

Usha Farey Lingappa (she/her)

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EDUCATION

2015 – 2021	California Institute of Technology PhD, Geobiology
2008 – 2012	Hampshire College BA, self-designed major in Astrobiology

RESEARCH POSITIONS

2021 – present	University of California Berkeley Postdoctoral Scholar, Institute for Quantitative Biosciences Visiting Scientist, Lawrence Livermore National Laboratory
2015 – 2021	California Institute of Technology Graduate Research Fellow, Division of Geological and Planetary Sciences
2012 – 2015	NASA Ames Research Center/SETI Institute Ames Associate, Division of Space Sciences and Astrobiology
2009 – 2015	Prosetta Biosciences Program Manager, Rabies Drug Discovery (2014-2015) Assistant Research Scientist, Biochemistry Team (2012-2015) Intern, Biochemistry Team (summer 2009, summer 2010)
2009 – 2011	Hampshire College Undergraduate Researcher, School of Natural Sciences
2010	Cerro Tololo Inter-American Observatory Research Assistant

SCIENTIFIC PRESENTATIONS

Conference abstract titles and authors listed at end of CV

Talks

2024	Yosemite Symbiosis Workshop, UCNRS Yosemite Field Station, Wawona, CA
2023	International Chlamydomonas Conference, Princeton, NJ
2022	Invited seminar, Arcadia Science, online
2022	Gordon Research Conference on Geobiology, Ventura, CA
2022	Bioenergetics Seminar Series, UC Berkeley/LBNL, online
2022	Invited seminar, Microsoft Research Health Futures Group, online
2020	Geobiology Supergroup seminar, CU Boulder, online
2019	Yuk Lunch Seminar Series, Caltech Planetary Sciences, Pasadena, CA
2018	MicroMorning Seminar Series, Caltech CEMI, Pasadena, CA
2018	Berkeley Symposium on Photosynthesis, Carbon, and the Environment, Berkeley, CA
2017	Gordon Research Conference on Photosynthesis, Sunday River, ME
2017	Western Photosynthesis Conference, Marshall, CA
2013	Bay Area Symposium on Viruses, Berkeley, CA

Posters

2024	Gordon Research Conference on Geobiology, Galveston, TX
2019	American Geophysical Union Fall Meeting, San Francisco, CA
2019	Workshop on Cyanobacteria, Boulder, CO
2018	International Society on Photosynthesis Research Conference, Vancouver, BC

2017	Southern California Geobiology Symposium, Los Angeles, CA
2016	American Geophysical Union Fall Meeting, San Francisco, CA
2013	International Conference on Antiviral Research, San Francisco, CA
2012	American Society for Cell Biology Meeting, San Francisco, CA
2010	International Conference on Antiviral Research, San Francisco, CA

SCIENCE ILLUSTRATION

Art exhibitions

	Contributor to <i>Incendiary Traces</i> by Hillary Mushkin
2020	Prepared for COLA exhibition, LA Municipal Art Gallery, Los Angeles, CA
2022	Included in <i>Plein Air</i> , MoCA Tucson, Tucson, AZ
2017	Contributor to <i>Art of Science</i> , Armory Center for the Arts, Pasadena, CA
2016	<i>Blueshift</i> , PRACTICE Gallery, Philadelphia, PA (collaboration with Ian Etter)
2012	<i>That's Life</i> , Centrum Gallery, Amherst, MA (collaboration with Casey Andrews)

Artist positions

2018 – 2021	Caltech Letters (online publication, www.caltechletters.org) Graphics Director (2019 – 2021) Staff Artist (2018 – 2021)
2012 – 2016	Science Illustrator, Interdisciplinary Institute for Sciences

OTHER SCI COMM

Television appearances

2023	PBS NOVA, season 50, episode 11 <i>Ancient Earth: Birth of the Sky</i> https://www.pbs.org/video/ancient-earth-birth-of-the-sky-vgs18a/
2023	BBC Earth, series 1, episode 4 <i>Atmosphere</i>

Public lectures

2023	Lamorinda Sunrise Rotary Club, Lafayette, CA <i>The Origin of Oxygenic Photosynthesis</i>
2022	Science Journeys, Caltech Public Programming <i>The Art and Science of Photosynthesis</i> https://www.youtube.com/watch?v=V1YM2HwUpqQ

Youth outreach

2010 – present	Watertown High School, Gann Academy, TechBoston Academy, El Cerrito High School, Gateway High School, Hamilton Elementary School, Muir High School, Blair High School, Techbridge, ACE Middle School, Los Altos High School, NASA ARC Women's Influence Network, Girl Scouts of Northern California, Nava Elementary School, NexGeneGirls, SETI Institute
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TEACHING & MENTORSHIP

2021 – present	Research Mentor, UC Berkeley <ul style="list-style-type: none"> • Summer 2023 – Summer 2024: Jude Edwards, full-time research technician • Fall 2021 – Spring 2024: Jordan Chastain, UC Berkeley undergrad • Fall 2022 – Fall 2023: Eve Sindermann, full-time research technician • Summer 2022: Delia Rodríguez González De Lara, U of Granada undergrad
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2017 – 2019	Research Mentor, Caltech <ul style="list-style-type: none"> • Summer 2019: Joshua Phelan, CSU Fullerton undergraduate • Summer 2018: Jenny Ji, Troy Tech high school student • Summer 2017: Kabir Mohammed, Caltech undergraduate
2016 – 2020	Teaching Assistant, Caltech <ul style="list-style-type: none"> • Ge197: Special topics in Geobiology: Photosynthesis • Ge11b/Ge104: Earth and the Biosphere/Introduction to Geobiology (3x)
2010 – 2012	Teaching Assistant, Hampshire College <ul style="list-style-type: none"> • NS-212: Organic Chemistry I • NS-257: Astrobiology • NS-227: Life on Mars • NS-101: Gene Cloning (molecular biology bootcamp) • NS-204: Physics I

ACADEMIC SERVICE

Journal Reviewer

Algal Research, Proceedings of the National Academy of Sciences, Frontiers in Microbiology, Astrobiology, Earth and Planetary Science Letters

External Reviewer

NASA Planetary Science Division FINESST-22

2016, 2019	Organizer and Session Chair, Southern California Geobiology Symposium, Caltech
2017 – 2018	Organizer, Geoclub Seminar Series, Caltech
2009 – 2010, 2011 – 2012	Voting Student Rep, School of Natural Science faculty meetings, Hampshire College
2008 – 2010	Community Council Subcommittee for Public Health and Safety, Hampshire College

FIELDWORK

2024	Point Bonita and Point Reyes, CA, USA ◆▲	Key ▲ microbes ■ rocks ● sediments ◆ soil
2024	Southeast Farallon Island, CA, USA ◆▲	
2023	Hampshire College Farm, MA, USA ◆▲	
2023	Paradise Valley Farm, CA, USA ◆▲	
2022	Gill Tract Farm, CA, USA ◆▲	
2021, 2022	UC Berkeley Botanical Garden, CA, USA ◆▲	
2021	Big Pine Key and Marquesas Keys, FL, USA ●▲	
2019	Great Salt Lake, UT, USA ●▲	
2019	Et-then Group and Pethei Group, NWT, Canada ■	
2017	Transvaal Supergroup, NC, South Africa ■▲	
2017	Black Point Lava Flow, AZ, USA ■▲	
2017	Chapin Wash Formation and Pinal Creek, AZ, USA ■	
2016, 17, 18, 19	Little Ambergris Cay, Turks and Caicos Islands ●▲	
2016	Van Horn Formation, TX, USA ■	
2016	Little Hot Creek, CA, USA ▲	
2011, 2013	Mars Desert Research Station, UT, USA ■▲	
2010	San Pedro de Atacama, Chile ■▲	
2009, 16, 17, 18	Death Valley, CA, USA ■▲	

AWARDS

2018	Society of Exploration Geophysicists JaWS Entrepreneurial Pitch Contest (1 st place)
2017	Oral Presentation Award (1 st place), Gordon Research Conference on Photosynthesis
2017	Metzner Prize (2 nd place), Caltech Art of Science Competition
2017	Beverly Green Award (1 st place oral presentation), Western Photosynthesis Conference
2016 – 2019	NSF Graduate Research Fellowship
2015 – 2016	Caltech CEMI Fellowship
2015 – 2016	Caltech Caryl Otte Fellowship in Geology
2013	Poster Presentation Award (2 nd place), Intl. Conference on Antiviral Research
2012	Earl Ubell Science Communication Award

PATENTS

E J Trower, **U F Lingappa**, J P Grotzinger, W W Fischer. “Microabrasive compositions containing ooids.” US Patent US10407601 (2018).

PUBLICATIONS

*equal contribution

S Dupuis, **U F Lingappa**, X Mayali, E S Sindermann, J L Chastain, P K Weber, R Stuart, S S Merchant. “Scarcity of fixed carbon transfer in a model microbial phototroph-heterotroph symbiosis.” *ISME J* 18: wrae140 (2024).

M Michon*, A Müller-Schiffmann*, and 55 others including **U F Lingappa**. “A pan-respiratory antiviral chemotype targeting a transient host multi-protein complex.” *Open Biology* 14: 230363 (2024).

R Murali, L A Pace, R A Sanford, L M Ward, M M Lynes, R Hatzenpichler, **U F Lingappa**, W W Fischer, R B Gennis, J Hemp. “Diversity and evolution of nitric oxide reduction in Bacteria and Archaea.” *Proceedings of the National Academy of Sciences* 121:e2316422121 (2024).

N T Stein, J P Grotzinger, D P Quinn, **U F Lingappa**, T M Present, E J Trower, M L Gomes, E Orzechowski, M Cantine, K S Metcalfe, W W Fischer, B L Ehlmann, A H Knoll. “Geomorphic and environmental controls on microbial mat fabrics on Little Ambergris Cay, Turks and Caicos Islands.” *Sedimentology* 70:1915-1944 (2023).

U F Lingappa, N T Stein, K S Metcalfe, T M Present, V J Orphan, A H Knoll, J P Grotzinger, E J Trower*, M L Gomes*, W W Fischer*. “Early impacts of climate change on a coastal marine microbial mat ecosystem.” *Science Advances* 8:eabm7826 (2022).

• Featured in *The Science Breaker*, August 2023.

[<https://thesciencebreaker.org/breaks/earth-space/of-microbes-and-megastorms/>]

• Featured in *The Times of the Islands*, September 2023.

[<https://www.timespub.tc/2023/09/microbial-mats/>]

B Kim*, **U F Lingappa***, J S Magyar, D R Monteverde, J S Valentine, W W Fischer, J Cho. “Challenges of measuring soluble Mn(III) in natural samples.” *Molecules* 27:1661 (2022).

H Yu, G L Chadwick, **U F Lingappa**, J R Leadbetter. “Comparative studies on cultivated and uncultivated, freshwater and marine “*Ca. Manganitrophaceae*” genomes implicates their worldwide reach in manganese chemolithoautotrophy.” *mBio* e0342121 (2022).

U F Lingappa, C M Yeager, A Sharma, N L Lanza, D P Morales, G Xie, A D Atencio, G L Chadwick, D R Monteverde, J S Magyar, S M Webb, J S Valentine, B M Hoffman, W W Fischer. “An ecophysiological explanation for manganese enrichment in rock varnish.” *Proceedings of the National Academy of Sciences* 118(25):e2025188118 (2021).

M M Douglas, **U F Lingappa**, M P Lamb, J C Rowland, A J West, G Li, P C Kemeny, A J Chadwick, A Piliouras, J Schwenk, W W Fischer. “Impact of river channel lateral migration on microbial communities across a discontinuous permafrost floodplain.” *Applied and Environmental Microbiology* 01339-21 (2021).

T M Present, M L Gomes, E J Trower, N T Stein, **U F Lingappa**, J Naviaux, M T Thorpe, M D Cantine, W W Fischer, A H Knoll, J P Grotzinger. “Non-lithifying microbial ecosystem dissolves peritidal lime sand.” *Nature Communications* 12:3037 (2021).

Y Liu, W W Fischer, C Ma, Y Guan, J R Beckett, O Tschauer, Y Guan, **U F Lingappa**, S M Webb, V B Prakapenka, N L Lanza, C B Agee. “Manganese oxides in Martian meteorites Northwest Africa (NWA) 7034 and 7533.” *Icarus* 364:114471 (2021).

L M Ward, **U F Lingappa**, J Grotzinger, W Fischer. “Microbial mats in the Turks and Caicos Islands reveal diversity and evolution of phototrophy in the Chloroflexota order Aggregatilineales.” *Environmental Microbiome* 15:9 (2020).

B P Smith, M Ingalls, E J Trower, **U F Lingappa**, T M Present, J S Magyar, W W Fischer. “Physical Controls on Carbonate Intracasts: Modern Flat Pebbles from Great Salt Lake, Utah.” *Journal of Geophysical Research: Earth Surface* 125:e2020JF005733 (2020).

M Gomes, L A Reidman, S O'Reilly, **U F Lingappa**, K Metcalfe, D A Fike, J P Grotzinger, W W Fischer, A H Knoll. “Taphonomy of biosignatures in microbial mats on Little Ambergris Cay, Turks and Caicos Islands.” *Frontiers in Earth Science* 8:576712 (2020).

U F Lingappa, D Monteverde, J Magyar, J S Valentine, W W Fischer. “How manganese empowered life with dioxygen (and vice versa).” *Free Radical Biology and Medicine* 140:113-125 (2019).

- Featured on NASA Astrobiology Portal, April 2019.

[<https://astrobiology.nasa.gov/news/how-manganese-played-a-pivotal-role-in-photosynthesis-and-oxidation-protection/>]

U F Lingappa, W W Fischer. “Oxygenic Photosynthesis.” Entry in: Gargaud M et al. (eds) *Encyclopedia of Astrobiology*. Springer, Berlin, Heidelberg (2019).

E J Trower, M Cantine, M Gomes, **U F Lingappa**, S O'Reilly, T M Present, N Stein, J V Strauss, M P Lamb, J P Grotzinger, A H Knoll, W W Fischer. “Active ooid growth driven by sediment transport in a high energy shoal, Little Ambergris Cay, Turks and Caicos Islands.” *Journal of Sedimentary Research* 88(9):1132-1151 (2018).

U F Lingappa*, X Wu*, A Macieik, S F Yu, A Atuegbu, J Francis, C Nichols, A Calayag, H Shi, J A Ellison, E K T Harrell, V Asundi, J R Lingappa, M D Prasad, W I Lipkin, D Dey, C R Hurt, V R Lingappa, W J Hansen, C E Rupprecht. 2013. “Host-rabies virus protein-protein interactions as druggable antiviral targets.” *Proceedings of the National Academy of Sciences* 110(10):E861-868 (2013).

- Featured in *Cell Select Leading Edge*, May 2013. [[https://www.cell.com/cell/pdf/S0092-8674\(13\)00515-1.pdf](https://www.cell.com/cell/pdf/S0092-8674(13)00515-1.pdf)]

CONFERENCE ABSTRACTS

[†]presentation by Lingappa mentee

J L Edwards[†], **U F Lingappa**, J L Chastain, E S Sindermann, S Dupuis, S Merchant. “Decoding variant algal-bacterial interactions.” Yosemite Symbiosis Workshop, 2024.

U F Lingappa, S Dupuis, J L Chastain, J L Edwards, E S Sindermann, R Craig, R Stuart, P K Weber, X Mayali, S S Merchant. “*Chlamydomonas reinhardtii* from biological model to ecological subject.” Gordon Research Conference on Geobiology, 2024; Yosemite Symbiosis Workshop, 2024.

T A Lincoln, **U Lingappa**, B Hibner, J C Cameron, C Brininger, E Trower. “Quantification of microboring extent in experimental carbonate substrates by euendolithic cyanobacteria” Rocky Mountain Geobiology Symposium, 2024.

J L Chastain[†], S Dupuis, E S Sindermann, S Merchant, **U F Lingappa**. “Algal-bacterial symbioses in the soil microbial community.” American Geophysical Union fall meeting, 2023.

T A Lincoln, **U Lingappa**, B Hibner, J C Cameron, C Brininger, E Trower. “Assessing the driver of microboring by euendolithic cyanobacteria in modern carbonate sediment.” American Geophysical Union fall meeting, 2023.

U F Lingappa, S Dupuis, E S Sindermann, J L Chastain, R Craig, X Mayali, P K Weber, R Stuart, S Merchant. “Metabolic interactions and physical associations between *Chlamydomonas reinhardtii* and bacterial symbionts.” International Conference on the Cell and Molecular Biology of Chlamydomonas, 2023.

E S Sindermann[†], S Dupuis, J L Chastain, S Merchant, **U F Lingappa**. “Insights into algal diel physiology and biotic interactions from field isolates of *Chlamydomonas reinhardtii*.” Southern California Geobiology Symposium, 2023; International Conference on the Cell and Molecular Biology of Chlamydomonas, 2023.

J L Chastain[†], S Dupuis, E S Sindermann, X Mayali, P K Weber, R Stuart, S Merchant, **U F Lingappa**. “Metabolic exchanges between soil bacteria and a unicellular Chlorophyte.” Southern California Geobiology Symposium, 2023; International Conference on the Cell and Molecular Biology of Chlamydomonas, 2023.

P C Kemeny, D Johnson, **U F Lingappa**, A A Phillips. “Replaying the Tape of Academia: Alternative Systems for Earth Science.” American Geophysical Union fall meeting, 2022.

U Lingappa. “The connate roles of manganese in the natural history of Cyanobacteria.” Gordon Research Conference on Geobiology, 2022.

T Lincoln, **U Lingappa**, B Hibner, L Capece, J Cameron, E Johnson, E Trower. “Uncovering the advantage of microboring for endolithic Cyanobacteria.” Geological Society of America annual meeting, 2022.

W Fischer, **U F Lingappa**, J S Valentine. “The rise of dioxygen—a planetary revolution.” European Bioenergetics Conference, 2022.

T Present, **U Lingappa**, M Ingalls, J Grotzinger. “Recognition of Paleoproterozoic alkaline environments.” Simons Collaboration on the Origins of Life Annual Symposium, 2020.

M Gomes, C Howard, E J Trower, E C Sibert, T M Present, **U Lingappa**. “Carbon isotope signatures in microbial mat carbonates—how do different carbonate components record information about local versus global carbon cycling?” Geological Society of America annual meeting, 2020.

U F Lingappa, W W Fischer, E J Trower. “Ecophysiology of ooid microborings excavated by endolithic Cyanobacteria.” American Geophysical Union fall meeting, 2019.

E Trower, T Mahseredjian, I Overeem, M Gomes, C Howard, **U Lingappa**, T Present, E Sibert. “Grain-Trapping by Microbial Mats—A Key Mechanism of Sediment Accumulation in Mangroves?” American Geophysical Union fall meeting, 2019.

J Magyar, **U Lingappa**, D Monteverde, J Valentine, A Sharma, B Hoffman, W Fischer. “Cyanobacterial Mn(II) as Defense Against Oxidative Stress.” Goldschmidt, 2019.

R Marti-Arbona, N Lanza, M Teshima, **U Lingappa**, W Fischer, C Yeager. “Rock Varnish: Implications for Biosignatures on Mars.” Goldschmidt, 2019.

N L Lanza, W W Fischer, C Yeager, **U Lingappa**, A M Ollila, P J Gasda, S N Lamm, M Salvatore, S M Clegg, R C Wiens. “Targeting Manganese Minerals on Mars as Potential Biosignatures.” Mars Extant Life, 2019.

C Yeager, N Lanza, R Marti-Arbona, M Teshima, **U Lingappa**, W Fischer. “Terrestrial Rock Varnish: Implications for Biosignatures on Mars.” Mars Extant Life, 2019.

W Fischer, **U Lingappa**, E Trower, J Magyar, S Slotznick, J Johnson, S Webb, C Ma, Y Guan, B Rasmussen, Y Liu. “Chemical Imaging Approaches to Untangle Depositional and Post-Depositional Processes in Ancient Rocks on Earth and Mars.” Goldschmidt, 2018.

U Lingappa, W Fischer, N Lanza, J Challacome, C Yeager. “Microbial inhabitants of rock varnish: visitors or niche specialists.” Goldschmidt, 2018.

J Magyar, **U Lingappa**, D Monteverde, J Valentine, W Fischer. “Manganese Speciation in Modern Cyanobacteria and its Relationship to the Evolution of Photosynthesis.” Goldschmidt, 2018.

U Lingappa, H Johnson, J Hemp, J Magyar, D Monteverde, J Valentine, W Fischer. “Manganese oxidation by Cyanobacteria and the evolution of photosystem II.” International Society of Photosynthesis Research Conference on Microbial Photosynthesis, 2018.

J Hemp, R Soo, P Shih, L Ward, **U Lingappa**, L Pace, P Hugenholtz, W Fischer. “Evolution of photosynthesis.” International Symposium on Photosynthetic Prokaryotes, 2018.

E Trower, M Cantine, M Gomes, **U F Lingappa**, S O'Reilly, T M Present, N Stein, J V Strauss, M P Lamb, J P Grotzinger, A H Knoll, W W Fischer. "Physical, Chemical, and Microbial Controls on Growth and Degradation of Ooids on Ambergris Shoal, Little Ambergris Cay, Turks and Caicos Islands, British Overseas Territories." American Association of Petroleum Geologists annual meeting, 2018.

J Grotzinger, M Gomes, **U Lingappa**, N Stein, E Trower, J Alleen, A M Bahniuk, M Cantine, H Grotzinger, K Metcalfe, D K Morris, S O'Reilly, E Orzechowski, D Quinn, C Sanders, E Sibert, J Strauss, M Tarika, M Thorpe, W Fischer, A Knoll. "Diverse and Spatially Extensive Microbial Mat and Ooid Sand Depositional System, Little Ambergris Cay, Turks and Caicos Islands." American Association of Petroleum Geologists annual meeting, 2018.

T M Present, E Trower, M Gomes, **U Lingappa**, N Stein, M Thorpe, M Tarika, J Alleen, A M Bahniuk, D K Morris, E Orzechowski, C Sanders, E Sibert, W Fischer, A Knoll, J Grotzinger. "Sedimentology and Geochemistry of Ooid Sands Buried Beneath Microbial Mats, Little Ambergris Cay, Turks and Caicos Islands." American Association of Petroleum Geologists annual meeting, 2018.

N Stein, D Quinn, J Grotzinger, W Fischer, B Ehlmann, M Gomes, A Hayden, **U Lingappa**, A Knoll, E Trower. "Distribution of and Environmental Impacts on Microbial Mat Ecosystems of Little Ambergris Cay, Turks and Caicos." American Association of Petroleum Geologists annual meeting, 2018.

U Lingappa, M Gomes, K Metcalfe, L Riedman, S O'Reilly, N Stein, E Trower, T M Present, W Fischer, A Knoll, J Grotzinger. "Ecology and Biogeochemistry of Microbial Mats on Little Ambergris Cay." American Association of Petroleum Geologists annual meeting, 2018.

J Magyar, **U Lingappa**, W Fischer. "Insights into Ancient Manganese Biogeochemistry from Studies of Modern Photosystem II." Gordon Research Conference on Metals in Biology, 2018.

N Stein, J P Grotzinger, A Hayden, D P Quinn, L Trower, **U Lingappa**, T M Present, M Gomes, E A Orzechowski, W W Fischer. "Impact of Hurricane Irma on Little Ambergris Cay, Turks and Caicos." American Geophysical Union fall meeting, 2017.

Y Liu, C Ma, Y Guan, J R Beckett, **U F Lingappa**, S M Webb, W W Fischer, A Allwood. "Diverse fluid activities on Mars: Zn-bearing silicate and oxide in Martian breccia meteorite Northwest Africa (NWA) 7533." Lunar and Planetary Science Conference, 2017.

M Gomes, L A Riedman, S O'Reilly, **U Lingappa**, K Metcalfe, N Stein, E A Orzechowski, J V Strauss, H Grotzinger, D P Quinn, L Trower, D Fike, J Grotzinger, A Knoll. "Linking the Modern to the Ancient with Morphological and Geochemical Signatures in Microbial Mats." Goldschmidt, 2017.

U Lingappa and W W Fischer. "Manganese and the Evolution of Photosystem II." Gordon Research Conference on Photosynthesis, 2017.

U Lingappa, H A Johnson, J Hemp, J S Valentine, W W Fischer. "Manganese Oxidation by Cyanobacteria and the Evolution of Photosystem II." Western Photosynthesis Conference, 2017; Southern California Geobiology Symposium, 2017.

M Gomes, **U Lingappa**, K Metcalfe, S S O'Reilly, L A Riedman, M Cantine, B Ireland, R Phillips, N Stein, E A Orzechowski, J V Strauss, H M Grotzinger, D P Quinn, L Trower, D Fike, W W Fischer, J P Grotzinger, A H Knoll. "Linking the modern to the ancient with a comprehensive geobiological understanding of biosignature preservation in microbial mats." American Geophysical Union fall meeting, 2016.

J P Grotzinger, A H Knoll, W W Fischer, M Cantine, M L Gomes, H M Grotzinger, **U Lingappa**, K Metcalfe, S S O'Reilly, E A Orzechowski, D P Quinn, L A Reidman, N Stein, J V Strauss, L Trower. "Context, Biogeochemistry, and Morphology of Diverse and Spatially Extensive Microbial Mats, Little Ambergris Cay, Turks and Caicos Islands, BWI." American Geophysical Union fall meeting, 2016.

N T Stein, D P Quinn, J P Grotzinger, W W Fischer, A H Knoll, M Cantine, M L Gomes, H M Grotzinger, **U Lingappa**, K Metcalfe, S S O'Reilly, E A Orzechowski, L A Reidman, J V Strauss, L Trower. "UAV, DGPS, and Laser Transit Mapping of Microbial Mat Ecosystems on Little Ambergris Cay, BWI." American Geophysical Union fall meeting, 2016.

L Trower, M Cantine, S S O'Reilly, J V Strauss, M L Gomes, H M Grotzinger, J P Grotzinger, A H Knoll, M P Lamb, **U Lingappa**, K Metcalfe, E A Orzechowski, D P Quinn, L A Reidman, N Stein, W W Fischer. "Evidence of Active Ooid Growth from Little Ambergris Cay, Turks and Caicos Islands, BWI." American Geophysical Union fall meeting, 2016.

E A Orzechowski, J V Strauss, A H Knoll, W W Fischer, M Cantine, K Metcalfe, D P Quinn, N Stein, M L Gomes, H H Grotzinger, **U Lingappa**, S O'Reilly, L A Reidman, L Trower, J P Grotzinger. "Age and Construction of Little Ambergris Cay Bedrock Rim, Southeastern Caicos Platform, British West Indies." American Geophysical Union fall meeting, 2016.

U Lingappa, E K Rankin-Gee, M Lera, B Bebout, O Marcu. "Molecular and biochemical responses of *Volvox carteri* to oxidative stress." Search for Life Beyond the Solar System: Exoplanets, Biosignatures & Instruments conference, 2014.

D YoungSmith, M Brann, **U Lingappa**, E K Rankin-Gee, B Bebout, O Marcu. "The role of oxidative stress in the evolution of multicellularity." Search for Life Beyond the Solar System: Exoplanets, Biosignatures & Instruments conference, 2014.

U Lingappa. "Anti-rabies drug discovery targeting host-virus protein-protein interactions." Bay Area Symposium on Viruses, 2013.

U F Lingappa, X Wu, A Macieik, K Paulvannan, D Solas, A Atuegbu, K Tsutsui, V R Lingappa. “Molecular dissection of the timing and mechanism of action of a small molecule with robust activity against host factors that participate in rabies virus capsid assembly.” International Conference on Antiviral Research, 2013.

E K Rankin-Gee, M Lera, **U Lingappa**, B Bebout, O Marcu. “Molecular and biochemical responses of *Volvox carteri* to oxidative stress.” American Society for Cell Biology meeting, 2012.

V R Lingappa, **U Lingappa**, E Borst, J Pajda, I Brown, S Long, B Rami, A Nalca, W I Lipkin, C Rupprecht, M Messerle, C R Hurt, W Hansen. “Overlap in virus specificity leads to the discovery of small molecules active against rabies virus, monkey pox virus, and cytomegalovirus.” International Conference on Antiviral Research, 2010