

Cornelius Y. Taabazuig, Ph.D.

NIH Pathway to Independence (K99/R00) Postdoctoral Fellow
Memorial Sloan-Kettering Cancer Center
417 East 68th Street, New York, NY 10065
Email: taabazuc@mskcc.org

EDUCATION

2005 – 2009 B.S., Biochemistry and Molecular Biology, University of Massachusetts Amherst, MA
2009 – 2015 Ph.D., Biological Chemistry, University of Massachusetts Amherst, MA

POSITIONS AND EMPLOYMENT

2007 - 2009 Undergraduate Research Assistant, UMass Amherst, Advisor: Nathan A. Schnarr
2009 - 2009 HHMI EXROP Intern, University of Colorado Boulder, Advisor: Thomas R. Cech
2009 - 2015 Chemistry Graduate Research Assistant, UMass Amherst, Advisor: Michael J. Knapp
2016 - Present Research Fellow, Memorial Sloan-Kettering Cancer Center, Advisor: Daniel A. Bachovchin

HONORS AND AWARDS

2007 Bates and Bradspies Research Fellowship Award, UMass Amherst
2008 - 2009 Junior Fellows in the Life Sciences Award, UMass Amherst
2008 Commonwealth College Honors Research Grant, UMass Amherst
2009 Commonwealth College Departmental Honors Scholar (*Magna cum Laude*)
2009, 2013 NSF Northeast Alliance for Graduate Education and the Professoriate Fellowship
2013 - 2014 NIH Chemistry Biology Interface Training Fellowship
2013 William E. McEwen Fellowship Award for Outstanding Poster Presentation, UMass Amherst
2014 SACNAS Outstanding Graduate Student Oral Presentation in Biochemistry
2014 Dr. Paul Hathaway Terry Graduate Scholarship for Outstanding Research Presentation, UMass
2014 Keystone Symposia Travel Grant Scholarship
2018 - 2020 American Cancer Society Postdoctoral Fellowship
2018 - Present Michael John Kennedy Society Scholar, Memorial Sloan-Kettering Cancer Center
2018 American Cancer Society Award for Best Oral Presentation, New England Science Symposium
2018 MSKCC Annual Postdoctoral Symposium Outstanding Poster Presentation Award
2018 2nd Place Postdoc Slam Winner, Memorial Sloan-Kettering Cancer Center
2019 Vertex Postdoctoral Award for Poster Presentation, New England Science Symposium
2020 - Present NIH (NIAID) Pathway to Independence Award (K99/R00)
2020 - Present Ernest E. Just Postgraduate Fellowship in the Life Sciences

PEER-REVIEWED PUBLICATIONS (* Equal Contribution)

16. A. J. Chui, A. R. Griswold, **C. Y. Taabazuig**, E. L. Orth, K. Gai, S. D. Rao, D. P. Ball, & D. A. Bachovchin. "Activation of the CARD8 inflammasome requires a disordered region" (2020) **Cell Reports** 33(2): 108264
15. **C. Y. Taabazuig**, A. R. Griswold, D.A Bachovchin, "The NLRP1 and CARD8 inflammasomes" (2020) **Immunological Reviews** 297: 1 – 13 (Invited Review)
14. D. P. Ball,* **C. Y. Taabazuig**,* A. R. Griswold, E. L. Orth, S. D. Rao, I. B. Kotliar, L. E. Vostal D. C. Johnson, D.A Bachovchin, "Caspase-1 interdomain linker cleavage is required for pyroptosis" (2020) **Life Science Alliance** 3(3): e202000664
13. A. R. Griswold, D. P. Ball, A. Bahattacherjee, A. J. Chui, S. D. Rao, **C. Y. Taabazuig**, D. A. Bachovchin. "DPP9's enzymatic activity and not its binding to CARD8 inhibits inflammasome activation" (2019) **ACS Chemical Biology** 14: 2424–2429
12. A. J. Chui,* M. C. Okondo,* S. D. Rao,* K. Gai, A. R. Griswold, D. C. Johnson, D. P. Ball, **C. Y. Taabazuig**, E. L. Orth, B. A. Vittimberga, D. A. Bachovchin. "N-terminal degradation activates the NLRP1B inflammasome" (2019) **Science** 364(6435): 82 – 85

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11. D. C. Johnson,* **C. Y. Taabazuig**,* M. C. Okondo, A. J. Chui, S. D. Rao, F.C. Brown, C. Reed, E. Peguero, E. de Stanchina, A. Kentsis, D.A Bachovchin, "DPP8/9 inhibitor-induced pyroptosis for treatment of acute myeloid leukemia" (2018) **Nature Medicine** 24(8): 1151 – 1156
10. M. C. Okondo,* S. D. Rao,* **C. Y. Taabazuig**,* A. J. Chui, S. E. Poplawski, D. C. Johnson, D. A. Bachovchin. "Inhibition of DPP8/9 activates the Nlrp1b inflammasome" (2018) **Cell Chemical Biology** 25: 262-267
9. **C. Y. Taabazuig**, M. C. Okondo, and D. A. Bachovchin. "Pyroptosis and apoptosis pathways engage in bidirectional crosstalk in monocytes and macrophages" (2017) **Cell Chemical Biology** 24: 507-514.
8. J. A. Hangasky, **C. Y. Taabazuig**, C.B. Martin, S. Eron, S. C. Garman, and M. J. Knapp. "The facial triad in the α KG oxygenase Factor Inhibiting HIF (FIH): a role for sterics in linking substrate binding to O₂ activation." (2017) **Journal of Inorganic Biochemistry** 166: 26-33.
7. **C. Y. Taabazuig**, J. T. Fermann, S. C. Garman, M. J. Knapp. "Substrate promotes productive gas binding in the α KG-dependent oxygenase FIH" (2016) **Biochemistry** 55(2): 277-286
6. S. Pektas, **C. Y. Taabazuig**, M. J. Knapp. "Increased turnover under limiting [O₂] by the Thr387 → Ala mutant of the HIF-prolyl hydroxylase PHD2" (2015) **Biochemistry** 54(18): 2851-2857
5. **C. Y. Taabazuig**, J. A. Hangasky, M. J. Knapp. "Oxygen sensing strategies in mammals and bacteria" (2014) **Journal of Inorganic Biochemistry** 133: 63-72 (Special Issue: "Gas and Redox Sensors") *cover artwork*
4. J. A. Hangasky, **C. Y. Taabazuig**, M. A. Valliere, and M. J. Knapp. "Imposing function down a (cupin)-barrel: secondary structure and metal stereochemistry in the α KG-dependent oxygenases." (2013) **Metalomics** 5(4):287-301 (Themed Issue: "Microbial Metallomics")
3. J. S. Pflingsten, K. J. Goodrich, **C. Y. Taabazuig**, F. Ouenzar, P. Chartrand and T.R. Cech. "Mutually exclusive binding of telomerase RNA and DNA by Ku alters telomerase recruitment model." (2012) **Cell** 148(5):922-932.
2. Flagg, S. C., C. B. Martin, **C. Y. Taabazuig**, B. E. Holmes and M. J. Knapp. "Screening chelating inhibitors of HIF-prolyl hydroxylase domain 2 (PHD2) and factor inhibiting HIF (FIH)." (2012) **Journal of Inorganic Biochemistry** 113(0): 25-30.
1. E. Saban, Y.-H. Chen, J. A. Hangasky, **C. Y. Taabazuig**, B. E. Holmes and M. J. Knapp. "The second coordination sphere of FIH controls hydroxylation." (2011) **Biochemistry** 50(21): 4733-4740.

INVITED AND CONFERENCE PRESENTATIONS (SELECTED OUT OF 14)

- 2019 Howard Hughes Medical Institute Exceptional Research Opportunities Program (EXROP) Annual Meeting, Chevy Chase, MD "The role of ICE in fiery cell death" (**Invited Keynote Speaker**)
- 2018 New York Academy of Science Year End Symposium, New York, NY "A tale of two deaths: What determines how immune cells die?"
- 2018 Harvard Medical School New England Science Symposium, Boston, MA "Inhibition of DPP8/9 activates the Nlrp1b inflammasome" (**Awarded Prize for Best Oral Presentation**)
- 2017 10th General Meeting of the International Proteolysis Society, Banff Conference Center, Canada "Pyroptosis and apoptosis pathways engage in bidirectional crosstalk in monocytes and macrophages"
- 2015 Kwame Nkrumah University of Science and Technology Chemistry Department Seminar, Kumasi, Ghana "Learning through research" (**Invited Speaker**)

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- 2014 SACNAS National Conference, Los Angeles, CA “*Small molecule effectors of the hypoxia sensing enzyme FIH*” (**Awarded Prize for Best Oral Presentation**)
- 2014 North Carolina State’s Building Future Faculty Program Chemistry Department Seminar, Raleigh, NC “*Small molecule effectors of the hypoxia sensing enzyme FIH*”
- 2013 American Chemical Society Northeast Regional Meeting, New Haven, CT “*Spectroscopic studies on the human hypoxia sensing enzyme FIH*”

POSTER PRESENTATIONS (SELECTED OUT OF 12)

- 2019 Memorial Sloan-Kettering Postdoctoral Research Symposium NY, NY “*Human caspase-1 autoproteolysis is required for ASC-dependent and -independent inflammasome activation*”
- 2019 Harvard Medical School New England Science Symposium, Boston, MA “*CARD8 mediates DPP8/9 inhibitor-induced pyroptosis in human myeloid cells*” (**Awarded Prize for Best Postdoctoral Poster Presentation**)
- 2018 Memorial Sloan-Kettering Postdoctoral Research Symposium NY, NY “*CARD8 mediates DPP8/9 inhibitor-induced pyroptosis in human myeloid cells*” (**Awarded Prize for Best Poster Presentation**)
- 2018 Gordon Research Conference on Cell Death, Newry, ME “*CARD8 mediates DPP8/9 inhibitor-induced pyroptosis in human myeloid cells*”
- 2018 New York Academy of Science Year End Symposium, New York, NY “*Pyroptosis and apoptosis pathways engage in bidirectional crosstalk in monocytes and macrophages*”
- 2017 10th General Meeting of the International Proteolysis Society, Banff Conference Center, Canada “*Pyroptosis and apoptosis pathways engage in bidirectional crosstalk in monocytes and macrophages*”
- 2014 Keystone symposia on Sensing and Signaling of Hypoxia: Interfaces with Biology and Medicine, Breckenridge, CO “*Spectroscopic and kinetic characterization of the effects of NO and H₂S on the human hypoxia sensing enzyme FIH*”
- 2013 University of Massachusetts Amherst Research Festival, Amherst, MA “*The gas binding pocket of FIH*” (**Awarded Prize for Best Poster Presentation**)
- 2010 HHMI EXROP Conference, Chevy Chase, MD “*Investigating the contributions of yKu DNA binding capability in telomere length regulation*”

TEACHING AND MENTORING EXPERIENCE

- 2018 - present Helped design and teach a course on cancer biology to 6th and 7th graders at The Dock Street School in Brooklyn NY
- 2015 Center for Integration of Research, Teaching and Learning (CIRTL) Associate Certification (UMass Amherst)
- 2015 (Spring) Chem 269 – Undergraduate Organic Chemistry Lab Instructor
- 2015 (Spring) Chem 650 (Graduate Course, 1 Lecture) – Metals in Biology
- 2013 (Fall) Chem 792C S (Graduate Course) – Chemistry Biology Interface Journal Club Instructor
- 2010 - 2015 Trained/mentored 2 undergraduate students in the lab of Michael J. Knapp through the completions of their honors thesis work. I also trained younger graduate students in lab and students using the Electron Paramagnetic Resonance (EPR) spectroscopy facility.
- 2013 - 2015 Each One Reach One Mentoring Program – Guided undergraduate underrepresented students through the process of finding and applying to graduate school.
- 2012 - 2015 Northeast Alliance for Graduate Education and the Professoriate (NEAGEP) Mentoring Program – Mentored underrepresented students in the PREP program or 1st year of graduate school.
- 2009 - 2013 Residential Education – Served as an Assistant Residence Director (ARD) who provided ongoing training and mentoring to 19 Residential Education staff members and oversaw a building of 550+ students from 2009 – 2012. In 2013, I advised the Northeast Residential area at UMass Amherst in the student code of conduct.

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PROFESSIONAL MEMBERSHIPS

2017 - present International Proteolysis Society
2017 - present New York Academy of Science
2009 - 2017 American Chemical Society

RESEARCH SUPPORT GRANTS

ONGOING SUPPORT

NIH (NIAID): 1 K99 AI148598-01

08/17/2020 – 07/31/2022

Project: Investigating the function of ZU5 domain-containing proteins as amplifiers of caspase activation

Goal: The goal of this project is to uncover the molecular mechanisms of activation of NLRP1/CARD8 and PIDD, which activate caspase-1 and caspase-2 respectively.

Role: PI

Ernest E. Just Postgraduate Fellowship in the Life Sciences

09/01/2020 – 07/31/2022

Granting Institutions: Bristol-Myers Squibb and United Negro College Foundation (UNCF)

Project: Discovery and characterization of caspase-1 substrates using innovative protease profiling platforms

Goal: The goal of this project is to identify and characterize new caspase-1 substrates.

Role: PI

COMPLETED

131098-PF-17-224-01-CCG: American Cancer Society Postdoctoral Fellowship 01/01/2018 – 08/19/2020

Project: Defining the Regulation and Activity of Pro-Caspase-1 in Cell Death

Goal: The goal of this project was to define the regulatory proteins that control pro-caspase-1 activation.

Role: PI

REFERENCES

Michael J. Knapp, PhD
Associate Professor, Department
of Chemistry
University of Massachusetts
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Guy Salvesen, PhD
Professor, Cancer, Molecules, and
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