 1265–1268. “Synthesis of 1,2 Diamines under Environmentally Benign Conditions: Application for the Preparation of Imidazolidiniums”
20. **Roche***, **S. P.**; Aitken*, D. J. *Eur. J. Org. Chem.* **2010**, 5339–5358. **Review.** “Chemistry of 4-Hydroxy-2-cyclopentenone derivatives”. *Joined corresponding author*
21. **Roche, S. P.**; Cencic, R.; Pelletier, J.; Porco, Jr.*, J. A. *Angew. Chem. Int. Ed.* **2010**, 49, 6533–6538 “Biomimetic Photocycloaddition of 3-Hydroxyflavones: Synthesis and Evaluation of Rocaglate Derivatives as Inhibitors of Eukaryotic Translation”. PMID: 20687060
22. Faure*, S.; Hjelmgard, T.; **Roche, S. P.**; Aitken*, D. J. *Org. Lett.* **2009**, 11, 1167–1170. “Passerini Reaction-Amine Deprotection-Acyl Migration Peptide Assembly: Efficient Formal Synthesis of Cyclotheonamide C”. PMID:1 9203293
23. **Roche, S. P.**; Faure, S.; Aitken*, D. J. *Angew. Chem. Int. Ed.* **2008**, 47, 6840–6842. “Total Synthesis of Cyclotheonamide C using a Tandem Backbone-Extension–Coupling Methodology”. PMID: 18661464
24. **Roche, S. P.**; Faure, S.; El Blidi, L.; Aitken*, D. J. *Eur. J. Org. Chem.* 2008, 30, 5067–5078. “Total Synthesis of Cyclotheonamide C by Use of an α -Keto Cyanophosphorane Methodology for Peptide Assembly”.
25. Nicolaou*, K. C.; Majumder, U.; **Roche, S. P.**; Chen*, D. Y.-K. *Angew. Chem. Int. Ed.* **2007**, 46, 4715–4718. “Construction of the “Left Domain” of Haplophytine”. PMID: 17559182
26. Aitken*, D. J.; Faure, S.; **Roche, S.** *Tetrahedron Lett.* **2003**, 44, 8827–8830. “Synthetic approaches to the Southern Part of Cyclotheonamide C”.

Poster Presentations at National & International Meetings:

1. "Integration of a novel Green Chemistry experiment, using a visible light photocatalyst, into the Organic Chemistry lab at Florida Atlantic University " Beckwith, D.; Roche, S. P.; Rezler, E. M. Poster presented at the 245th American Chemical Society National Conference, April **2013**, New Orleans, LA, USA.
2. "Integration of a Novel Green Chemistry Experiment into the Organic Chemistry Lab at Florida Atlantic University" Beckwith, D.; Roche, S. P.; Rezler, E. M. Poster presented at the 43rd National Organic Chemistry Symposium, June **2013**, Washington, OR, USA.
3. "Asymmetric House-Meinwald rearrangement of spiro-epoxide: A unified biomimetic approach to liphagal and frondosin analogues" Jeedimalla, N.; Roche, S. P.. Poster presented at the 21st International Conference on Organic Synthesis (ICOS), December **2016**, IIT Bombay, India.
4. "Revisiting a photochemical, biomimetic hemisynthesis strategy towards bielschowskysin" Scesa, P.; West, L. M.; Roche, S. P.. Poster presented at the 21st International Conference on Organic Synthesis (ICOS), December **2016**, IIT Bombay, India.

INVITED PROFESSIONAL TALKS

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|---------|----------------------------------------------------|
| 11/2016 | Northeastern University |
| 11/2016 | Boston College |
| 11/2016 | Boston University |
| 09/2015 | PacifiChem 2015; Hawaii |
| 08/2009 | 238 th ACS meeting; Washington D.C. |
| 03/2008 | UK-Singapore symposium; Singapore |
| 09/2007 | @-STAR-Noyori 1 st symposium; Singapore |

RESEARCH GRANTS AWARDED & PENDINGCurrent Research Support**1R15GM116025-01** Roche (Role: **PI**) 09/2016 – 08/2019**Direct cost: \$ 292,000 (TOTAL AWARD: \$ 432, 869)***“Asymmetric Synthesis of Unnatural α -Amino Acids: Applications to Natural Products”* [link](#)

This grant focused on undergraduate student training and exposure to research in peptide chemistry. The project entails the development of a novel synthetic strategy for the asymmetric synthesis of non-proteinogenic α -amino acids and the most peculiar and challenging α,α -disubstituted α -amino acids. The central application resides in the synthesis of two natural products: sorbicillactone A, which has a promising anti-leukemia activity ($IC_{50} = 0.5 \mu M$) and fumimycin which has antibacterial activity via peptide deformylase (PDF) inhibition.

FAU-Technology Grant Roche (Role: **PI**) 2017-2018**Direct cost: \$ 147,800***“Acquisition of an NMR-400 MHz to Foster the Next Generation of Skilled STEM Students from FAU”*

The proposal was awarded for the active involvement of undergraduate students in Chemistry in independent research (CHM 4905) in practical training in applying NMR to their systems of interest. The acquisition of the NMR instrument will afford an “OPEN” access to the 400 MHz MR to students to streamline their research projects and enhance their analytical skill to forge a better chemistry-based workforce for the biomedical community in South-Florida.

Pending Research Support:**NIH-R21** Roche (Role: **PI**) 07/2017 – 06/2019**Direct cost requested: \$ 275,000***“Inhibition of PCSK9 Transcription, A Small Molecule Approach to Lowering LDL-Cholesterol.”*

Atherosclerosis is the underlying disease responsible for the majority of cardiovascular diseases, including stroke and myocardial infarction. Proprotein Convertase Subtilisin-Kexin type 9 (PCSK9) is a protease that regulates LDL-cholesterol blood levels, which is a crucial target checkpoint to mitigate atherosclerosis. The question we want to address with this proposal is whether drug-like small molecules of different structural chemotypes can be developed to selectively inhibit PCSK9-gene transcription, and determine how the mechanism of activation of the PCSK9-gene can be alleviated by these small molecules.

Grant scored (28 percentile; IS: 44)

American Cancer Society Roche (Role: **PI**) West (Role: **Co-PI**) 01/2018 – 12/2021**Direct cost requested: \$ 644,620** (Research Scholar Grant)*“Targeting Lung Cancer: New Chemotypes Inspired by Natural Product Scaffolds.”*

Lung cancer is the most common malignancy worldwide and the leading cause of death from all cancers in the United States. Yet, with the treatments currently available, the 5-year survival rate for lung cancer patients is of only 15%. The question we want to address with this proposal is whether the natural product bielschowskysin ($GI_{50} < 10 \text{ nM}$; EKVX cells) and a library of analogs can be synthesized and further diversified in quantities that will enable us to determine the molecule's pharmacophore(s) and the possible mechanism(s) of action against NSCLC.

Volo Foundation Roche (Role: **PI**) West (Role: **Co-PI**) 10/2017 – 09/2018**Direct cost: \$ 50,000** (renewable yearly based on project's advancement)*“Aquaculture of P. acerosa for the scalable production of cembranoid secondary metabolites”*

This grant focused on establishing an aquaculture protocol for P. acerosa at the FAU facility (Gumbo Limbo) and a feasibility study for seasonal harvesting and isolation of secondary metabolites.

PROFESSIONAL ACTIVITIES

Editorial Board Member: Review Editor for Modern Synthetic Organic Chemistry; Frontiers in Chemistry UK) 2017–
Created and managed the FAU-SCRIPPS internship program, 2015 – Present

Established an internship program with the top engineering schools of chemistry in France 2012 – Present

Seminar Coordinator at FAU, Department of Chemistry and Biochemistry “ChemImpact Series” 2013 – 2015

Eli Lilly collaborator ([OIDD program](#)) and our compound library proposal was selected for the Automated Laboratory Synthesis ([ASL](#))

Manuscript Reviews

Nature Scientific Report (1 manuscript)
Eur. J. Med. Chem. (2 manuscripts)
J. Am. chem. Soc. (3 manuscripts)
Org. Lett. (3 manuscripts)

Adv. Synth. Cat. (2 manuscripts)
Tetrahedron Lett. (3 manuscripts)
J. Org. Chem. (3 manuscripts)
Beilstein J. Org. Chem. (2 manuscripts)

Proposal Reviews

National Institute of Health (3 proposals)-2016

GRIP Grants at FAU (3 proposals-2015)

TEACHING EXPERIENCE at FAU

Undergraduate Courses

- CHM 2210 - Organic Chemistry I (taught 6 semesters, ~ over 1,800 students)
- CHM 4220 - Organic Chemistry III (taught 2 semesters, 24 students)

Graduate Courses

- CHM 6225 - Advanced Organic Chemistry (*new course developed*, taught 1 semester, 8 students)
- CHM 6157 – Instrumentation (taught 1 semester, 16 students)
- CHM 6380 – Topics in Stereochemistry (*new course developed*, taught 2 semesters, 18 students)

STUDENTS PLACEMENT

Our research group has an excellent placement record for group members. Past Postdoctoral fellows and undergraduate students hold academic and industrial positions:

Postdoctoral Fellows: (*1 full postdoc term: Dr. Tréguier; currently 1 postdoctoral fellow from NIH(R15): Dr. Zaghouani 2017-2019*)

- Dr. Jean-Jacque Youte Tendoung (**6 months at FAU:** funder and CEO of a start-up company in France StrainChem for custom synthesis (<http://www.strainchem.com/>))
- Dr. Gregory Boyce (**6 months at FAU:** Assistant Professor of Chemistry at Florida Gulf Coast University)
- Dr. Koushik Goswami (**6 months at FAU:** Lecturer at the Indian Institute of Technology (IIT) Kharagpur)
- Dr. Bret Tréguier (**2 years at FAU:** Lecturer in France (CNRS, Maître de conference, Université de Rouen))

UG Students: (*28 UG students total; 10 students from France, 4 UG are currently working in the lab*)

- Ms. Rhonda Penn (2 semesters 2011-12), **position:** analytical chemist (Fibertec Inc., Michigan)
- Ms. Jennifer Johns dismissed from the MS program (2 semesters 2012-2013), **position:** formulation chemist position at GoodCat Laboratories (Florida)
- Ms. Donella Beckwith (as Co-PI with Dr. Rezler; 2 semesters 2012-2013), **position:** joined the Chemistry graduate program for a PhD at FAU.
- Ms. Madison Flint (6 semesters 2011-13; FAU-UG grant awarded 2012), **position:** joined the Chemistry graduate program for a PhD at UF in 2014, awarded with the prestigious graduate school fellowship affording her a full salary for 4 years of research assistantship.
- Mr. Aleem Khan (2 semesters 2014), **position:** MD-PhD program at Boston University (Fall 2015-present).
- Mr. Stephen Zorc (Honors program: 4 semesters 2014-15; FAU-UG grant awarded 2014), **position:** already accepted to several medical schools, Stephen is trying to enter a MD-PhD program. Stephen graduated in 3 years from FAU and he is now working at the NIH to build his CV to apply for MD-PhD programs at Boston University or Stanford.
- Mr. Thomas Kempton (3 semesters 2015-2016; FAU-UG grant awarded 2015) **position:** analytical chemist at ChemPep (peptide purification)
- Ms. Sasha Guslyayev (1 semester 2016; FAU-UG grant awarded 2016). Sasha is still at FAU.
- Ms. Margaret Whims (2 semesters 2016)

- Mr. Reyes, Ms. Ramos, Ms. Muratet, Ms. Jutte and Ms. Taylor are still at FAU.
- *4 Current members:* Mr. Charles Shearer (Honors program; FAU-UG grant awarded 2016), Ms. Aya Talmason (FAU-UG grant 2016) already accepted into the MD-PhD program at FAU, Mr. Matthew Frain (postbac) and Ms. Cameau.
- 10 undergraduate students from France in their second year of engineering school for summer internship at FAU. Emmanuelle Réaux and Camille Jacquet (ENSCCF; 3 summer months in **2012**); Marine Gosselin (ENSCCF; 3 summer months in **2013**); Laurine Guillaume (ENSCMu; 4 summer months in **2014**); Benjamin Manga (ENSCP ChimieParisTech; 5 summer months in **2014**); Bastien Buissiere (ENSCP ChimieParisTech; 5 summer months in **2015**), Gwendoline Lebrun (ENSCCF; 3 summer months in **2015**) and Diana Bahneva (ENSCP ChimieParisTech; 5 summer months in **2016**). Mr. Baptiste Aumond and Ms. Oriane Desaunay (ENSCP ChimieParisTech; 5 summer months in **2017**)

Graduate Students: (6 Graduate students total; 2 students will graduate from the group 2017-2018)

1- Shyam Samanta (GS6) joined my group during the Fall 2011 and started to set-up the lab in Spring 2012, has been trained intensively for three months by myself and started to work on a natural product synthesis. (2 publications and 3 other manuscripts in preparation)

2- Nagalakshmi Jeedimalla (GS5) joined my group during the Fall 2012; she is currently working on a natural product synthesis and developing an unprecedented chemical method for epoxide rearrangement. (2 publications and 1-2 other manuscripts in preparation)

Graduate Students in rotation:

3- Tanya Kelley (GS1) joined my group during the fall 2013, has been trained intensively for 6 months by myself and she was working on establishing a novel catalytic transformation using photochemistry for the synthesis of sitagliptins and sildenafil analogues with Dr. Ken Dawson Skully as Co-PI.

4- Krishna Yadavalli (GS1) joined my group during the fall 2013 and worked in the group on establishing a novel catalytic transformation using photochemistry for the synthesis of sitagliptin analogues.

5- Miran Mavlan (GS1) joined my group during the fall 2014 and was working on the same project that Mr. Yadavalli. Miran Mavlan finished his rotation in my group in December 2014.

6- Yong Fan (GS1) started in my group during the Fall 2015.

SERVICE and PROFESSIONAL DEVELOPMENT

Website committee, Chair Dr. De Lill: 2012-2013

Graduate admissions committee, Chair Dr. Terentis, then Dr. Cudic: 2013-present

Instrumentation committee, Chair Dr. Mari, then Dr. Terentis 2015 – present

Strategic planning committee, College of Science 2017-2018

Thesis and Dissertation Committees:

At FAU

- Mr. Mohammed Alhuniti (Lepore Group, PhD) defended PhD thesis in 2015 (graduated)
- Mr. Yingzang He (West Group, PhD) defended PhD thesis in 2015 (graduated)
- Mr. Andrew Hall (West Group, PhD) defended PhD thesis in 2016 (graduated)
- Mr. Timothy Foo (Terentis Group, PhD) (in progress)
- Mr. Paul Scesa (West Group, PhD) (in progress)

At the SCRIPPS Florida

- Mr. John Whitaker (Roush Group; SCRIPPS) defended PhD thesis in 2012 (graduated)
- Mr. Maben Ying (Roush Group; SCRIPPS) defended PhD thesis in 2015 (graduated)
- Ms. Xiang "Alison" Gao (Snyder Group; SCRIPPS) PhD thesis defense in 2017 (graduated)

HOBBIES

Reading novels and foreign literature, playing saxophone (Jazz, Funk...), leisure basketball and gymnastic, yoga, tango and medium format film photography.