

## **Cody Springer Sheik Ph.D.**

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### **Education**

- Ph.D. Microbiology, Dept. of Botany and Microbiology 2011  
Thesis: Response of the soil microbiome to climate change  
Mentor: Dr. Lee Krumholz  
University of Oklahoma, Norman, OK, 73019
- B.Sc. Zoology, Dept. of Zoology 2004  
Emphasis in Ecology, Minors in Botany and Chemistry  
University of Oklahoma, Norman, OK, 73019

### **Appointments**

Assistant Professor, 2015-Present

- Department of Biology, University of Minnesota Duluth, Duluth, MN. (Tenure home)
- Large Lakes Observatory, University of Minnesota Duluth, MN.

Postdoctoral Research Fellow, 2011-2015

- Dept. of Earth and Environ Sciences, University of Michigan, Ann Arbor, MI.
- Dept. of Ecology and Evolutionary Biology, University of Michigan, Ann Arbor, MI.

Guest Investigator, 2011-2015

- Applied Ocean Physics and Engineering Dept., Woods Hole Oceanographic Institution, Woods Hole, MA.

Graduate Research Assistant, 2004-2011

- Dept. of Botany and Microbiology, University of Oklahoma, Norman, OK.

Undergraduate Research Assistant, 2001-2003

- Global Climate Change Lab supervised by Dr. Yiqi Luo and Dr. Linda Wallace. Dept. of Botany and Microbiology, University of Oklahoma, Norman, OK.

## Research Interests

General: Aquatic geomicrobiology, subsurface microbiology, microbial ecology and diversity, microbial physiology, and cyrosphere.

Specific Areas of Interest: Sediment water interactions, aquatic ecosystem functioning, biogeography of microbial life, and impacts of climate change on biogeochemical cycles.

## Cruise Experience

- *R/V Lake Guardian* 2016 (August): USEPA-GLNPO phytoplankton L. Superior
- *R/V Blue Heron* 2016 (August): Summer sampling of Lake Superior's Western Arm
- *R/V Blue Heron* 2016 (May): Spring sampling of Lake Superior's Western Arm
- *R/V Lake Guardian* 2016 (April): USEPA-GLNPO phytoplankton L. Superior
- *R/V Blue Heron* 2015 (November): Late season sampling and equipment deployment
- *R/V Blue Heron* 2015 (July): Summer sampling of Lake Superior's Western Arm
- *R/V Falkor* 2013: Hydrothermal exploration and sampling from Mid-Cayman Rise.
- *R/V R5002 Storm* 2012: Microbiology of submerged sinkholes in NW Lake Huron.

## Field Sampling Experience

- Experimental Lakes Area Canada (ELA, 2016): Preliminary sampling of interconnected lakes for microbes, phytoplankton, and zooplankton.
- Lake Brownie Minneapolis, MN (2016): Preliminary sampling of a small meromictic, iron rich lake for novel microbial life.
- Fumarole sampling Azores 2015: Assessed the biogeochemistry from an active fumarole field near the city of Furnas on the island of São Miguel.
- Greenland Glacial Expedition 2013: Sampling from glaciers and marine systems across several outlet glaciers.
- Microbial sampling of Oklahoma prairie soils 2004-2010: Routine soil sampling of experimental warming field plots in Central Oklahoma.
- Sampling and maintenance of Oklahoma prairie soils 2002-2003: Routine maintenance and soil, plant, and ground water sampling from experimental warming and precipitation plots in Central Oklahoma.

## Funding

### Funded

2017

- NSF Low Temperature Geobiology and Geochemistry (2017): (\$490,000) Collaborative Research: Biosignatures of coupled iron and carbon cycling in furruginous lakes. (Co-PI, Bioinformatic and sequencing support)
- University of Minnesota Duluth Advance Materials Center Pilot Grant (2017): (\$25,000)

Synthesis of highly branched isoprenoid membrane lipids: An interdisciplinary approach to identify the genetic and biochemical basis of branched lipids in a modern diatom (Co-PI)

2016

- USEPA GLNPO-CSMI- Applying meta 'omics approaches to study the stress response and phylogeny of phytoplankton in the Great Lakes. (\$75,000)
- Department of Energy Joint Genome Institute, "Translating stoichiometric diversity into genomic diversity: What genomic elements are responsible for variability in bacterial biomass stoichiometry?". Genome sequencing (Co-PI)
- University of Minnesota Sequencing Core Pilot sequencing grant (Pilot Metagenomes)
- Deep Carbon Observatory, Census of Deep Life (Co-PI). Microbiome of fumaroles from the mid-Atlantic ridge. (Pilot metagenome sequencing, awarded but declined)

*Pre-faculty time*

- Travel and accommodation grant for Census of Deep Life meeting Lisbon, Portugal (2015)
- Travel and accommodation grant for Deep Carbon Observatory meeting Munich, Germany (2015)
- Deep Carbon Observatory, Census of Deep Life (Co-PI). Microbial life in an underground ocean: Metagenomics of the Soudan Iron Mine. (Pilot metagenome sequencing funding)
- Sloan Foundation (Co-PI): Funding for Early Career Scientist Workshop 2015 (\$75,000)
- Travel and accommodation grant for Deep Carbon Observatory, Early Career Summer School (2014)
- Travel and accommodation grant for Deep Energy Biosphere Institute, Bioenergetics and subsurface metabolism (2014)
- Travel and accommodation grant for Deep Life Directorate of the Deep Carbon Observatory (2013)
- Travel grant for the Gordon Research Conference on Marine Microbes (2012)
- Mr. and Mrs. W.O. Wethington Graduate Fellowship (\$20,000)

Pending Research Proposals

- NSF Low Temperature Geobiology and Geochemistry (2017, resubmission): Does organic sulfur make a significant and overlooked contribution to sediment sulfate reduction in low-sulfate environments? (Co-PI)
- NASA Exobiology (2017 Resubmission): Rock Composition controls on habitability (Co-PI)
- NSF Integrated Earth Sciences (2017-Resubmission): Collaborative Research: Banded together: modern water-microbe-mineral feedbacks in the deep Archean lithosphere. (Co-PI).

**Courses taught**

- General Microbiology (Spring and Fall 2016, Fall 2017)
- Bioinformatics for Biologists (Developed, Spring 2017, Spring 2018)
- Special topic in Geology: Geobiology, Slime through time (Developed, Spring 2018)

**Postdoctoral Research Scientist Mentoring**

- Dr. Ana Morales (Co-advising, 2016-17) University of Minnesota
  - Currently Assistant Professor University of Vermont

**Graduate Student Mentoring**

- Jennifer Knack (Ph.D. co-advising, 2016-present) University of Minnesota Duluth
- Jake Callaghan (PhD 2017-present) University of Minnesota Duluth
- Gage Sachs (Masters co-advising, 2016-present) University of Minnesota Duluth

**Undergraduate Student Mentoring**

- Haley Ersfeld (Spring 2018) University of Minnesota Duluth
- Adam Olson (2016-present)\* University of Minnesota Duluth
- Gunnar Frahm (2017-present) University of Minnesota Duluth
- Marissa Reed (2016-17) University of Minnesota Duluth
- Benjamin Block (2016-17) University of Minnesota Duluth
- Hannah Kreibach (2016-17)\* University of Minnesota Duluth
- Kendall Carden (2016-spring) University of Minnesota Duluth
- Austin Sailer (2016 Summer) University of Minnesota Duluth
- Paul Den Uyl (2012-13) University of Michigan
- Matthew Sabuda (2012-13) University of Michigan
- Grace Tsaloff (2013-2014) University of Michigan

\*Indicates Undergraduate Research Opportunity Students (UROP)

**Professional Training**

- Deep Carbon Observatory, Earth in Five Reactions (March 2018)
- NSF Continental Scientific Drilling Coordination Office (CSDCO) Planning workshop (April 2017)
- Deep Carbon Observatory, Early Career Summer School (August 2017)
- Census of Deep Life Synthesis meeting (September 2017)
- Census of Deep Life Synthesis meeting (May 2016)
- Mining, Metals, and Microbes in Minnesota - North (Oct. 2014)
- Deep Carbon Observatory, Early Career Summer School (July 2014)
- Deep Energy Biosphere Institute, Bioenergetics and subsurface metabolism (2014)
- Mining, Metals, and Microbes in Minnesota (March, 2014)
- Marine Microbiology Initiative Research Associate and Postdoctoral Summit (2014)

- Deep Life Directorate of the Deep Carbon Observatory (2013)

### Leadership and Organizational Activities

- Deep Carbon Observatory, Early Career Scientist Workshop coordinator (2014-15)
- Goldschmidt session organizer (2016)
  - Coupled Biogeochemical Cycling of Iron, Manganese, Sulfur, Chromium and associated elements: past and present
  - Sources and Fate of Carbon in Hydrothermal Systems

### Professional Society Memberships

- American Society for Microbiology
- International Society for Microbial Ecology
- American Geophysical Union
- European Geophysical Union

### Manuscript Referee

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| • BMC Bioinformatics                   | • International Society for Microbial Ecology Journal (ISME J) |
| • Environmental Science and Technology | • Frontiers in Microbiology                                    |
| • FEMS Microbiology                    | • Journal for Great Lakes Research                             |
| • Microbiome                           | • Applied and Environmental Microbiology                       |
| • Oecologia                            | • Geobiology   |
| • PLoS One                             | • Scientific Reports   |
| • Microbial Ecology                    |  |
| • Environmental Microbiology           |  |

### Proposal Review

- NASA, NSF, Schmidt Oceanographic Institute

### Editorial Service:

- Editorial Board: Applied and Environmental Microbiology (2017-2019)
- Guest Associate Editor Frontiers in Earth Science: Deep Carbon in Earth: Early Career Scientist Contributions to the Deep Carbon Observatory (2016-present)

**Refereed Manuscripts** h-index 11 (ISI), 13 (Google Scholar) \*Indicates Ph.D. Work, # Indicates Sheik Lab students

1. **Cody S. Sheik**, Reese, Brandy Kiel, Sylvan, J.B., Grim, S.L., Schrenk, M.O., Sogin, M.L., Colwell, F. (2018). Identification and removal of contaminant sequences from ribosomal gene databases: Lessons from the Census of Deep Life. *Frontiers in Microbiology* (In Press)
2. Arendt, C.A., Aciego, S.M., Sims, K.W.W., Das, S.B., **Cody S. Sheik** and Stevenson, E.I.. (2018) GrIS outlet glacier subglacial water residence times and proximal seawater U

- chemistry: Implications for seawater ( $^{234}\text{U}/^{238}\text{U}$ )<sub>ACT</sub> on glacial-interglacial timescales. *Geochimica et Cosmochimica Acta* (In Press)
3. **Cody S. Sheik**, Sieber, J.R., Badalamenti, J.B., #Carden, K., and #Olson, A. (2017) Complete genome of *Desulfovibrio desulfuricans* strain G11, a model sulfate reducing, hydrogenotrophic syntrophic partner organism. *Genome Announcements*, 5(43), e01207-17. doi: <https://doi.org/10.1128/genomeA.01207-17>.
  4. Kinsman-Costello, L.E., **Sheik, Cody S.**, Sheldon, N., Burton, A.G., Costello, D., Marcus, D., Uyl, P.D., Dick, G.J. (2017) Groundwater shapes sediment biogeochemistry and microbial diversity in a submerged Great Lake sinkhole. *Geobiology* 15(2): 224-239.
  5. James, K.L., Rios-Hernandez, L.A., Wofford, N., Mouttaki, H., Sieber, R.R., **Sheik, Cody S.**, Yang, Y., Xie, Y., Rohlin, L., Loo, J.A., Loo, R.R.O., Hurst, G.B., Gunsalus, R.P., and McInerney, M.J. (2016) A new twist on ATP formation: pyrophosphate-dependent ATP synthesis by the syntrophic fatty and aromatic acid degrader, *Syntrophus aciditrophicus*. *MBIO* 7(4): e01208-16. DOI: 10.1128/mBio.01208-16.
  6. **Sheik, Cody S.**, Stevenson, E.I., Uyl, P.D., Aciego, S.M., Dick, G.J. (2015) Glacial discharge associated microbial communities exhibit temporal stability and correlate with spatial geochemistry. *Frontiers in Microbiology* 6.
  7. Sieber, J.R., Crable, B.R., **Sheik, Cody S.**, Hurst, G.B., McInerney, M.J. (2015) Novel proteins required for syntrophic growth revealed by high-throughput shotgun proteomics of *Syntrophomonas wolfei*. *Frontiers in Microbiology* DOI: 10.3389/fmicb.2015.00115
  8. Krumholz, L.R., Bradstock, P., **Sheik, Cody S.**, Diao, Y., Ozcan G., Gorby, Y., McInerney, M.J., Wall, J.D. (2015) Transposon gene mutants of *Desulfovibrio alaskensis* reveal genes necessary for syntrophic growth. *Appl Environ Microbiol* DOI:10.1128/AEM.03358-14
  9. **Sheik, Cody S.**, Anantharaman, K., Breier, J.A., Sylvan, J.B., Edwards, K.J., Dick, G.J. (2015) Spatially resolved sampling reveals dynamic microbial communities in rising hydrothermal plumes across a back-arc basin. DOI: 10.1038/ismej.2014.228
  10. Breier, J.A., **Sheik, Cody S.**, Gomez-Ibanez, D., Sayre-McCord, R.T., Sanger, R., Rauch, M., Coleman, M., Bennett, S., Toner, B., Dick, G.J. (2014) A large volume particulate and water multi-sampler with *in situ* preservation for microbial and biogeochemical studies. *Deep-Sea Research Part 1*, DOI: 10.1016/j.dsr.2014.08.008
  11. Li, Meng, Toner, B.M., Baker, B.J., Breier, J.A., **Sheik, Cody S.**, and Dick, G.J. (2014) Microbial iron uptake as a mechanism for dispersing iron from deep-sea hydrothermal vents. *Nat Comm*, 5: Article 3192, DOI: 10.1038/ncomms4192
  12. **Sheik, Cody S.**, Jain, S., and Dick, G.J. (2014) Metabolic flexibility of enigmatic SAR324 revealed through metagenomics and metatranscriptomics. *Environ Microbiol.* 16 (1): 304-317.
  13. Baker, B.J., **Sheik, Cody S.**, Taylor, C. A., Jain, S., Bhasi, A., Cavalcoli, J.D., and Dick, G.J. (2013) Community transcriptomic assembly reveals novel and low abundance microbes that contribute to deep-sea carbon and nitrogen cycling. *ISME J.* 7:1962-1973.
  14. Anantharaman, K., Breier, J.A., **Sheik, Cody S.**, and Dick, G. J. (2013) Evidence for hydrogen oxidation and metabolic plasticity in widespread deep-sea bacteria. *PNAS* 110(1): 330-335.

15. \***Sheik, Cody S.**, Mitchell, T.W., Rizvi, F.Z., Rehman, Y. Faisal, M., Hasnain, S., McInerney, M.J., and Krumholz, L.R. (2012) Exposure of Soil Microbial Communities to Chromium and Arsenic Alters their Diversity and Structure. *PLoS ONE* **7**(6): e40059. doi:10.1371/journal.pone.0040059
16. \***Sheik, Cody S.**, Beasley, W.H., Elshahed, M.S., Zhou, X., Luo, Y., and Krumholz, L.R. (2011) Response of microbial communities to simulated global warming and in a tallgrass prairie. *ISME J.* **5**:1692-1700.
17. \*Castaneda-Carrion, N.I., **Sheik, Cody S.**, and Krumholz, L.R. (2010) *Desulfovibrio africanus* subsp. *unoflagellum* subsp. nov., a sulfate-reducing bacterium from a uranium contaminated subsurface aquifer. *IJSEM.* **60**:880-886.
18. \*Youssef, N., **Sheik, Cody S.**, Krumholz, L.R., Najjar, F.Z., Roe, B.A., and Elshahed, M.S. (2009) A comparative study of species richness estimates obtained using near complete fragments and simulated pyrosequencing-generated fragments in a 16S rRNA gene-based environmental surveys. *Appl. Environ. Microbiol.* **75**:5227-5236.
19. \*Elshahed, M., Youssef, N.H., Spain, A.M., **Sheik, Cody**, Najjar, F.Z., Sukharnikov, L.O., Roe, B.A., Davis, J.P., Schloss, P.D., Bailey, V.L., and Krumholz, L.R. (2008) Novelty and uniqueness patterns of rare members of the soil biosphere. *Appl. Environ. Microbiol.* **74**: 5422-5428.

### Review manuscripts

1. Dick, G.J., Anantharaman, K., Baker, B.J., Li, M., Reed, D.C., and **Sheik, Cody S.** (2013) The microbiology of deep-sea hydrothermal vent plumes: ecological and biogeographic linkages to seafloor and water column habitats. *Frontiers of Microbiology* **4**:124.

### Book Editor/Editorial Article

1. D. Giovanelli, B. Black, A. D. Cox, and **C. S. Sheik** (Eds., 2017), *Deep Carbon in Earth: Early Career Scientist Contributions to the Deep Carbon Observatory*. Frontiers Research Topic EBook. [https://www.frontiersin.org/books/Deep\\_Carbon\\_in\\_Earth\\_Early\\_Career\\_Scientist\\_Contributions\\_to\\_the\\_Deep\\_Carbon\\_Observatory/1392](https://www.frontiersin.org/books/Deep_Carbon_in_Earth_Early_Career_Scientist_Contributions_to_the_Deep_Carbon_Observatory/1392)
2. Giovanelli, D., Cox, A. D., Black, B., & **C.S. Sheik** (2017). *Editorial: Deep Carbon in Earth: Early Career Scientist Contributions to the Deep Carbon Observatory* (89th ed., vol. 5). Frontiers. <https://doi.org/10.3389/feart.2017.00089>

### Manuscripts in review

1. Brandi R Cron, **Cody S. Sheik**, Fotios-Christos A Kafantaris, Gregory K Druschel, Christopher R German, Gregory J Dick, John A Breier, and Brandy Toner. Particulate sulfur speciation reveals diverse and dynamic geochemistry in a buoyant hydrothermal plume. *Geochimica et Cosmochimica Acta*

### Manuscripts in Prep

1. **Sheik, C.**, Cron, B., Toner, B., Breier, J., Jain, S., & Dick, G. Contrasting hydrothermal fields at Mid-Cayman Rise host dissimilar rising plume microbial communities. (Nearing submission 2017).
2. **Sheik, C.**, Sailor, A., & Halbur, J. Contributions of relic DNA in sediments and its implication on carbon cycling, paleo reconstruction, and microbial ecology
3. Toner, B., **Sheik, C.**, Lindsey, B., Jeff, G., & Gregory, D. Geomicrobiology of subsurface brines associated with banded iron formations
4. **Sheik, Cody S.**, Stevenson, E.I., Uyl, P.D., Aciego, S.M., Dick, G.J. Regional comparison of microbial communities from Greenland Ice Sheet subglacial outflows.
5. **Sheik, Cody, S.**, Schreiner, K. M., Steinman, B. A., Ozersky, T., Halbur, J. <sup>15</sup>N indicates an active N-cycling microbial community in low carbon, freshwater sediment. (Nearing submission 2017).

## Presentations

### Invited

- Earth in 5 Reactions: Keynote: Bringing the Earth's carbon cycle to life: microbial metabolism through time. (2018)
- Lehigh University: Microbial biogeochemical cycling in an oligotrophic sediment. (2018)
- Central Michigan University Biological Station: Elucidating the biogeochemical of novel microorganisms from oligotrophic, freshwater sediments (2017)
- University of Calgary: Biogeochemical of novel microorganisms from oligotrophic, freshwater sediments (2017)
- Microbes and Lakes: deciphering the biogeochemical roles of the unseen majority. Experimental Lakes Area Canada. (2016)
- Geomicrobiology of Lake Superior! University of Wisconsin Superior. (2016)
- Geomicrobiology and you! University of Minnesota Duluth. (2016)
- Geomicrobiology of deep-ocean hydrothermal vent plumes. University of Minnesota. (2015)
- Life in the deep ocean; Geomicrobiology of hydrothermal vents. Ferris State University. (2014)
- High throughput 'omics and the potential for real-time tracking of environmental pollutants with microorganisms. Mining, Metals and Microbes in Minnesota. University of Minnesota- Twin Cities. Minneapolis, MN. (2014)
- Leveraging post-sequencing methods to assemble genomes of enigmatic microbes from deep-sea hydrothermal vents. Gordon and Betty Moore Foundation, Marine Microbiology Initiative - Research Associate and Postdoctoral Scholar Summit (MMI-RAPs), Dorado, Puerto Rico. <http://dx.doi.org/10.6084/m9.figshare.915377> (2014)
- Deep brine waters host low diversity microbial communities at Soudan Iron Mine. Deep Carbon Observatory Directorate Meeting. Portland, OR. (2013)
- Meta'Omics approaches reveal the potential ecophysiology of a ubiquitous, deep sea, deltaproteobacterium. Invited speaker at the Michigan Chapter of ASM regional Meeting.



(2013)

- Application of meta'omics to understand the microbiology of the deep-sea. NCIBI Tools and Technology Seminar, University of Michigan. (2012)

### Outreach

- The Good, Bad and Ugly: The many faces of aquatic microbes. Public Lecture as part of the R/V Blue Heron's Science on Deck (2017)
- Science on Tap: A booth presentation on "Fermentations that build nations". Public Lecture hosted by UMD Swenson College of Science and Engineering and Clyde Iron Works (2017)
- Science on Tap: A booth presentation on the flavors of fermentation and brewing. Public Lecture hosted by UMD Swenson College of Science and Engineering and Bent Paddle Brewing company (2016)
- Microbial Life in Lake Superior: Exploring tiny organisms in a Large Lake. Public Lecture as part of the R/V Blue Heron's Science on Deck (2016)

### Conference talks and posters

Lambrecht, N., Swanner, E., Wittkop, C., **Sheik, Cody S.**, and Katsev, S. (2018) Microbial communities of two Archean ocean analogs. GSA North-Central 52nd Annual Meeting.

**Sheik, Cody S.** (2017) Shedding light on microbially driven biogeochemical cycles in freshwater sediments. Goldschmidt – Paris.

Stevenson, E.I., Williams, H.M., Robbins, M.J., **Sheik, Cody S.**, Aciego, S.M. (2017) The iron isotope composition of Northern Hemisphere glacial systems. Goldschmidt – Paris.

**Sheik, Cody S.** (2017) Extreme Microbes in Action: Integrating geochemistry, genomics and culturing to understand microbially driven low temperature processes. DCO-Early Career Scientist Workshop.

**Sheik, Cody S.** (2016) Elucidating the biogeochemical roles of novel microorganisms from oligotrophic Lake Superior sediments. AGU General meeting

Giovannelli, D., Cox, A., Hummer, D., Pratt, K., **Sheik, C. S.**, Thomas, D., Viveiros, F., (2016) Multidisciplinary field surveys as the norm: Integrating geosciences to characterize the fate of carbon in a geothermal fumarole. AGU General meeting

**Sheik, Cody S.**, Stevenson, E.I., Dick, G.J., Cory, R., Arednt, C.S., Aciego, S. (2016) Chemosynthetic microbial processes in glacier outflows in southern Greenland. Goldschmidt - Japan.

Katsev, S., Fakhraee, M., Li, J., Schreiner, K., and **Sheik, C.S.** (2016) Does organic sulfur make a significant and overlooked contribution to sedimentary S cycling in low sulfate environments? Goldschmidt - Japan.

Stevenson, E.I., Fantle, M., Williams, H., Das, S., **Sheik, C.S.**, and Aciego, S. (2016) Iron

isotope fractionation in subglacial systems. Goldschmidt - Japan.

Cron, B., Toner, B., Breier, C., Dick, G., Jiang, H., and **Sheik, C.S.** (2016) Organic carbon and iron-rich particles in deep ocean hydrothermal plumes, Von Damm vent field, Mid-Cayman Rise. Goldschmidt – Japan.

Kinsman-Costello, L.E., **Sheik, C.S.**, Burton, G.A., Sheldon, N.D., and Dick, G.J. (2016) Microbial ecology and biogeochemistry of a high-sulfur submerged sinkhole in Lake Huron, MI. International Association for Great Lakes Research.

Schreiner, K., Bramburger, A., Ozersky, T., **Sheik, C.S.**, and Steinman, B. (2016) The biological pump and lower trophic level controls on carbon cycling in Lake Superior: insights from a multi-pronged study. ASLO.

First authored only pre-faculty time

**Sheik, Cody S.** (2015) Function of enigmatic microbes at the deepest hydrothermal vents on earth. Deep Carbon Observatory Early Career Workshop. Ponta Delgada, Azores, Portugal.

**Sheik, Cody S. and Dick, G.J.** (2014) Unraveling the function of enigmatic microbes in deep ocean hydrothermal plumes. Deep Carbon Observatory Summer School. Big Sky, MT

**Sheik, Cody S.**, Anantharaman, K., Baker, B.J., Li, M., Dick, G.J. (2014) Unraveling the function of enigmatic microbes and viruses with metagenomics and metatranscriptomics in deep ocean hydrothermal plumes. ASLO/AGU Ocean Sciences.

**Sheik, Cody S.**, Stevenson, E.I., Aciego, S.M., Dick, G.J. (2013) Microbial community structure correlates with geochemical gradients from glacial discharge. Midwest Geomicrobiology Conference. Indianapolis, Indiana.

**Sheik, Cody S.**, Stevenson, E.I., Uyl, P.D., Aciego, S.M., Dick, G.J. (2013) Microbial communities correlate with Lemon Creek Glacier meltwater discharge. Mineralogical Magazine, 77(5) 2192. (Goldschmidt 2013)

**Sheik, Cody S.**, Anantharaman, K., Dick, G.J. (2012) Microbial community diversity across vertical and geographic gradients in deep-sea hydrothermal plumes. International Society for Microbial Ecology General Meeting. Copenhagen, Denmark.

**Sheik, Cody S.**, Jain, S., and Dick, G. (2012) Metabolic flexibility of deep-sea Sar324 revealed through metagenomic and transcriptomic analysis. GRC on Marine Microbes.

**Sheik, Cody S.**, Mitchell, T.M., Faisal, M., Hasnain, S., McInerney, M.J, Krumholz, L.R. (2011) Microbial diversity of soils chronically exposed to chromium and arsenic from tannery waste in Pakistan. American Society of Microbiology General Meeting. New Orleans, LA. Abstract number 11-GM-A-1880- ASM.

**Sheik, Cody S.**, Beasley, W.H., Elshahed, M.S., Zhou, X., Luo, Y., and Krumholz, L.R. Global warming coupled to drought alters microbial communities in a tallgrass prairie. (2010) Poster Presentation at the International Society for Microbial Ecology general meeting, Seattle, WA.

**Sheik, Cody S.**, Elshahed, M., Luo, Y., Wiley, G., Macmil, S., Qu, C., Wang, P., Roe, B.A., and Krumholz, L.R. (2009) Pyrosequencing reveals the effects of simulated warming on microbial abundances and diversities in a tall grass prairie. Ecological Society of America, Albuquerque, NM. Abstract No. COS 115-8.

**Sheik, Cody S.**, Elshahed, M., Luo, Y., Krumholz, L.R. (2009). Effects of global warming on microbial population dynamics in a tall grass prairie in central Oklahoma. American Society of Microbiology General Meeting. Philadelphia, PA. Poster number N-231.

**Sheik, Cody S.**, Elshahed, M., Luo, Y., Wiley, G., Macmil, S., Qu, C., Wang, P., Roe, B.A., and Krumholz, L.R. (2009). Dominant OTU0.03 response to warming in a tall grass prairie, a pyrosequencing approach. Missouri Valley Branch Regional Meeting, Lawrence, Kansas.

**Sheik, Cody S.**, Elshahed, M., Luo, Y., Krumholz, L.R. (2005) Fungal community response to global warming in a tallgrass prairie ecosystem. exas Branch and Missouri Valley Joint American Society of Microbiology meeting, Denton, Texas.

**Sheik, Cody S.**, Oliver, T., Wallace, L. (2003) Grasshopper herbivory of *Solidago speciosa* varies with distance from *Juniperus virginiana* in tallgrass prairie. Ecological Society of America, Savannah, Georgia. Poster No. 25 in the Herbivory Category.