

N I C L A S E N G E N E

Department of Biological Sciences
Florida International University
Miami FL 33199

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EDUCATION

- 2011 Ph.D., Oceanography with emphasis in Marine Biology
Scripps Institution of Oceanography - University of California,
San Diego (UCSD)
- 2005 B.Sc. and M.Sc., Chemistry, with major emphasis in Natural Products
Chemistry and minor emphasis in Pharmaceutical Bioscience
University of Gothenburg, Sweden
- 2005 B.Sc. and M.Sc., Marine Biology with emphasis in Marine Microbiology
University of Gothenburg, Sweden

RESEARCH INTERESTS

Multidisciplinary research focused on elucidating the link between biological and chemical diversity of marine cyanobacteria; secondary metabolism in marine microorganisms with emphases on chemical ecology, natural products discovery, and chemotaxonomy; utilization of molecular-phylogenetic methods for directing and enhancing natural product discovery programs; molecular systematics, evolution, ecology, biogeography, and taxonomy of tropical marine cyanobacteria.

RESEARCH EXPERIENCE

- 2014-Present Assistant Professor: Department of Biological Sciences, Florida International University
- 2013-2014 Postdoctoral Researcher: Department of Botany, National Museum of Natural History, Smithsonian Institution. Advisor: Valerie Paul
- 2011-2013 Postdoctoral Researcher: Smithsonian Marine Station at Ft. Pierce, Smithsonian Institution. Advisor: Valerie Paul
- 2006-2011 Graduate Researcher/Ph.D. Candidate: Scripps Institution of Oceanography, UCSD. Advisor: William Gerwick
- 2005-2006 Staff Research Associate II: Scripps Institution of Oceanography, UCSD Advisor: William Gerwick
- 2005 Graduate Researcher (M.Sc.): Scripps Institution of Oceanography, UCSD Advisor: William Fenical
- 2005 Graduate Researcher (M.Sc.): Marine Science Institute, University of the Philippines. Advisor: Giselle Concepcion
- 2004 Undergraduate Researcher: Institute of Molecular Bioscience, University of Queensland. Advisor: Richard Lewis

PUBLICATIONS

2013

Engene, N.; Byrum, T.; Thor, A.; Ellisman, M. H.; Gerwick, W. H.; Paul, V. J. (2013). Five Chemically Rich Species of Tropical Marine Cyanobacteria of the Genus *Okeania* gen. nov. (Oscillatoriales, Cyanobacteria). *J. Phycol.* 49: 1095-1106.

Pavlik, C. M.; Wong, C. Y. B.; Ononye, S.; Lopez, D. D.; **Engene, N.**; McPhail, K. L.; Gerwick, W. H.; Balunas, M. J. Santacruzamate A, a Potent and Isozyme Selective Histone Deacetylase (HDAC) Inhibitor from the Panamanian Marine Cyanobacterium cf. *Symploca* sp. *J. Nat. Prod.* 76: 2026-2033.

Engene, N.; Gunasekera, S. P.; Gerwick, W. H.; Paul, V. J. (2013). Phylogenetic Inferences Reveal Large Extent of Novel Biodiversity in Chemically Rich Tropical Marine Cyanobacteria. *Appl. Env. Microbiol.* 79: 1882-1888.

2012

Balunas, M. J.; Grosso, M. F.; Villa, F. V.; **Engene, N.**; McPhail, K. L.; Tidgewell, K.; Pineda, L. M.; Gerwick, L.; Spadafora, C., Kyle, D. E.; Gerwick, W. H. (2012). Coibacins A-D, New Anti-leishmanial Polyketides with Intriguing Biosynthetic Origins. *Org. Lett.* 14: 3878-3881.

Nunnery, J. K.; **Engene, N.**; Byrum, T.; Cao, Z.; Sairam, J.; Pereira, A.; Teatulohi, M.; Murray, T. F.; Gerwick, W. H. (2012). Biosynthetically-Intriguing Chlorinated Lipophilic Metabolites from Geographically Distant Tropical Marine Cyanobacteria. *J. Nat. Prod.* 77: 4198-4208.

Engene, N.; Rottacker, E. C.; Choi, H.; Byrum, T.; Kaštovský, J. H.; Komárek, J.; Ellisman, M. H.; Gerwick W. H. (2012). *Moorea producta* gen. nov., sp. nov. and *Moorea bouillonii* comb. nov., tropical marine cyanobacteria rich in bioactive secondary metabolites. *Int. J. Syst. Evol. Microbiol.* 62: 1172-1179.

Leão, P. N.; **Engene, N.**, Antunes, A.; Gerwick, W. H.; Vasconcelos, V. M. (2012). The chemical ecology of cyanobacteria. *Nat. Prod. Rep.* 29: 372-391.

Malloy, K. L.; Suyama, T. L.; **Engene, N.**; Debonsi, H.; Cao, Z.; Matainaho, T.; Murray, T. F.; Gerwick, W. H. (2012). Credneramides A and B: Neuromodulatory Phenethylamine and Isopentylamine Derivatives of a Vinyl chloride-containing Fatty Acid from a Papua New Guinea Collection of *Lyngbya* sp. *J. Nat. Prod.* 75: 60-66.

2011

Engene, N.; Choi, H.; Esquenazi, E.; Byrum, T.; Villa, F.; Murray, T.; Dorrestein, P. C.; Gerwick, L. G.; Gerwick, W. H. (2011). Phylogeny-Guided Isolation of Ethyl Tumonoate A from the Marine Cyanobacterium *Oscillatoria margaritifera*. *J. Nat. Prod.* 74: 1737-43.

Mevers, E.; Liu, W-T.; **Engene, N.**; Byrum, T.; Dorrestein, P. C.; Gerwick, W. H. (2011). Cytotoxic Veraguamides, Alkynyl Bromide Containing Cyclic Depsipeptides from an Unusual Marine Cyanobacterium cf. *Oscillatoria margaritifera*. *J. Nat. Prod.* 74: 928-936.

Engene, N.; Choi, H.; Esquenazi, E.; Rottacker, E. C.; Ellisman, M. H.; Dorrestein, P. C.; Gerwick, W. H. (2011). Underestimated Biodiversity as a Major Explanation for the Perceived Prolific Secondary Metabolite Capacity of the Cyanobacterial Genus *Lyngbya*. *Environ. Microbiol.* 13: 1601-1610.

Pereira, A. R.; Etzbach, L.; **Engene, N.**; Müller, R.; Gerwick, W. H. (2011). Unusual Molluscicidal Chemotypes from a new Palmyra Atoll Cyanobacterium. *J. Nat. Prod.* 74: 1175-1181.

Engene, N.; Gerwick W. H. (2011). Intra-genomic 16S rRNA Gene Heterogeneity in Cyanobacterial Genomes. *Fottea* 11: 17-24.

Malloy, K. L.; Villa, F.; **Engene, N.**; Matainaho, T.; Gerwick, L. G.; Gerwick, W. H. (2011). Malyngamide 2, a Bioactive Metabolite from the Papua New Guinea Marine Cyanobacterium *Lyngbya sordida*. *J. Nat. Prod.* 74: 95-98.

Gutierrez, M.; Tidgewell, K.; Capson, T.; **Engene, N.**; Almanza, A.; Manfred, J.; Jarg, S.; Gerwick, W. H. (2011). Malyngolide Dimer, a Bioactive Symmetric Cyclodepside from the Panamanian Marine Cyanobacterium *Lyngbya majuscula*. *J. Nat. Prod.* 73: 709-711.

2010

Engene, N.; Coates, R. C.; Gerwick W. H. (2010). 16S rRNA Gene Heterogeneity in the Filamentous Marine Cyanobacterial Genus *Lyngbya*. *J. Phycol.* 46: 591-601.

Pereira, A. R.; Cao, Z.; **Engene, N.**; Soria-Mercado, I. E.; Murray, T. F.; Gerwick, W. H. (2010). Palmyrolide A, a New Neuroactive Macrolide from a consortium of two Palmyra Atoll Cyanobacteria. *Org. Lett.* 12: 4490-4493.

Choi, H.; **Engene, N.**; Smith, J. E.; Preskitt, L. B.; Gerwick, W. H. (2010). Crossbyanols A-D, Toxic Brominated Polyphenyl Ethers from the Hawaiian Bloom-forming Cyanobacterium *Leptolyngbya crossbyana*. *J. Nat. Prod.* 73: 517-522.

Tidgewell, K.; **Engene, N.**; Byrum, T.; Valeriote, F. A.; Gerwick, W. H. (2010). Diversification of a Modular Natural Product Pathway: Production of Apratoxins F and G, Two Cytotoxic Cyclic Depsipeptides from a Palmyra Collection of *Lyngbya bouillonii*. *ChemMedChem.* 11: 1-11.

Choi, H.; Pereira, A. R.; Cao, Z.; Shuman, C. F.; **Engene, N.**; Byrum, T.; Matainaho, T.; Murray, T. F.; Mangoni, A.; Gerwick, W. H. (2010). The Hoiamides, Structurally-Intriguing Neurotoxic Lipopeptides from Papua New Guinea Marine Cyanobacteria. *J. Nat. Prod.* 73: 1411-1421.

Taniguchi, M.; Nunnery, J.; **Engene, N.**; Esquenazi, E.; Byrum, T.; Dorrestein, P.C.; Gerwick, W.H. (2010). Palmyramide A, a Cyclic Depsipeptide from a Palmyra Atoll

Collection of the Marine Cyanobacterium *Lyngbya majuscula*. *J. Nat. Prod.* 73: 393-398.

Before 2010

Clark, B. R.; **Engene, N.**; Teasdale, M. E.; Rowley, D. C.; Matainaho, T.; Valeriote, F. A.; Gerwick, W. H. (2008). Natural Products Chemistry and Taxonomy of the Marine Cyanobacterium *Blennothrix cantharidiosmum*. *J. Nat. Prod.* 71: 1530-1537.

Simmons, T. L.; **Engene, N.**; Urena, L.; Romero, L. I.; Ortega-Barria, E.; Gerwick, L.; Gerwick, W. H. (2008). Viridamides A and B, Lipodepsipeptides with Antiprotozoal Activity from the Marine Cyanobacterium *Oscillatoria nigro-viridis*. *J. Nat. Prod.* 71: 1544-1550.

Gutierrez, M.; Suyama, T.; **Engene, N.**; Wingerd, J.; Matainaho, T.; Gerwick, W. H. (2008). Apratoxin D, a Potent Cytotoxic Cyclodepsipeptide from Papua New Guinea Collections of the Marine Cyanobacteria *Lyngbya majuscula* and *Lyngbya sordida*. *J. Nat. Prod.* 71: 1099-1103.

Gerwick, W. H.; Coates, R. C.; **Engene, N.**; Gerwick, L. G.; Grindberg, R.; Jones, A.; Sorrels, C. (2008). Giant marine cyanobacteria produce exciting potential pharmaceuticals. *Microbe*. 3: 277-284.

Gerwick, W. H.; Byrum, T.; Carland, T.; R. Coates, C.; **Engene, N.**; Esquenazi, E.; Gerwick, L.; Grindberg, R.; Johnson, M.; Jones, A.; Malloy, K.; Nunnery, J.; Pereira, A.; Soria, I.; Sorrels, C.; Taniguchi, M.; Tidgewell, K.; Villa, F.; Vining, O.; Dorrestein, P.; Gu, L.; Sherman, D. H. (2008). Integrating Chemical and Biochemical Approaches to Natural Products Drug Discovery from Marine Cyanobacteria, Proceedings from the New Developments in Drug Discovery on Natural Products and Traditional Medicines. NIPER, India, 33-43.

Simmons, T. L.; Coates, R. C.; Clark, B. R.; **Engene, N.**; Gonzalez, D.; Esquenazi, E.; Dorrestein, P. C.; Gerwick, W. H. (2007). Biosynthetic origin of natural products isolated from marine microorganism-invertebrate assemblages. *PNAS*. 105: 4587-4594.

AWARDS, HONORS AND GRANTS

Smithsonian Institution, Small Grant Award (co-PI). Project title: “Biodiversity and Genomic Studies of Benthic Marine Cyanobacteria from Puerto Rico”, \$4880 (2014)

NSF travel award to participate in the University of Texas at Austin “Symposium and Workshop on New Methods for Phylogenomics and Metagenomics”, \$500 (2012)

Smithsonian Marine Science Network Postdoctoral Fellowship. Project title: “Taxonomic, Spatial and Temporal Distribution of Bioactive Secondary Metabolites in Tropical Marine Cyanobacteria”, \$110,000 (2011-2013)

Phycological Society of America (PSA) Grants-In-Aid. Project title: “Taxonomy of Tropical Marine Natural Products-producing Cyanobacteria of Panama”, \$1,000 (2011)

Paul Silva Student Grant, International Phycological Society. Project title: “Revision of the

Genus *Lyngbya* and Description of *Moorea* gen. nov. (Cyanobacteria), a Tropical Marine Cyanobacterial Genus Prolific in Bioactive Secondary Metabolites”, \$1,000 (2010)

Lynn Brady Travel Award – for presentation at the American Society of Pharmacognosy annual meeting. Title: “Synergizing Cyanobacterial Phylogenetics with Natural Products Drug Discovery”, \$500 (2010)

ZoBell Award – for significant contribution to the field of microbiology at the Scripps Institution of Oceanography, \$2,000 (2009-2010)

Edna Bailey Sussman Fellowship. Project title: “Molecular-genetic techniques for improvement of algae cultivation in generating biofuel”, \$8,000 (2009)

Halliday Student Field Research Award. Project title: “Secondary Metabolite Diversity from Cyanobacteria of the Caribbean Island of Curacao”, \$3,000 (2008)

Swedish-American Foundation and Wallenbergska Foundation. Project title: “Natural Products Discoveries from Tropical Marine Cyanobacteria”, \$35,000 (2006)

Willinska Foundation. Project title: “Isolation and Identification of Bioactive Secondary Metabolites Produced by the Marine Bacterium *Pelagibacter variabilis*”, \$5,000 (2005)

Exchange student scholarship (University of Queensland, Australia), \$30,000 (2004)

Adelbertska Foundation. Undergraduate research support, \$1,000 (2003)

SCIENTIFIC MEETINGS

Southeastern Microbiology Summit □ Joint meeting of Southeastern and Florida□ Branches of American Society for Microbiology, Ponte Vedra beach, FL, Sept 2014 – Marine Microbiology [Session chair]

Marine Natural Products, Gordon Research Conferences, Ventura, CA, March 2014 – “Understanding Biodiversity for Targeted Natural Product Discoveries in Marine Cyanobacteria” [Poster]

Indian River Lagoon Symposium (IRLS), FAU, Harbor Branch, FL, Feb 2014 – “Taxonomic Descriptions of Novel Cyanobacteria with Ecological and Biomedical Relevance in the Indian River Lagoon” [Speaker]

North Florida Marine Science Symposium, Whitney Laboratory for Marine Bioscience, FL, Jan 2014 – “Understanding Biodiversity for Targeted Natural Product Discoveries in Marine Cyanobacteria” [Speaker]

7th US HAB Symposium, Sarasota, FL, Oct 2013 – “Taxonomic Descriptions of Novel Cyanobacterial Biodiversity for Monitoring, Surveying, and Controlling Cyanobacterial Harmful Algal Blooms (cyanoHABs)” [Speaker]

35th Southeastern Phycological Colloquy (SEPC), Dauphin Island Sea Lab, AL, Sept 2013 – “*Hyalidium penicilliformis* gen. nov., sp. comb. nov. (Oscillatoriales), a pantropical marine cyanobacterium with biomedical relevance” [Speaker]

10th International Phycological Congress, Orlando, Florida, Aug 2013 – “Identification of Novel Cyanobacterial Biodiversity for Monitoring, Surveying, and Controlling Cyanobacterial Harmful Algal Blooms (cyanoHABs) in Southern Florida” [Speaker]

19th Symposium of the International Association for Cyanophyte Research, Cleveland, Ohio, July 2013 – “Five Chemically Rich Species of Tropical Marine Cyanobacteria of the Genus *Tropicimarinus* gen. nov. (Oscillatoriales, Cyanobacteria)” [Speaker]

Center of Excellence in Biomedical and Marine Biotechnology Symposium, Florida Atlantic University, April 2013 – “Recognition of Novel Cyanobacterial Biodiversity for Targeted Natural Product Discoveries” [Speaker]

ASLO 2013 Aquatic Sciences Meeting, New Orleans, Feb 2013 – “Understanding the Ecology and Phylogeny of Bloom Forming Cyanobacteria in the Indian River Lagoon, Florida” [Poster]

Indian River Lagoon Symposium (IRLS), Harbor Branch Oceanographic Institution, FL, Feb 2013 – “Recognition of Novel Cyanobacterial Biodiversity for Monitoring and Predictions of Harmful Cyanobacterial Blooms in the Indian River Lagoon, FL” [Speaker]

University of Florida Marine Biology Symposium (UFMBS), the Whitney Laboratory, FL, Jan 2013 – “Recognition of Novel Cyanobacterial Biodiversity for Monitoring and Predictions of Harmful Cyanobacterial Blooms in Southern Florida” [Speaker]

34th Southeastern Phycological Colloquy (SEPC), Jacksonville, FL, Oct 2012 – “*Tropicimarinus vallis* gen. nov., sp. nov., *T. pulvinus* sp. nov., *T. epiphytica* sp. nov., *T. erythroflocus* sp. nov., *T. flagellum* sp. nov., five new marine natural products-rich species of cyanobacteria” [Speaker]

Phycological Society of America Annual Meeting, Charleston, South Carolina, June 2012 – “Taxonomic Revisions of Marine Cyanobacteria to Facilitate Natural Products Discoveries and Harmful Algae Bloom Monitoring” [Speaker]

33rd Southeastern Phycological Colloquy (SEPC), Miami, FL, Oct 2011 – “Novel Biodiversity of Natural Products-producing Tropical Marine Cyanobacteria” [Poster]

52st Annual Meeting of the American Society of Pharmacognosy (ASP), San Diego, CA, July, 2011 – “Underestimated Biodiversity: a Rationale for the Skewed Perception of Natural Products in Marine Cyanobacteria” [Poster]

International Cooperative Biodiversity Groups (ICBG) Panama Program - Annual Meeting 2011, Panama City, Panama, May 2011 – “Making Sense of the Chaos of Cyanobacterial Taxonomy – a Multidisciplinary Approach” [Speaker]

International Cooperative Biodiversity Groups (ICBG) Panama Program - Annual Meeting 2011, Panama City, Panama, May 2011 – “Novel Natural Product-producing Cyanobacteria from Panama” [Poster]

18th Symposium of the International Association for Cyanophyte Research (IAC), České Budějovice, Czech Republic, August 2010 – “Revision of the Genus *Lyngbya* and Description of *Moorea* gen. nov. (Cyanobacteria), a Tropical Marine Cyanobacterial Genus Prolific in Bioactive Secondary Metabolites” [Speaker and Poster]

51st Annual Meeting of the American Society of Pharmacognosy (ASP) and the Phytochemical Society of North America, St. Petersburg, FL, July, 2010 – “Synergizing Cyanobacterial Phylogenetics with Natural Products Drug Discovery” [Poster]

10th Cyanobacterial Molecular Biology Workshop, Lake Arrowhead, CA, June 2010 – “Underestimated Biodiversity as a Major Explanation for the Perceived Prolific Secondary Metabolite Capacity of the Cyanobacterial Genus *Lyngbya*” [Poster]

25th Philippine-American Academy of Science and Engineering Meeting & Symposium (PAASE), Cebu, Philippines, Feb, 2005 – “Isolation and Identification of Bioactive Secondary Metabolites Produced by the Marine Bacterium *Pelagibacter variabilis*” [Poster]

TEACHING EXPERIENCE

Mentor in Centers for Ocean Sciences Education Excellence (COSEE) Research Experience for Pre-Service Teachers (Indian River State College) 2012, 2014
[\(http://www.cbs12.com/news/top-stories/stories/vid_17035.shtml\)](http://www.cbs12.com/news/top-stories/stories/vid_17035.shtml)

Invited Instructor (University of Illinois at Chicago) 2009 and 2010. Molecular Evolution and Phylogenetics.

Teaching Assistant (University of California San Diego) 2008. Course: Recombinant DNA Techniques (BIMM 101)

Mentored and trained undergraduate students and graduate students from Indian River State College at Ft. Pierce (2011-2014), University of California at San Diego (2010-2011), and University of Gothenburg Sweden (2010)

SEMINARS AND EDUCATIONAL OUTREACH

Seminar, University of North Florida, FL, April 2014 – “Connecting the Pieces: Understanding Marine Cyanobacteria by Integrating Phylogeny, Chemistry and Ecology” [Invited Speaker]

Seminar, Florida International University, FL, Feb 2014 – “Connecting the Pieces: Understanding Marine Cyanobacteria by Integrating Phylogeny, Chemistry and Ecology” [Invited Speaker]

Smithsonian Science Seminar, Fort Pierce, FL, Jan 2014 – “The Good, the Bad, and the

Ugly: Novel Marine Cyanobacteria in Southern Florida with Ecological and Biomedical Relevance” [Invited Speaker]

Marine Science Seminar, Florida International University, FL, Nov 2014 – “The Good, the Bad, and the Ugly: Novel Marine Cyanobacteria in Southern Florida with Ecological and Biomedical Relevance” [Invited Speaker]

The Wildlife Foundation of Florida (WFF) Blue Green Event, FL, Nov 2013 – “Understanding the Ecology and Phylogeny of Bloom Forming Cyanobacteria in the Indian River Lagoon, Florida” [Poster]

Ocean Science Lecture, Harbor Branch Oceanographic Institution, FL, Aug 2013 – “What’s My Name, Again? How Better Taxonomy Can Aid in Understanding Harmful Algal Blooms” [Invited Speaker] - <http://www.youtube.com/watch?v=IDNAo8PnvkQ>

Saint Edward's School Science Speaker Series, Vero Beach, FL, April 2013 – “The Good, the Bad, and the Ugly: Cyanobacteria in the Indian River Lagoon” [Invited Speaker]

Smithsonian Science Seminar, Fort Pierce, FL, Nov 2011 – “Natural Products from Marine Cyanobacteria” [Invited Speaker]

SCIENTIFIC REVIEWER

Journals: Journal of Marine Biology; Journal of Phycology; Journal of Natural Products; Harmful Algae; Marine Environmental Research; Asian Pacific Journal of Tropical Biomedicine; Marine Drugs; African Journal of Microbiology Research; Journal of Applied Phycology; Oceanography; Scientific Reports; Evolutionary Bioinformatics

Books: Elsevier Science Publishers - Amsterdam

Funding Agencies: Portuguese Foundation for Science and Technology; Czech Science Foundation; Louisiana Board of Regents

Miscellaneous: International Phycological Congress, Papenfuss award; Ocean 180 Video Challenge, COSEE Florida

RESEARCH EXPEDITIONS

Dry Tortuga Natural park, Florida Keys: May 2013; Miskito coast, Honduras: May 2013; Belize, Carrie Bow Cay: Aug. 2012, Sept. 2011; Florida Keys: 2011-2014; Netherlands Antilles, Bonaire: Oct. 2011; Netherlands Antilles, Curacao: Dec. 2008, Oct. 2011; Panama, Bocas del Toro: Sept. 2010, May 2011; Panama, Coiba National Park: May 2011; Panama, Portobello: Sept. 2010, Papua New Guinea, Milne Bay: Apr. 2005; Japan, Okinawa: March 2005.

PROFESSIONAL DEVELOPMENT

Symposium and Workshop on New Methods for Phylogenomics and Metagenomics, University of Texas at Austin – 2013; Florida COSEE Broadening the Impact of Science: Strategies Underlying Success (BIS:SUS) – 2011; Workshop on Comparative Genomics, Smithsonian Institution, Washington D. C. – 2011; Workshop on Molecular Evolution, Czech Republic – 2010; Determination course of cyanobacteria, Czech Republic -2009

PROFESSIONAL ORGANIZATIONS AND AFFILIATIONS

American Association for the Advancement of Science (AAAS), American Chemical Society (ACS), Phycological Society of America (PSA), International Phycological Society (IPS), American Society for Microbiology (ASM)

REFERENCES

Dr. Valerie J. Paul
Head Scientist – Smithsonian Marine Station
772- 462-0982
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Dr. William H. Gerwick
Distinguished Professor - Center for Marine Biotechnology and Biomedicine, Scripps Institution of Oceanography, University of California San Diego
858-534-0578
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Dr. William Fenical
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Dr. Paul R. Jensen
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