

MYA BREITBART

University of South Florida
College of Marine Science
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Education

University of California San Diego & San Diego State University	Cell and Molecular Biology	Ph.D. 2006
Florida Institute of Technology	Biology	B.S. 2000

Appointments

Full Professor at the University of South Florida	2016-present
Associate Professor at the University of South Florida	2012-2016

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University of South Florida Honors and Awards Council, 2017-2020.

American Society for Microbiology 2017 Officer Nominating Committee.

USF CIDER (Center for Infectious Disease Ecology Research) Advisory Board. 2016-present.

USF Academy for Teaching and Learning Excellence (ATLE) Pedagogy All-Day Workshop.
January 2016.

Editor for Aqu

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Keynote speaker, Bright House Networks “Bright Ideas STEM From Today’s Youth” Semi-finalist Competition. 1/2016.

Various activities with Girls Incorporated and Girl Scouts at Camp Wai Lani, reaching over 500 girls. Ongoing.

Invited panelist, USF 11th annual diversity summit. 3/14.

Spoonbill Bowl Volunteer Moderator. 2014, 2015.

FabFems Role Model. 2013-present.

Leadership Team Member for Florida Girls Collaborative Project. 2010-present.

Designed a fully functional Marine Science Laboratory for Girl Scout Camp Wai Lani. 2011.

Designed and ran a Girl Scout Marine Science Workshop for an Girl Scout Encampment at Camp Wai Lani (150 Girls ranging from ages 5-13). 2009.

Co-organizer of a Girl Scout Marine Science and Technology Workshop at the College of Marine Science. 2008. <http://www.marine.usf.edu/news/girlscouts.shtml>

Faculty mentor for the USF Oceanography Camp for Girls. 2007-2011.

Created bilingual educational videos about microbialites in our field site of Cuatro Ciénegas, Mexico. 2007. http://www.desertfishes.org/cuatroc/literature/pdf/Breitbart_videos.php

Formal Courses Taught

Professional Development II (2-

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Professional Development (2-credit graduate-level professional development course; OCE6934), Fall 2012.

Foundations of Biological and Fisheries Oceanography (2 credit graduate-level readings course (OCE6934). Co-instructor with Kendra Daly and Pam Hallock-Muller. Spring 2012.

Professional Development (2-credit graduate-level professional development course; OCE6934), Fall 2011.

Surviving Academia (2 credit graduate-level professional development course; OCE6934). Fall 2010.

Marine Molecular Microbiology Laboratory (Undergraduate research course; OCE4930), Fall 2010.

Biological Oceanography (3 credit graduate-level lecture and lab course; OCB6050; REF# 80585). Fall 2009.

Foundations of Biological and Fisheries Oceanography (2 credit graduate-level readings course (OCE6934). Co-instructor with Kendra Daly and Pam Hallock-Muller. Spring 2009.

Biological Oceanography (3 credit graduate-level lecture and lab course; OCB6050; REF# 80674). Co-instructor with David Mann. Fall 2008.

Marine Molecular Methods (3 credit graduate-level lecture and lab course; OCE6934; REF# 12131). Spring 2007.

Metagenomic Bioinformatics (2 credit graduate-level lecture and lab course; OCE6934; REF# 54522). Summer 2007.

Micro-Macro Interactions (1 credit graduate-level readings course; OCE6934; REF# 89230). Fall 2007.

Biological Oceanography (3 credit graduate-level lecture and lab course; OCB6050; REF# 80674). Co-instructor with David Mann. Fall 2007.

Current Graduate Students

Kema Malki – Ph.D. student (Fall 2016 – present)

Natalie Sawaya – Ph.D. student (Fall 2015 – present)

Christina Chadwick – M.S. student (Fall 2019 – present)

Current Postdoctoral Researchers

Erin Symonds – 2017-2021.

Undergraduate Honors Thesis Advisor

Courtney Clark – USF Tampa. 2014.

Marco Padilla-Rodriguez – USF Saint Petersburg. 2012.

Former Graduate Students

Chelsea Bonnain – M.S. student, 2014-2019. M.S. received 2019. Co-advised with Kristen Buck. North FL Area Representative for LABRepCo, LLC.

Natalia Lopez-Figueroa – Ph.D. student, 2017-2020. Transferred to Pam Hallock-Muller's lab in January 2020.

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Erin Symonds – M.S. student, 2006 – 2008 and Ph.D. student 2011-2016. M.S. received 2008, PhD received 2016. Currently a postdoctoral researcher in my lab.

Terry Fei Fan Ng – Ph.D. student, 2006 – 2010. Ph.D. received Fall 2010. Completed a postdoc at the Blood Systems Research Institute in San Francisco and is currently an Investigator at the Center for Disease Control in Atlanta and an Adjunct Assistant Professor at the University of Georgia.

Karyna Rosario – Ph.D. student, 2006 – 2010. Ph.D. received Fall 2010. Currently a Researcher Associated in my laboratory.

Anthony Nitti – M.S. student, 2007 – 2010. M.S. received Fall 2010. Co-advised by David Hollander. Currently employed at NovoBiotic Pharmaceuticals in Massachusetts.

Camille Daniels – Ph.D. student, 2006-2011. Ph.D. received Fall 2011.

Darren Dunlap – M.S. student, 2009 – 2012. M.S. received Spring 2012. Currently a researcher at the United States Geological Survey in Reston, VA.

Sheila O’Dea – M.S. student, 2009 – 2012. M.S. received Summer 2012. Currently a researcher

Dawn Goldsmith – Ph.D. student, 2007-2014. Currently employed at the USGS and as an adjunct professor at Saint Petersburg College.

Max Hopkins – M.S. student, 2011-2014. M.S. received Summer 2014.

Stephanie Lawler- M.S. student, 2013 – 2016. M.S. received Spring 2016. Co-advised by Christina Kellogg (USGS). Currently working at Keep Pinellas Beautiful..

Monica Mion Cook – Ph.D. student, 2007 – 2015. Ph.D. received Spring 2015. Co-advised by

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Dawn Goldsmith. 2015-2016. Currently employed at the USGS and as an adjunct professor at Saint Petersburg College.

Noemi Van Bogaert. 2017-2018. Funded by a grant from the Belgian American Education Foundation.

Undergraduate Students and Interns

Emma Willett – High School Intern (St. Petersburg High School; Summer 2019)

Sophie Goldsmith – High School Intern (Palm Harbor University High School; Summer 2019)

Paige Boleman – Undergraduate (USFSP; Summer 2019)

Shelby Mahank – Undergraduate and Postgraduate Intern (USFSP; Spring 2019-present)

Grace Koziol – Undergraduate (Eckerd College; Summer 2017, 2018, 2019)

Eva-Maria Bonnelycke – Undergraduate (Eckerd College; Summer 2017)

Kaitlin Mettel – Undergraduate (USF Tampa; Summer 2017)

Mason Kerr – Undergraduate (SPC; Summer 2017)

Makenzie Burrows – Undergraduate (USFSP; Fall 2015-Spring 2017)

Melissa Lunan-Simpson – Undergraduate (USFSP; Fall 2016)

Travis Thorn – Undergraduate (USFSP; Fall 2015-2016)

Sidney Fulford – Undergraduate (Eckerd College; Summer 2014-2016)

Anna Walters – St Petersburg High School Intern (Summer 2015-2016)

Lisbet Finseth – Postgraduate Intern (2014-2015)

Christian Marr – Postgraduate Intern (Spring-Summer 2014)

Dylan Kahn – Postgraduate Intern (Spring-Summer 2014)

Carina Graham – Undergraduate (Eckerd College; Summer 2014)

Bethany Levenson – Undergraduate (USF SP; Spring 2013 – Spring 2014)

Jendryx Fernandez – Undergraduate (Hillsborough Community College; Spring 2013)

Marco Padilla-Rodriguez – Undergraduate (USF SP; Spring 2011 – Summer 2013)

Bingjie Xue – Undergraduate (Virginia Commonwealth University; Summer 2011)

Lauren Van Woudenberg - Undergraduate (Eckerd College; Summer 2011)

Allison Cohen – Undergraduate (Columbia University; Summer 2011 and Summer 2012)

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Visiting Scientists

Haris Paliogiannis – MS student from the University of Brussels. Summer 2017.

Inmaculada Garcia Heredia – PhD student from the University Miguel Hernandez, Spain.
Summer 2010.

Sanela Svraka – PhD student from the Netherlands National Institute for Public Health and the Environment. Summer 2009.

Shankar Alavandi – Visiting senior scientist from the Central Institute of Brackishwater Aquaculture in India – Spring 2009.

Student Committees (*indicates major advisor) –

Outside Chair: Brian Badgely (USF Tampa, Biology), Shannon McQuaig (USF Tampa, Biology)

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- Peebles, I am a co-PI. Total amount funded: \$129,265; my portion of the award: \$76,307. 09/01/15 – 08/31/17.
- NASA Grant NNX14AP62A, funded under the National Ocean Partnership Program (NOPP RFP NOAA-NOAA-NOS-IOOS-2014-2003803) in partnership between NOAA, BOEM, and NASA. “National Marine Sanctuaries as Sentinel Sites for a Demonstration Marine Biodiversity Observation Network (MBON)”. 08/01/14-07/31/20. I am a co-PI on a large proposal with Dr. Frank Muller-Karger as lead PI. My funded portion is \$190,987 in Year 1, with anticipated total funding over 5 years of \$912,314.
- National Science Foundation – Integrative Organismal Systems. “Role of phages in structuring bacterial communities: *Ciona intestinalis* as a model system”. Larry Dishaw is lead PI, I am a co-PI. Total award: \$440,300; my portion: \$74,071.
- National Science Foundation: Assembling the Tree of Life: “REU Supplement Request to Collaborative Research: AToL: ACCESS DNA viruses: A Comprehensive survey of Circular Eukaryotic Single-Stranded DNA viruses in Invertebrates and Fungi”. I am the sole PI. Total amount funded: \$6000. 05/01/16 – 04/30/17.
- National Science Foundation – Assembling the Tree of Life. “Collaborative Research: AToL: ACCESS DNA viruses: A Comprehensive survey of Circular Eukaryotic Single-Stranded DNA viruses in Invertebrates and Fungi” 10/15/12 – 10/14/17. \$995,371; co-PI is Karyna Rosario.
- University of South Florida Internal Awards Program – Proposal Enhancement Grant. “Exploring the diversity and ecology of marine single-stranded DNA phages” 11/01/11 – 10/31/12. \$24,913.
- University of South Florida – College of Marine Science Interdisciplinary Research Grant Program. “Development of a Serological Assay for the Detection of Sea Lion Anellovirus (ZcAV)” 6/1/10 – 5/31/12. \$50,000; co-PI with Larry Dishaw.
- National Science Foundation – EAGER. “Discovery of Viruses Infecting Marine Copepoda” 10/01/10 – 09/30/12. \$298,528.
- National Science Foundation – Systematic Biology and Biodiversity Inventories. “Collaborative Research: Vector-enabled discovery: Exploiting whiteflies to investigate the diversity, evolution, and biogeography of begomoviruses” 09/01/10 – 08/31/13. \$322,502.
- Mote Marine Laboratory – Protect Our Reefs Grant. “Spatial Variability in Coral-Associated Bacteria: Implications for Coral Restoration” 05/01/09 – 04/30/10. \$30,827.

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Florida Sea Turtle Grants Program. "Shotgun Sequencing of Viruses Associated with Sea Turtle Fibropapillomatosis". 05/01/08 - 04/30/09. \$29,867.

American Association of University Women - Community Action Grant. "Girl Scouts Marine Science and Technology Workshop". 07/01/08 - 06/31/10. \$5,120.

Florida Institute of Oceanography. 5 days of shiptime to Dry Tortugas, Florida Keys. 5/27/08 – 6/2/08.

National Geographic Society. Impact of human activity on microbes and viruses associated with living stromatolites in Cuatrociénegas, Mexico. 06/01/07 – 06/01/08. \$19,973.

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Zhao, L, K Rosario, **M Breitbart**, S Duffy (2019). Eukaryotic Circular Rep-Encoding Single-Stranded DNA (CRESS DNA) viruses: ubiquitous viruses with small genomes and a diverse host range. *Advances in Virus Research*. 103: 71-133.

Roux, S, EM Adriaenssens, BE Dutilh, EV Koonin, AM Kropinski, M Krupovic, JH Kuhn, R Lavigne, JR Brister, A Varsani, C Amid, RK Aziz, SR Bordenstein, P Bork, **M Breitbart**, GR Cochrane, RA Daly, C Desnues, MB Duhaim, JB Emerson, F Enault, JA Fuhrman, P Hingamp, P Hugenholtz, BL Hurwitz, NN Ivanova, JM Labonte, RR Malmstrom, M Martinez-Garcia, I Mizrachi, H Ogata, D Paez-Espino, M-A Petit, C Putonti, T Rattei, A Reyes, F Rodriguez-Valera, K Rosario, L Schrim, F Schulz, GF Steward, MB Sullivan, S Sunagawa, CA Suttle, B Temperton, SG Tringe, R Vega Thurber, NS Webster, KL Whiteson, SW Wilhelm, KE Wommack, T Woyke, K Wrighton, P Yilmaz, T Yoshida, MJ Young, N . 71 ()d1 (4 (i)-2 sa)-2 (r)-2 (a)-1 (nde)-1 (d D) ()5 .85 (E

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Leigh, BA, C Karrer, JP Cannon, **M Breitbart**, LJ Dishaw (2017). Isolation and characterization of a *Shewanella* phage–host system from the gut of the tunicate, *Ciona intestinalis*. *Viruses*. 9: 60.

Rosario, K, **M Breitbart**, B Harrach, J Segales, E Delwart, P Biagini, A Varsani (2017). Revisiting the taxonomy of the family *Circoviridae*: Establishment of the genus *Cyclovirus* and removal of the genus *Gyrovirus*. *Archives of Virology*. 162: 1447-1463.

Symonds, EM, S Young, ME Verbyla, SM McQuaig-Ulrich, E Ross, JA Jimenez, VJ Harwood, **M Breitbart** (2017). Microbial source tracking in shellfish harvesting waters in the Gulf of Nicoya, Costa Rica. *Water Research*. 111: 177-184.

Simmonds, P, **M Breitbart**, JR Brister, EB Carstens, E Delwart, R Hull, EV Koonin, MJ Roossinck, MB Sullivan, CA Suttle, RB Tesh, M Benko, RA van der Vlugt, MJ Adams, AJ Davison, AE Gorbalenya, B Harrach, AMQ King, M Krupovic, JH Kuhn, EJ Lefkowitz, M Nibert, R Orton, S Sabanadzovic, A Varsani, FM Zerbini (2017). *Virus* Va. 61EMC BT/F

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Rosario, K, YM Seah, C Marr,.02 Marr

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Symonds, EM, ME Verbyla, JO Lukasik, RC Kafle, **M Breitbart**, JR Mihelcic (2014). A case study of enteric virus removal and insights into the

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- Rosario, K, M Padilla-Rodriguez, S Kraberger, D Stainton, DP Martin, **M Breitbart**, A Varsani (2013). Discovery of a novel mastrevirus and alphasatellite-like circular DNA in dragonflies (Ephemeroptera) from Puerto Rico. *Virus Research*. 171: 231-237.
- Rosario, K, A Dayaram, M Marinov, J Ware, S Kraberger, D Stainton, **M Breitbart**, A Varsani (2012). Diverse circular single-stranded DNA viruses discovered in dragonflies (Odonata: Ephemeroptera). *Journal of General Virology*. 93: 2668-2681.
- Rosario, K, S Duffy, **M Breitbart** (2012). A field guide to eukaryotic circular single-stranded DNA viruses: Insights gained from metagenomics. *Archives of Virology*. 157: 1851-1871.
- Nitti, A, C Daniels, J Siefert, V Souza, D Hollander, **M Breitbart** (2012). Spatially resolved genomic, stable isotopic, and lipid analyses of a modern freshwater microbialite from Cuatro Ciénegas, Mexico. *Astrobiology*. 12: 685-698.
- Daniels, C and **M Breitbart** (2012). Bacterial communities associated with the ctenophores *Mnemiopsis leidyi* and *Beroë ovata*. *FEMS Microbiology Ecology*. 82: 90-101.
- Dwivedi, B, R Schmieder, DB Goldsmith, RA Edwards, **M Breitbart** (2012). PhiSiGns: an online tool to identify signature genes in phages and design PCR primers for examining phage diversity. *BMC Bioinformatics*. 13: 37.
- Breitbart, M** (2012). Marine viruses: truth or dare. *Annual Review of Marine Science*. 4: 425-448.
- Parsons, RJ, **M Breitbart**, MW Lomas, CA Carlson (2012). Ocean time-series reveals recurring seasonal patterns of virioplankton dynamics in the northwestern Sargasso Sea. *ISME Journal*, 6: 273-284.
- Goldsmith, DB, G Crosti, B Dwivedi, LD McDaniel, A Varsani, CA Suttle, MG Weinbauer, RA Sandaa, **M Breitbart** (2011). Development of *phoH* as a novel signature gene for assessing

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- samples and its detection in samples from multiple years. *Journal of General Virology*. 92: 1318-1323.
- Daniels, CA, A Zeifman, K Heym, KB Ritchie, CA Watson, I Berzins, M Breitbart (2011). Spatial heterogeneity in bacterial communities in the mucus of *Montastraea annularis*. *Marine Ecology Progress Series*. 426: 29-40.
- Sime-Ngando, T, S Lucas, A Robin, KP Tucker, J Colombet, Y Bettarel, E Desmond, S Gribaldo, P Forterre, M Breitbart, D Prangishvili (2011). Diversity of virus-host systems in hypersaline Lake Retba, Senegal. *Environmental Microbiology*. 13: 1956-1972.
- Tucker, KP, R Parsons, EM Symonds, M Breitbart (2011). Diversity of single-stranded DNA phages in the North Atlantic Ocean. *The ISME Journal*. 5: 822-830.
- Sharon, I, N Battchikova, E-M Aro, C Giglione, T Meinel, F Glaser, RY Pinter, M Breitbart, F Rohwer, O Beja (2011). Comparative metagenomics of microbial traits within oceanic viral communities. *The ISME Journal*. 5: 1178-1190.
- Svraka, S, K Rosario, E Duizer, H van der Avoort, M Breitbart, M Koopmans (2010). Metagenomic sequencing for virus identification in a public health setting. *Journal of General Virology*. 91: 2846-2856.
- Aziz, RK, M Breitbart, RA Edwards (2010). Transposases are the most abundant, most ubiquitous genes in nature. *Nucleic Acids Research*. 38: 4207-4217.
- Rodriguez-Brito, B, L Li, L Wegley, M Furlan, F Angly, M Breitbart, J/y.caa0, C421u2 76/TT3 (42 (, S)1 0.02
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Ng, TFF, C Manire, K Borrowman, T Langer, L Ehrhart, **M Breitbart** (2009). Discovery of a novel single-stranded DNA virus from a sea turtle fibropapilloma by using viral metagenomics. *Journal of Virology*. 83: 2500-2509.

Symonds, EM, DW Griffin, **M Breitbart** (2009). Eukaryotic viruses in wastewater samples from the United States. *Applied and Environmental Microbiology*. 75: 1402-1409.

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- Suttle, F Rohwer (2006). The marine viromes of four oceanic regions. *PLoS Biology*. 4:e368.
- Casas, V, J Miyake, H Balsley, J Roark, S Telles, S Leeds, I Zurita, **M Breitbart**, D Bartlett, F Azam, F Rohwer (2006) Widespread occurrence of phage-encoded exotoxin genes in terrestrial and aquatic environments in Southern California. *FEMS Microbiology Letters*. 261: 141-149.
- Edwards, RA, B Rodriguez-Brito, L Wegley, M Haynes, **M Breitbart**, DM Peterson, MO Saar, S Alexander, EC Alexander Jr., F Rohwer (2006) Using pyrosequencing to shed light on deep mine microbial ecology under extreme hydrogeologic conditions. *BMC Genomics*. 7: 57.
- Zhang, T, **M Breitbart**, WH Lee, J-Q Run, CL Wei, SWL Soh, ML Hibberd, E Liu, F Rohwer, Y Ruan (2006) RNA viral community in human feces: Prevalence of plant pathogenic viruses. *PLoS Biology*. 4: e3.
- Yu, Y, **M Breitbart**, P McNairnie, F Rohwer (2006) FastGroupII: A web-based bioinformatics platform for analyses of large 16S rDNA libraries. *BMC Bioinformatics*. 7:57.
- Kline, D, NM Kuntz, **M Breitbart**, N Knowlton, F Rohwer (2006) Role of elevated organic carbon levels and microbial activity in coral mortality. *Marine Ecology Progress Series*. 314: 119-125.
- Breitbart, M**, and F Rohwer (2005) Method for discovering novel DNA viruses in blood using viral particle selection and shotgun sequencing. *Biotechniques*. 39: 729-736.
- Breitbart, M**, and F Rohwer (2005) Here a W.
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Wegley, L, Y Yu, **M Breitbart**, V Casas, D Kline, F Rohwer (2004) Coral-associated *Archaea*.
Marine Ecology Progress Series. 273: 89-96.

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- Malki, K., M. Martin, B. Fane, **M. Breitbart**. “Characterization of *Bdellovibrio bacteriovorus* phage”. Poster presentation by K. Malki. 22nd Biennial Evergreen International Phage Meeting. Olympia, WA. 8/17.
- Leigh, B.A., Z. Graham, A. Liberti, **M. Breitbart**, L.J. Dishaw. “Unraveling a role for prophages in shaping gut microbiomes”. Oral presentation by B. Leigh. 22nd Biennial Evergreen International Phage Meeting. Olympia, WA. 8/17.
- Bonnain, C., S. Caprara, K.N. Buck, **M. Breitbart**. “Testing the ferrojan horse hypothesis: Iron-virus interactions in the oceans”. Oral presentation by C. Bonnain. 22nd Biennial Evergreen International Phage Meeting. Olympia, WA. 8/17.
- Leigh, B.A., Z. Graham, A. Liberti, J.P. Cannon, **M. Breitbart**, L.J. Dishaw. “*Ciona intestinalis*: a model system for dissecting the roles of prophages in modulating host-associated microbial communities”. Animal-Microbe Symbiosis Gordon Research Conference. West Dover, VT. 6/17.
- Symonds, E.M., S. Young, M.E. Verbyla, S.M. McQuaig-Ulrich, E. Ross, J.A. Jimenez, V.J. Harwood, and **M. Breitbart**. “Fecal Pollution and Microbial Source Tracking in Shellfish Harvesting Waters in the Gulf of Nicoya, Costa Rica”. Oral presentation by E. Symonds. Water Microbiology Conference, Chapel Hill, NC.
- Breitbart, M.** “Virus hunting in the age of metagenomics”. Invited plenary speaker, University of Tampa Undergraduate Research Symposium. Tampa, FL. 4/17.
- Breitbart, M.** “Small but significant: single-stranded DNA viruses in the environment”. Oral presentation. Ninth workshop on Virus Evolution. State College, PA. 3/17.
- Rosario, K. and **Breitbart, M.** “Exploring the diversity of circular single-stranded DNA viruses in insects”. Oral presentation by K. Rosario. Ninth workshop on Virus Evolution. State College, PA. 3/17.
- Djurhuus, A., B. Leigh, M. Kavanaugh, **M. Breitbart**. “Seascape-informed analysis of viral communities on the west Florida shelf” Poster presentation by A. Djurhuus. ASLO Ocean Sciences Meeting. Honolulu, HI. 2/17.
- Sosnowski, A., **M. Breitbart**, H. Judkins, M. Vecchione. “Genetic identification and population characteristics of deep-sea cephalopod species in the Gulf of Mexico and northwestern Atlantic Ocean. Poster presentation by A. Sosnowski. GOMOSES Conference. New Orleans, LA. 2/17.
- Burrows, M., E. Fahsbender, **M. Breitbart**. “Genomic variation of the chelonid fibropapillomatosis-associated herpesvirus”. Oral presentation by M. Burrows. Florida Branch Meeting of the American Society for Microbiology Meeting. Miami, FL. 10/16.
- Fahsbender, E., K. Rosario, **M. Breitbart**. “The use of vector-enabled metagenomics (VEM) for surveillance of animal and plant viruses”. Oral presentation by E. Fahsbender. Florida Branch Meeting of the American Society for Microbiology Meeting. Miami, FL. 10/16.
- Leigh, B., Z. Graham, A. Creasy, A. Liberti, J. P. Cannon, G. W. Litman, **M. Breitbart**, and L. J. Dishaw. Exploring phage roles in the gut of a marine protochordate, *Ciona intestinalis*. Oral presentation by B. Leigh. American Society of Microbiology Conference on Beneficial Microbes. Seattle, WA. 9/16.
- Creasy, A. B. Leigh, A. Liberti, Z. Graham, J. Cannon, G. Litman, **M. Breitba**

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presentation by A. Creasy. American Society of Microbiology Conference on Beneficial Microbes. Seattle, WA. 9/16.

Verbyla, M.E. E.M. Symonds, R.C. Kafle, M.R. Cairns, M. Iriarte, A. Mercado, O. Coronado, **M. Breitbart**, C. Ledo, and J.R. Mihelcic. Managing microbial risks from indirect wastewater reuse for irrigation using riverbank filtration. Oral presentation by E. Symonds. Aerobic Spores and Other Microbial Indicators to Determine Ground Water

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Symonds, E.M. C. Sinigalliano, M. Gidley, W. Ahmed, S.M. McQuaig-Ulrich, **M. Breitbart.**

Performance of a pepper mild mottle virus RT-qPCR method in coastal waters exposed to untreated wastewater pollution and its simulated risk of gastrointestinal illness. Poster