

Aaron M. Leconte

Associate Professor of Chemistry
Keck Science Department
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Professional Experience

Associate Professor of Chemistry 2018-present
Assistant Professor of Chemistry, Keck Science Department, 2012-2018
Claremont McKenna, Pitzer, and Scripps Colleges
Discovery and characterization of novel enzyme activities in (i) Taq DNA polymerase I and (ii) Firefly luciferase.

Visiting Researcher, University of California - Irvine 2016
Host: Jennifer A. Prescher
Application of statistical coupling analysis to engineering Firefly luciferase for multi-component imaging

NIH Postdoctoral Fellow, Department of Chemistry and Chemical Biology, Harvard University 2009-2012
Advisor: David R. Liu
(i) Identification and characterization of small molecule-RNA conjugates in biological systems using liquid chromatography/mass spectrometry. (ii) Development and application of continuous evolution as a model system of protein evolution.

Education

Ph.D., Chemical Biology, The Scripps Research Institute 2009
Advisor: Floyd E. Romesberg
(i) Expansion of the genetic alphabet through development of a third, orthogonal DNA base pair using synthetic chemistry, screening, enzymology, and directed evolution of DNA polymerases. (ii) Engineering of DNA polymerases for high throughput sequencing through directed evolution.

B.A., Chemistry, Carleton College 2004
Advisor: David G. Alberg
Design and synthesis of trypanothione analogues for inhibition of Trypanothione Reductase, a key enzyme for parasites of the genera Trypanosoma.

External Funding

Cottrell Scholar Collaborative Project (Research Corporation for Science Advancement), "Moving the Dial: A Network for Systemic Change", Co-Investigator, \$25,000 (2020-2022)

R15 Award (National Institutes of Health), "High-throughput engineering and characterization of brighter luciferases", Principal Investigator, \$362,752 (2019-2022)

CAREER Award (National Science Foundation), "Development of DNA polymerases capable of high fidelity modified DNA synthesis", Principal Investigator, \$400,000 (2018-2023)

Jean Dreyfus Lectureship for Undergraduate Institutions, “Applying molecular evolution to solve chemical problems – funding to bring Prof. David R. Liu to the Claremont Colleges”, co-lead Principal Investigator, \$18,500 (2017-2018)

Cottrell Scholar Award (Research Corporation for Science Advancement), “Biochemical characterization and engineering of luciferases through Statistical Coupling Analysis”, Principal Investigator, \$100,000 (2016-2019)

Ellen Browning Scripps Foundation, “Acquisition of a Fluorimeter for Undergraduate Instruction and Research”, co-Principal Investigator, \$20,000 (2016)

Cottrell College Science Award (Research Corporation for Science Advancement), “Biochemical characterization and engineering of Taq DNA polymerase mutants for the synthesis of 2’modified DNA”, Principal Investigator, \$50,200 (2014-2016)

TriLink ResearchRewards Grant (TriLink Biotechnologies), “Discovery and Characterization of New Mutant DNA Polymerase - Modified Substrate Interactions”, Principal Investigator, \$10,000 (2013-2015)

S.D. Bechtel, Jr. Foundation, “Funding for purchase of a biomolecular gel imager”, co-Principal Investigator, \$50,000 (2011).

Ruth L. Kirchstein National Research Service Award (National Institutes of Health). “Identification and Characterization of Small Molecule-RNA Conjugates in Yeast”, Principal Investigator, \$87,782 (2010-2012)

Awards

2018	National Science Foundation CAREER Award
2016	Cottrell Scholar Award
2014	Cottrell College Science Award
2010	NIH Ruth L. Kirchstein National Research Service Award
2008	ACS Division of Biological Chemistry Travel Award
2007	ARCS Foundation Fellowship
2006	Best Poster, Graduate Retreat, Chemistry (TSRI)
2006	Lesly Starr Shelton Award for Excellence in Chemistry Graduate Studies (TSRI)
2004	Franz Exner Award for Excellence in Chemistry (Carleton College)
2001	Dow Chemical Company Foundation Scholarship

Publications

At Keck Science Department

(underline indicates undergraduates from Claremont Colleges, * indicates equal author contribution)

1. A. S. Thompson, S. E. Barrett, A. G. Weiden, A. Venkatesh, M. K. C. Seto, S. Z. P. Gottlieb, and **A. M. Leconte** (2020). Accurate and efficient one-pot reverse transcription and amplification of 2’ fluoro-modified nucleic acids by commercial DNA polymerases, *Biochemistry*, **59**, 2833.
2. M. D. Liu*, E. A. Warner*, C. A. Morrissey, C. W. Fick, T. S. Wu, M. Y. Ornelas, G. V. Ochoa, B. Zhang, C. M. Rathbun, W. B. Porterfield, J. A. Prescher, and **A. M. Leconte**, (2018). Statistical Coupling Analysis-guided library design for discovery of mutant luciferases, *Biochemistry*, **57**, 663.
3. E. L. Lewis and **A. M. Leconte**, (2017). DNA polymerase activity assay using near-infrared fluorescent labeled DNA visualized by acrylamide gel electrophoresis, *Journal of Visualized*

Experiments, **128**, e56228.

4. S. L. Rosenblum, A. G. Weiden, E. L. Lewis, A. L. Ogonowsky, H. E. Chia, S. E. Barrett, M. D. Liu, and **A. M. Leconte**, (2017) Design and discovery of new combinations of mutant DNA polymerases and modified DNA substrates, *ChemBiochem*, **18**, 816.
5. H. J. Schultz, A. M. Gochi, H. E. Chia, A. L. Ogonowsky, S. Chiang, N. Filipovic, A. Weiden, E. E. Hadley, S. E. Gabriel, and **A. M. Leconte**, (2015) Taq DNA polymerase mutants and 2' modified sugar recognition, *Biochemistry*, **54**, 5999.

Before Keck Science Department

6. **A. M. Leconte**, B. C. Dickinson, D. D. Yang, I. A. Chen, B. Allen, and D. R. Liu, (2013) A population-based experimental model for protein evolution: effects of mutation rate and selection stringency on evolutionary outcomes, *Biochemistry*, **52**, 1490.
7. B. C. Dickinson, **A. M. Leconte**, K. M. Esvelt, B. Allen, and D. R. Liu, (2013) Experimental interrogation of the path dependence and stochasticity of protein evolution, *Proc. Natl. Acad. Sci.* **110**, 9007.
8. C. E. Dumelin, Y. Chen, **A. M. Leconte**, Y. G. Chen, and D. R. Liu, (2012) Discovery and biological characterization of geranylated RNA in bacteria, *Nature Chemical Biology*, **11**, 913.
9. M. H. Duyzend, C. T. Clark, S. L. Simmons, W. B. Johnson, A. M. Larson, **A. M. Leconte**, A. W. Willis, M. Ginder-Vogel, A. K. Wilhelm, J. A. Czechowicz, and D. G. Alberg, (2012) Synthesis and evaluation of substrate analogue inhibitors of trypanothione reductase, *J. Enzyme Inhib. Med. Chem.*, **6**, 784.
10. **A. M. Leconte**, M. P. Patel, L. E. Sass, P. McInerney, M. Jarosz, L. Kung, J. L. Bowers, P. R. Buzby, J. W. Efcavitch, and F. E. Romesberg, (2010) Directed evolution of DNA polymerases for next generation sequencing, *Angew. Chem. Int. Ed.*, **34**, 5921.
11. **A. M. Leconte** and F. E. Romesberg. *Invited book chapter*, (2009) Development of unnatural DNA base pair systems, in *Protein Engineering* (Springer).
12. Y. Hari, G. T. Hwang, **A. M. Leconte**, N. Joubert, M. Hocek and F. E. Romesberg, (2008), Optimization of the pyridyl nucleobase scaffold for polymerase recognition and unnatural base pair replication, *ChemBiochem*, **9**, 2796.
13. **A. M. Leconte**, G. T. Hwang, S. Matsuda, P. Capek, Y. Hari, and F. E. Romesberg, (2008) Discovery, characterization, and optimization of an unnatural base pair for expansion of the genetic alphabet, *J. Am. Chem. Soc.* **130**, 2336.
14. G. T. Hwang, **A. M. Leconte**, and F. E. Romesberg, (2007) Polymerase recognition and stability of fluoro-substituted pyridone nucleobase analogues. *ChemBiochem.*, **8**, 1606.
15. S. Matsuda, **A. M. Leconte**, and F. E. Romesberg, (2007) Minor groove hydrogen bonds and the replication of unnatural base pairs. *J. Am. Chem. Soc.*, **129**, 5551.
16. **A. M. Leconte** and F. E. Romesberg. *Invited commentary*, (2006) Chemical biology: a broader take on DNA. *Nature*, **444**, 553.
17. **A. M. Leconte** and F. E. Romesberg. *Invited commentary*, (2006) Amplify this! DNA and RNA get a third base pair. *Nature Methods*, **3**, 667.
18. **A. M. Leconte**, S. Matsuda, and F. E. Romesberg. (2006) An efficiently extended class of unnatural base pairs. *J. Am. Chem. Soc.*, **128**, 6780.
19. Y. Kim, **A. M. Leconte**, Y. Hari, and F. E. Romesberg. (2006) Stability and polymerase recognition of pyridine nucleobase analogs. *Angew. Chem. Int. Ed.*, **45**, 7809.
20. **A. M. Leconte**, S. Matsuda, G. Hwang, and F. E. Romesberg. (2006) Efforts toward expansion of the genetic alphabet: methyl pyridone and pyridone nucleobases. *Angew. Chem. Int. Ed.*, **45**, 4326.
21. **A. M. Leconte**, L. Chen, and F. E. Romesberg. (2005) Polymerase evolution: efforts toward expansion of the genetic code. *J. Am. Chem. Soc.*, **127**, 12470.

Scholarly presentations (independent career only):

1. Oral presentation (primary **research**): Santa Clara University (Santa Clara, CA), May 2020 (postponed due to pandemic).
2. Oral presentation (primary **research**): University of Minnesota (Minneapolis, MN), April 2020 (postponed due to pandemic).
3. Oral presentation (primary **research**): Greater Los Angeles (GALA) of Chemical Biology, June 2019. "Efforts towards accurate modified-DNA synthesis"
4. Oral presentation (primary **research**): Carleton College Chemistry Department (Northfield, MN). March 2019. "Using biochemistry and evolution to build better enzymes"
5. Oral presentation (primary **research**): Smith College Chemistry Department (Northampton, MA). March 2019. "Using biochemistry and evolution to build better enzymes"
6. Oral presentation (primary **research**): Soka University of America (Aliso Viejo, CA). February 2019. "Using biochemistry and evolution to build better enzymes"
7. Oral presentation (primary **research**): 256th National Meeting of the American Chemical Society (Boston, MA), August 2018. "Development of modified-DNA polymerases for accurate synthesis of nuclease-resistant modified DNA"
8. Oral presentation (primary **research**): Keck Science Department of Claremont McKenna, Pitzer, and Scripps Colleges (Claremont, CA). September 2017. "Using biochemistry and evolution to build better enzymes"
9. Oral presentation (**education**): 253rd National Meeting of the American Chemical Society (San Francisco, CA), April 2017. "Development of a bioinformatics driven research project as an introductory level course-based research experience".
10. Poster presentation (primary **research**): Cottrell Scholars meeting (Tuscon, AZ), July 2016. "Engineering luciferases using Statistical Coupling Analysis".
11. Oral presentation (**education**): Cottrell Scholars meeting, July 2016 (Tuscon, AZ). "Developing authentic early career research experiences for an introductory chemistry laboratory".
12. Oral presentation (primary **research**): 251st National Meeting of the American Chemical Society (San Diego, CA), March 2016. "Characterization and development of Taq DNA polymerase mutants capable of synthesizing 2' modified DNA".
13. Oral presentation (**outreach**): University of California – Irvine (Irvine, CA), August 2014. "Careers at Primarily Undergraduate Institutions".
14. Poster presentation (primary **research**): 248th National Meeting of the American Chemical Society (San Francisco, CA), August 2014. "Comparative biochemical characterization of laboratory-evolved Taq DNA polymerase mutants".
15. Poster presentation (primary **research**): American Society for Biochemistry and Molecular Biology Annual Meeting (San Diego, CA), April 2014. "Comparative characterization of Taq DNA polymerase mutants capable of recognizing 2' modified nucleotides".
16. Oral presentation (primary **research**): Harvey Mudd College (Claremont, CA); Dept of Biology, October 2013. "Experimental approaches to understanding laboratory evolution".

Teaching Experience

Keck Science Department, Department of Chemistry, Instructor
CHEM14L: Introduction to Chemistry Lab (lab only, Fall '12, '13, '19)
CHEM29L: Accelerated General Chemistry (lecture only, Fall '14)
CHEM40L: Introduction to Biological Chemistry (Fall '15, '16, '17)
CHEM125L: Advanced Laboratory in Biochemistry (Spring '20, '21)
CHEM127L: Advanced Laboratory in Chemistry II (Spring '13, '14, '15, '17)
CHEM177/BIO177: Biochemistry (Fall '12, '13, '14, '19, '20 Spring '15, '18)
CHEM180: Applied Biomolecular Evolution (Spring '14, '18, '20)
CHEM199: Independent Study (Spring '14, '15, '16, '18, '20, '21, Fall '20)

Keck Science Department, Department of Chemistry, Guest Lecturer
BIO144: Drugs and Molecular Medicine (1 lecture, Fall '13)
BIO171: Biology of Cancer (4 lectures, Spring '15)
BIO180: Molecular Biology (1 lecture, Spring '16)

Professional Development

- AALAC workshop on integrated laboratories (Philadelphia, PA, August 2012, 2 days).
- Teaching/Learning Workshop (Claremont, CA, January 2013, 1 day).
- Designing Scientific Teaching Tools for BMB Education (UC-Santa Barbara, February 2014, 1 day).
- Addressing Difficult Dialogues: How Faculty Can Create a More Inclusive Campus (Claremont, CA, September 2014, ½ day).
- Cottrell Scholars Conference 2016: Building Bridges (Tucson, AZ, July 2016, 3 days).
- Designing rubrics that benefit both instructors and students. (Claremont, CA, March 2017, 1.25hrs).
- Cottrell Scholars Conference 2017: More Viewpoints, Better Science (Tucson, AZ, July 2017, 3 days).
- Molecular Sciences Software Institute - Teach the Teachers Workshop: Python Scripting for Computational Molecular Science (Arlington, VA, August 2019, 2 days)
- What Your Students Want You to Know About ... the Chicanx / Latinx Student Experience (Claremont, CA, 1 hour)
- Enhancing Science Courses by Integrating Python (online, June 2020, 2 days)
- Cottrell Scholars Conference 2020: Online Education (online, July 2020, 2 days)

Undergraduate research students mentored (listed chronologically by start date)

(*students who have co-authored publications; ¹joint student with Prof. Andre Cavalcanti, Pomona College; ²joint student with Prof. Matthew Sazinsky, Pomona College)

- **Mikayla Carrier** (SCR '21) 2020-present
- **Trevor Christensen** (CMC '22) 2020-present
- **Anjali Mamidwar** (SCR '21) 2020-present
- **Tiffany Pham** (SCR '23) 2020-present
- **Abrahan Vasquez** (CMC '23) 2020-present
- **Amy Xue** (CMC '22) 2020-present
- **Natalie Belz** (SCR '21) 2019-present
- **Lyndsey Flanagan** (CMC '20) 2019-2020 / *currently*: pursuing medical anthropology.
- **Synaida Maiche** (CMC '22) 2019-present
- **Emma Garval** (SCR '21) 2018-2019. Scripps student pursuing public health.
- **Jordan Gewing-Mullins** (SCR '21) 2018-present
- ***Simone Gottlieb** (SCR '21) 2018-present
- **Whitney Lieberman** (CMC '20) 2018-2020 / *currently*: Research Assistant (National Institutes of Health).
- **Edison Reid-McLaughlin** (SCR '21) 2018-present
- ***Madison Seto** (SCR '21) 2018-present
- ***Arianna Thompson** (SCR '21) 2018-present
- ***Ananya Venkatesh** (SCR '21) 2018-present
- **Lauren Clubb** (CMC '18) 2017-2018 / *post-graduation*: Research Assistant (National Institutes of Health); *currently*: Ph.D. student (University of California – San Diego, Immunology).
- **Kinsey Lee** (SCR '20) 2017-2019 / *currently*: Scripps student.
- **Kristi Lee** (SCR '20) 2017-2020 / *currently*: Research Assistant (National Institutes of Health).
- ***Marya Ornelas** (PIT '20) 2017-2020 / *currently*: Ph.D. student (University of Illinois-Urbana Champaign, Chemical Biology).
- ***Susanna Barrett** (SCR '19) 2016-2019 / *currently*: Ph.D. student (University of Illinois-Urbana Champaign, Chemical Biology).

- **Michelle Cao** (CMC '19) 2016-2016 / *currently*: Deloitte Consulting.
- **Owen Chapman**¹ (POM '17) 2016-2017 / *currently*: Ph.D. student (University of California – San Diego, Systems Biology).
- ***Caitlyn Fick** (SCR '19) 2016-2017 / *post-graduation*: Research Assistant (Los Alamos); *currently*: Ph.D. student (University of California – Los Angeles).
- **Ellery Koelker-Wolfe**² (CMC '19) 2016-2019 / *currently*: Research Assistant (City of Hope).
- ***Eliza Lewis** (SCR '17) 2016-2017 / *post-graduation*: Research Assistant in Baron Lab (Mt. Sinai); *currently*: Marketing Analyst at Kepler Group.
- ***Charlotte Morrissey** (CMC '19) 2016-2018 / *currently*: pursuing culinary careers.
- **Catherine Chiang**² (SCR '16) 2015-2015 / *currently*: data analyst, Downtown Emergency Service Center, Seattle WA.
- ***Mira Liu** (CMC '18) 2015-2018 / *currently*: Ph.D. student (University of California-Berkeley, Chemistry)
- ***Sydney Rosenblum** (SCR '17) 2015-2017 / *currently*: Ph.D. student (University of Michigan, Chemical Biology).
- ***Elliot Warner** (CMC '18) 2015-2018 / *currently*: Ph.D. student (The Scripps Research Institute – La Jolla, Chemical Biology)
- ***Taia Sean Wu** (SCR '15) 2015-2015 / *post-graduation*: Research Assistant in Bertozzi Lab (Stanford); *currently*: Ph.D. student (University of California - San Francisco, Chemical Biology).
- ***Sharon Chiang** (CMC '17) 2014-2014 / *post-graduation*: Consultant at Triage Consulting Group; *currently*: Product Operations at Facebook.
- ***Nedim Filipovic** (CMC '17) 2014-2014 / *currently*: Web developer at Clearly.
- ***Aurora Weiden** (SCR '17) 2014-2017 / *currently*: Research Assistant in Brumback Lab (UT-Austin).
- **Constanza Jackson** (SCR '15) 2013-2014 / *currently*: Research Assistant in Guttman Lab (Caltech).
- **Jacqueline Kroll**² (CMC '15) 2013-2015 / *post-graduation*: veterinary technician; *currently*: D.V.M. student (University of California – Davis).
- ***Hannah Chia** (SCR '16) 2013-2015 / *currently*: Ph.D. student (University of Michigan, Chemical Biology).
- ***Emma Hadley** (SCR '14) 2013-2014 / *post-graduation*: Research Assistant in Lee Lab (University of Southern California); *currently*: M.D. student (Tufts University).
- ***Alexie Ogonowsky** (SCR '16) 2013-2015 / *post-graduation*: Marketing Associate at Protein Simple, M.B.A. (Notre Dame University); *currently*: product manager at Illumina.
- ***Sara Gabriel** (CMC '15) 2012-2013 / *currently*: Consultant at Cambridge Associates.
- ***Andrea Gochi** (PIT '14) 2012-2014 / *post-graduation*: Lab Manager at Vaccine Research Center (Pitzer College); *currently*: M.D. student (University of California – Riverside).
- ***Hayley Schultz** (CMC '15) 2012-2015 / *post-graduation*: Research Assistant at Breast Care Center Project (UCSF), M.D. (University of California – San Francisco); *currently*: OB/GYN resident.
- **Alfredo Valencia**² (PIT '14) 2012-2014 / *post-graduation*: Ph.D. (Harvard University, Chemical Biology); *currently*: Stanford Science Fellow in Pasca Group (Stanford).
- ***David Yang** (Harvard '13) 2010-2012 / *currently*: M.D. student at Harvard Medical School
- ***Meha Patel** (TSRI, pre-graduate) 2007-2008 / *currently*: Ph.D. student at Baylor College of Medicine.

Service and Outreach

At Claremont Colleges

Tenure-track faculty search for an Organic Chemist (2021-present)
 Facilities Committee (Claremont McKenna College, 2019-present)
 Teaching and Learning Committee (Pitzer College, 2019-present)
 Faculty Executive Committee – (Keck Science Department, 2016-2018)

Chemistry Seminar Coordinator – (Keck Science Department, 2013-2018)
Co-chair of tenure-track faculty search for a Bioanalytical Chemist (Keck Science Department, 2016)
Invited Panelist, New Faculty Retreat (Keck Science Department, 2016)
Summer Science Immersion Program (Keck Science Department, 2015-2016)
Organizing committee for Nelson Lecture Series (Harvey Mudd College, Fall 2014)
Faculty mentor for Visiting Professor Arlie Rinaldi (Keck Science Department, 2014-2016)
Institutional Review Board (Claremont McKenna College, 2013-2015)
Student Recruiting Committee (Claremont McKenna College, 2013-2014)
SCA MASS (Scripps College, 2013)

External service

Reviewer for scientific manuscripts: Nucleic Acids Research, Journal of the American Chemical Society, Israel Journal of Chemistry, Frontiers in Molecular Biosciences, Luminescence, ACS Chemical Biology, Nature Chemistry, Chemical Reviews, Applied Microbiology and Biotechnology, ACS Omega, ACS Books

Reviewer for funding proposals: National Science Foundation, Swiss National Science Foundation