

**ALAN W. DECHO, B.S., M.S., Ph.D.**

*Professor,*

Department of Environmental Health Sciences;

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**ACADEMIC TRAINING:**

- 1989-93      *National Research Council (NRC) Postdoctoral Fellow.* US Geological Survey, Menlo Park, CA.
- 1987-88      *Fulbright-Hays Post-Doc Scholar,* C.S.I.R.O. Marine Lab, Queensland, Australia
- 1987      Ph.D.      Zoology/Microbiology, Louisiana State University, Baton Rouge
- 1984      Woods Hole, Marine Biological Laboratory
- 1982      M.S.      Zoology/Microbiology, Ohio University, Athens, OH.
- 1979      B.A.      Geology/Biology, Eastern Connecticut State University, CT

**APPOINTMENTS**

- 2014-present**      *Associate Dean for Research,* Arnold School of Public Health (ASPH), USC.
- 2010-2014**      *Associate Chair and Director of Graduate Studies,* Dept. ENHS, USC
- 2003-present**      *Professor,* Department of Environmental Health Sciences (ENHS), USC.
- 1998**      *Associate Professor,* Department of ENHS, USC.
- 1994**      *Assistant Professor,* Department of ENHS, Arnold School of Public Health, University of South Carolina (USC), Columbia, SC.
- 1989-93**      United States Geological Survey, Menlo Park, CA. (joint)
- 1988-93**      PostDoc/Research Scientist, Stony Brook University, New York (joint)

**RESEARCH FOCUS**

*Attached forms of Bacteria,* called *Biofilms,* in environmental and health settings.

*Biofilm Foci:* • chemical communication (quorum sensing); • extracellular polymeric matrix (EPS)

• microbial survival under extreme conditions/exobiology; • Isolation of novel antibiotics;

• use of nanotechnology for efficient delivery of antibiotics against resistant infections;

**PROFESSIONAL HONORS AND AWARDS**

- 2021      **AAAS Fellow** (American Assoc. for Advancement of Science) Elected Area: Microbiology;
- 2013      **FULBRIGHT Senior Research Fellow,** (University of St. Andrews, SCOTLAND);
- 2013      **MASTS Fellowship** (Marine Alliance for Science/Technology in Scotland), SCOTLAND;
- 2004      **American Society Microbiology (ASM) Division Q Lectureship;**
- 2003      **Educational Foundation Award for Research in Health Sciences** (USC);
- 1999      **Researcher of the Year – Arnold School of Public Health** (USC);
- 1990      **National Research Council (NRC) Postdoctoral Fellow,** USGS, Menlo Park, CA;
- 1987      **FULBRIGHT Postdoctoral Scholar,** CSIRO Marine Laboratory, Queensland, AUSTRALIA;
- 1983      **National Science Foundation (NSF) Dissertation Award.** (OCE-8313109);

## COURSES TAUGHT

- SCHC 401** – USC Honors College: Microbes in Health, Infections and Environments- Biofilms;  
**ENHS 450** – Introduction to Public Health Microbiology;  
**ENHS 665** - Biofilms in the Environment, Health and Disease;  
**ENHS 770** - Microbial Processes and Pollution;  
**ENHS 787** - Analytical Concepts in Environmental Health Sciences;

## GRANT REVIEW PANELS

2019. **NASA (National Aeronautics Space Admin),** *Exobiology Program*  
2018. **NASA (National Aeronautics Space Admin),** *Exobiology Program*  
2012. **NSF (National Science Foundation),** *Dimensions in Biodiversity Program*  
2008. **NSF (National Science Foundation),** *Microbial Observatories Program*  
2004. **NIEHS (National Institute Environ. Health Sci.),** *Superfund Program*  
2002. **NSF (National Science Foundation),** *Microbial Observatories Program*  
1999. **NIEHS (National Institute Environ. Health Sci.),** *Superfund Program*  
1998. **NSF (National Science Foundation),** *OCE Polar Programs*

## EDITOR AND EDITORIAL BOARDS

- Editor,* *Advances in Microbiology, 2013-2016;*  
*Editorial Board,* *Advances in Microbiology, 2010-2012;*  
*Guest Editor, Special Issue: 'Nanoparticle-Biofilm Interactions',* *Frontiers in Microbiology, 2015;*  
*Guest Editor, Special Issue: 'Biofilms: Extracellular Bastions of Bacteria' Inter. J. Mol. Sci. (IJMS) 2013;*

## JOURNAL REVIEWER:

- |                                       |  |
|---------------------------------------|--|
| <i>Science</i>                        | <i>PNAS (Proc. Natl. Acad. Sci. USA)</i> |
| <i>Nature Reviews in Microbiology</i> | <i>Nature Communications</i>             |
| <i>Ecology</i>                        | <i>Chemical Reviews</i>                  |
| <i>ISME Journal</i>                   | <i>Scientific Reports</i>                |
| <i>PLoS ONE</i>                       | <i>Geology</i>                           |
| <i>ACS Nano</i>                       | <i>JACS (J Amer Chem Soc)</i>            |
| <u><i>Others</i></u>                  |  |
| Applied Environmental Microbiology    | Trends in Microbiology                   |
| Drug Resistance                       | Advances in Microbiology                 |
| Frontiers in Microbiology             | International J Molecular Sciences       |
| NanoImpact                            | J. Industrial Microbiology               |
| Aquatic Biology                       | FEMS Microbial Ecology                   |
| Aquatic Ecology                       | Environmental Microbiology               |
| Aquatic Microbial Ecology             | J. Experimental Marine Biol. Ecology     |
| Biofouling                            | Biofilms                                 |
| Marine Biology                        | J. Sedimentary Research                  |
| Biogeochemistry                       | Marine Biotechnology                     |
| BioTechnology Journal                 | Marine Ecology Progress Series           |
| BioTechnology Progress                | Marine Environmental Research            |
| Canadian J. Fisheries & Aquatic Sci.  | Microbial Ecology                        |
| Carbohydrate Research                 | Methods in Enzymology                    |
| Continental Shelf Research            | Marine Chemistry                         |

Deep-Sea Research	Trans. American Microscopical Assoc.
Ecological Engineering	Microscopy and Microanalysis
Environmental Sci. & Technol;	Water Research
Sensors	Estuarine Coastal Shelf Science
Water Science and Technology	Polar Biology
J. Inorganic Biochemistry	J. Sedimentary Research
J. Phycology	J. Plankton Research

## FUNDED GRANTS

### Current Grants

- 2024 (*pending*) **National Institutes of Health (NIH-NIAID RO1)** 5 yrs  
*Molecular Engineering of Cationic Metallo-Polymers to Enhance Antibiotic Efficacy.*  
C. Tang (PI), **AW Decho**, M. Uline, M. Nagarkatti, C. Cai (Co-Is);
- 2024- (*pending*) **National Institutes of Health (NIH-NIAID RO1)** 5 yrs  
*Revisiting a Fundamental Microbial Paradigm: Non- Lethal Translocation (Uptake) of Particles into Bacteria.* **AW Decho (PI)**, M Chruszcz, J Lie, J Twiss, B Cai (Co-Is);
- 2021-2023 **Environmental Molecular Sciences Laboratory (EMSL)**, Pacific Northwest 2 yrs  
National Laboratory (PNNL); *Bacterial 'cell-cell talk' in complex microbial communities: identifying diverse and Novel quorum sensing signals in extreme environments.* **AW Decho (PI)**; P. Williams, S Donachie, R. Prescott, P. Chain (Co-Is).  
No USC funds; provides resources on-site (EMSL) instrumentation use. [[51876](#)]
- 2019-2024 **National Institutes of Health (NIH-NIAID RO1)** 5 yrs  
*Control of Facial Amphiphilicity to Tune Macromolecular Interactions with Bacteria.*  
C. Tang (PI). **AW Decho**, M. Nagarkatti (Co-PI); [[AI149810-01A1](#)]
- 2018-2023 **National Institutes of Environmental Health Sciences (NIEHS-PO1)**, 5 yrs  
*"Center for Assessment and Prediction of Interactions of Climate Change on Oceans and Human Health (CAPICCOHH): Assessment of Effects on Ocean Health Related Illness and Disease, and Development of Prevention Strategies to Better Protect Public Health.* G.I. Scott (Dir). RS Norman PI; **AW Decho** (Co-PI) [[1PO1 ES028942-01](#)]

### PAST GRANTS

- 2018-2023 **National Aeronautics Space Admin (NASA)**- Exobiology Program 5 yrs  
*Cooperation and Adaptability in Microbial Mats from Extreme Environments: Quorum Sensing and its Relation to Early Life on Earth and Elsewhere.*  
**AW Decho** (PI); PSG. Chain, S. Donachie (Co-Is); [[17-EXO17 20120](#)]
- 2017-2020 **National Science Foundation (NSF)** Post-Doctoral Research Fellowship 3 yrs  
**PI: Rebecca Prescott**, (Mentor) **AW Decho**. *NSF Postdoctoral Fellowship in Biology FY 2017 Topic: QS-mediated changes in gene expression in microbial mats of extreme environments.* [[DBI-1711856](#)]
- 2016-2019 **National Science Foundation (NSF)** - BioMaterials Prg. 4 yrs  
Facial amphiphilic antimicrobial biomaterials-containing fused multicyclic structures.  
PI C Tang, Co-PI: **AW Decho**, J. Ebalunode; [[1608151](#)]

- 2015-2019 **National Institutes of Health (NIH-RO1)** [\[AI120987\]](#) 4 yrs  
*Establishing a New Paradigm of Metallopolymers to Reinstate Vitality of Antibiotics against Multidrug Resistant Bacteria.* PI: C Tang, Co-I: **AW Decho**, M Nagarkatti, M Chruszcz;
- 2012-2015 **National Science Foundation (NSF)** Biomaterials Prog. [\[1206072\]](#) 3 yrs  
*Natural resin acid-containing antimicrobial materials: synthesis, mechanisms of action.* PI: C Tang; Co-PI: **AW Decho**;
- 2010-2014 **National Science Foundation (NSF)** Biomed Eng (BME)Prog. [\[1032579\]](#) 3 yrs  
*Engineering the surface chemistry of nanoparticles: a two-stages attack on Infection biofilms.* PI: **AW Decho**, Co-PI: Benicewicz BC.
- 2007-2010 **National Science Foundation (NSF)** Environ. Gen. Prog. [\[0723707\]](#) 3 yrs  
*En-Gen: Bacterial communication in microbial mats: Metagenomic Approach to understanding quorum sensing gene diversity/ expression.*  
(PI: RS Norman Co-PI: AW Decho)
- 2006-2008 **DOE: Community Sequencing Program (CSP)** (2 yrs) *Sequencing lithifying (CaCO<sub>3</sub>) marine stromatolite mat communities relevant to carbon record*  
(PI: **AW Decho**; Co-PIs: RS Norman, RP Reid, PT Visscher)
- 2005-2010 **National Science Foundation (NSF)**, CRC Program [\[0526821\]](#) 3 yrs  
*Characterization of Changes in molecular structure and activity of autoinducer molecules relevant to bacteria chemical communication.*  
(PI: **AW Decho**; Co-PIs: J Ferry, SM Angel, PL Ferguson)
- 2003-2008 **National Science Foundation (NSF)** BioComplexity Prog. [\[0221796\]](#) 3 yrs  
*Biocomplexity of marine stromatolites: Biogeochemical cycling, microbial population dynamics, and mineral formation in a three billion year old ecosystem.* PI:RP Reid, Co-PI: AW Decho, P Visscher, R Marinelli, J Stolz
- 2002-2007 **National Science Foundation (NSF)** Microbial Observatories Program 5 yrs  
*Anhydrophilic, halotolerant microbial mats of San Salvador Island, Bahamas.*  
(PI: H. Paerl; Co-PI: AW Decho, T. Steppe, J. Pinckney) [\[0132528\]](#)
- 2000-2004 **National Oceanic and Atmospheric Administration (NOAA).** 5 yrs  
*Land-use effects on bioavailability and toxicity of urban contaminants in Waters/ Sediments of Coastal Estuaries* PI: **AW Decho**; Co-PI: Chandler)
- 1997-2000 **Department of Defense (DOD).** *Accelerated Research on biofouling.* 3 yrs  
(PI: M Fletcher; CoPI: AW Decho, C Lovell)
- 1997-2000 **Environmental Protection Agency (EPA)/ EPSCoR.** *A Multidisciplinary Effort Linking Impacts of Sediment Contaminants on Toxicological Responses with Genetic Adaptation* (PI: BC Coull; CoPI: A Decho, GT Chandler, T Shaw, JQuattro)
- 1996-2002 **Office of Naval Research (ONR).** Environ. Optics Program, 7 yrs  
*Microbial Biofilms: A Parameter Altering the Optical Properties of Sediments and Other Surfaces.* PI: **AW Decho**
- 1996-2002 **National Oceanic and Atmospheric Administration (NOAA).** Office of Oceanic Research Programs, *Urbanization of southeastern estuarine systems*

- (USES). Co-Directors J Vernberg and W Vernberg. **Decho** (Co-I)
- 1996-1999 **National Science Foundation (NSF)** Biol. Oceanogr. Prog [[OCE-9617738](#)] 3 yrs  
*Microstructure in Modern Marine Stromatolites: A Geomicrobiological Investigation of Processes forming Lithified Micritic Laminae.*" (PI: RP Reid; Co-PI: **AW Decho**, PT Visscher)
- 1995-1998 **National Science Foundation (NSF)** Biol Oceanogr. Prog [[OCE-9416749](#)] 3 yrs  
*Experimental Analysis of Waterborne Chemical Cues as Agents Regulating Larval Settlement-Metamorphosis.*(PI: RK Zimmer; Co-PI: **AW Decho**, J Eckman)
- 1983-1985 **National Science Foundation (NSF)** Biol. Oceanogr. Prog. [[OCE-8313109](#)] 3 yrs  
*Dissertation Grant. Interactions of microbial flora and dissolved organic compounds with estuarine meiofauna.* PI: JW Fleegeer; Co-PI: **AW Decho**,

## **PUBLICATIONS**

### **FIVE NOTEWORTHY PUBLICATIONS**

- Rahman, MA; Bam, M; Luat, E; Jui, MS; Ganewatta, M; Shokfai, T; Nagarkatti, M; **Decho, AW**; Tang, C.  
2018. *Macromolecular-Clustered Facial Amphiphilic Antimicrobials.* **Nature Communications** 9, 5231, doi: [10.10038/s41467-018-07651-7](#). [IF = 12.1]
- Decho AW**, RL Frey, and JL Ferry 2011. *Chemical challenges to bacterial AHL signaling in the environment.* **Chemical Reviews** 111(1), 86-99 doi: [10.1021/cr100311q](#) [JOURNAL COVER, IF=24]
- Ferry JL, P Craig, C Hexel, P Sisco, R Frey, PL Pennington, MH Fulton, IG Scott, **AW Decho**, S Kashiwada, CJ Murphy, TJ Shaw. 2009. *Transfer of gold nanoparticles from the water column to the estuarine food web.* **Nature Nanotechnology** 4(7), 441-444. [IF = 21]  
[doi-org.pallas2.tcl.sc.edu/10.1038/nnano.2009.157](#)
- Reid RP, PT Visscher, **AW Decho**, et al. 2000. *The role of microbes in accretion, Lamination, and early lithification of modern marine stromatolites.* **Nature** 406 (6799), 989-992. [IF = 33]  
[doi-org.pallas2.tcl.sc.edu/10.1038/35023158](#)
- Decho AW**. 1990. *Microbial exopolymer secretions in ocean environments: Their role(s) in food webs and marine processes.* **Oceanography Marine Biology Annual Reviews** 28, 73-154.  
[Doi.org/10.1201/9781482267280](#). eBook ISBN 9780429077715. [>1740 cites]

### **PUBLICATIONS**

[Citations: [Google Scholar >15,500](#); [H=57](#); [i10=105](#); [WOS >9,650](#); [H=49](#)]

134. [Barman S](#), [R Leighton](#), L Kurnaz, C Tang, **AW Decho**. *Combating non-inherited antibiotic resistance: molecular designs in tackling microbial biofilm- and persister-associated infections.* **BioMaterials** (in review).
133. [Prescott R.](#), Chan Y, Tong E 'Iwakeli'i, , Onouye CT, Handel C, Lo C-C, Davenport K, Johnson, S, Flynn M, Saito JA, Lee H, Lawson BN, Hiura K, Sager K, Sadones M, Esibill D, Cockell CS, Santomartino R, Chain PSG, **Decho AW**, Donachie, SP. 2023. Bridging place-based science education and space research through microbial genomics, with descriptions of *Bradyrhizobium prioritasperba*, sp. nov., *Dickeya ulupoensis*, sp. nov., and *Pseudoflavitalea hawaiiensis* sp. novel. **Astrobiology** 23/12. 1348-1367. doi: [10.1089/ast.2023.0072](#)
132. Balbay MG, Shlafstein M, Cockell C, Cady SL, [Prescott RD](#), Lim D, Chain PSG, Donachie SP, **Decho AW**, Saw JH. 2023. Metabolic potential and phylogenetic placement of novel

- Aigarchaeota from geothermal features of Hawai'i and Chile. **Frontiers in Microbiology** 14: 1216591. doi: [10.3389/fmicb.2023.1216591](https://doi.org/10.3389/fmicb.2023.1216591)
131. Leighton RE, Xiong L, Anderson GK, Astarita G, Cai G, Norman RS, **Decho AW**. 2023. *Vibrio parahaemolyticus* and *Vibrio vulnificus* In Vitro Biofilm Dispersal from Microplastics Influenced by Simulated Human Environmental Factors. **Frontiers in Microbiology** 14: 1236471. doi: [10.3389/fmicb.2023.1236471](https://doi.org/10.3389/fmicb.2023.1236471)
130. Jesmin R, JW Cary, M Lebar, R Majumdar, PM Gummadidala, T Dias, S Chandler, P Basu, **AW Decho**, NP Keller, A Chanda. 2023. *Vibrio gazogenes* dependent disruption of aflatoxin biosynthesis in *Aspergillus flavus*: the connection with endosomal uptake and hyphal morphogenesis. **Frontiers in Microbiology** 14: 1208961. doi: [10.3389/fmicb.2023.1208961](https://doi.org/10.3389/fmicb.2023.1208961)
129. Barman, S, Kurnaz L; Li X; Nagarkatti M; Nagarkatti P; **Decho, AW**; Tang, C. 2023. Facially Amphiphilic Bile Acid Functionalized Antimicrobials: Combating Pathogenic Bacteria, Fungus, and their Biofilms. **ACS Infectious Disease** 9, 9, 1769-1782. doi: [10.1021/acsinfecdis.3c00266](https://doi.org/10.1021/acsinfecdis.3c00266)
128. Correa Velez KE, RE Leighton, **AW Decho**, JL Pinckney, and RS Norman. 2023. Modeling pH and temperature effects as climatic hazards in *Vibrio vulnificus* and *Vibrio parahaemolyticus* planktonic growth and biofilm formation. **GeoHealth** 7: 4, e2022GH000769 doi: [10.1029/2022GH000769](https://doi.org/10.1029/2022GH000769)
127. Leighton, R, KE Correa Vélez, L. Xiong, AG Creech, KP Amirichetty, GK Anderson, G Cai, RS Norman **AW Decho**. 2023. *Vibrio parahaemolyticus* and *Vibrio vulnificus* Colonization on Plastics Influenced by Temperature and Strain Variability. **Frontiers in Microbiology**. 13: 1099502. doi.org/[10.3389/fmicb.2022.1099502](https://doi.org/10.3389/fmicb.2022.1099502)
126. Kurnaz L; Luo Y; Li X; Alabresm A; Leighton R; Kumar R; Hwang J; **Decho AW**; Nagarkatti P; Nagarkatti M; Tang C. 2023. Facial Amphiphilicity Index as a Robust Tool to Correlate Chemical Structures with Antimicrobial Efficacy. **Bioactive Materials** 20: 519-527. doi.org/[10.1016/j.bioactmat.2022.06.009](https://doi.org/10.1016/j.bioactmat.2022.06.009) (IF = 16.8)
125. Li H, Yang P, Hwang J-H, Pageni P, **Decho AW**, Tang C. 2022. Antifouling and Antimicrobial Cobaltocenium-Containing Metallopolymer Double-Network Hydrogels. **Biomaterials Translational** 3(2): 162. doi.org/[10.12336/biomatertransl.2021.01.000](https://doi.org/10.12336/biomatertransl.2021.01.000) (IF = 12.4)
124. Prescott RD, Zamkovaya T, Donachie SP, Northup DE, Medley JJ, Monsalve N, Saw JH, **Decho AW**, Chain PSG, Boston PJ. 2022. Islands Within Islands: Bacterial Phylogenetic Structure and Consortia in Hawaiian Lava Caves and Fumaroles. **Frontiers in Microbiology** 13: 934708. doi: [10.3389/fmicb.2022.934708](https://doi.org/10.3389/fmicb.2022.934708)
123. Suosaari E, AM Oehlert, I Lascu, **AW Decho**, AM Piggot, AT Palma, PF Machabee, RP Reid. 2022. Environmental and biological controls on sedimentary bottom types in the Puquios of the Salar de Llamara, northern Chile: An EPS Story. **Geosciences** 12, 247. doi.org/[10.3390/geosciences12060247](https://doi.org/10.3390/geosciences12060247)
122. Cao X, L Xu, YP Chen, **AW Decho**, Z Cui, J Lead. 2022. Contribution, composition and structure of EPS by *in vivo* exposure to elucidate the mechanisms of nanoparticle-enhanced bioremediation to heavy metals. **Environmental Science & Technology** 56, 896–906; DOI: [10.1021/acs.est.1c05326](https://doi.org/10.1021/acs.est.1c05326) [IF = 11.3]
121. Bose D, S Chatterjee, E Older, R Seth, P Janulewicz, P Saha, A Mondal, **AW Decho**, K Sullivan, N Klimas, S Lasley, J Li, S Chatterjee. 2022. Altered gut resistome presents a unique biome signature in chronic multi-symptom illness and links persistent pro-inflammatory phenotype in a preclinical model. **Communications Biology** 5:552;

- doi.org/10.1038/s42003-022-03494-7 [IF = 6.3]
120. Alabresm A, **AW Decho**, J Lead. 2021. A novel method to estimate cellular internalization of nanoparticles into Gram-negative bacteria: Non-lytic removal of outer membrane and cell wall. **NanoImpact** 21: 100283; doi: 10.1016/j.impact.2020.100283.
119. Yang, P, Luo, Y, L. Kurnaz, M Bam, X Yang, **AW Decho**, M Nagarkatti, C Tang. 2021. Biodegradable polycaprolactone metallopolymer-antibiotic bioconjugates containing phenylboronic acid and cobaltocenium for antimicrobial applications. **Biomaterials Science** 9: 7237-7246. doi: 10.1039/D1BM00970B. (IF= 7.6)
118. Alabresm A, SL Chandler, BC Benicewicz, **AW Decho**. 2021. NanoTargeting of Resistant Infections with Special Emphasis on the Biofilm Landscape. **Bioconjugate Chemistry** 32: 1411-1430. doi.org/10.1021/acs.bioconjchem.1c00116. PMC8527872; PMID: 34319073 (IF = 4.7)
117. Cao X, L Xu, **AW Decho**, J. Lead. 2021. A method for cultivation, fractionation, and metal determination to evaluate metal removal by the combination of NPs and bacteria. **MethodsX**, 8: 101550. doi: 10.1016/j.mex.2021.101550
116. Alabresm, A., YP Chen, S Wichter-Chandler, J Lead, BC Benicewicz, **AW Decho** 2020. Nanoparticles as antibiotic-delivery vehicles (ADV) overcome resistance by MRSA and other MDR bacterial pathogens: the grenade hypothesis. **Journal Global Antibiotic Resistance** 22: 811-817 doi.org/10.1016/j.jgar.2020.06.023. PMID: 32653724; PMCID: PMC8547500.
115. Prescott, RD and **AW Decho**. 2020. Flexibility and adaptability of quorum sensing in nature. **Trends in Microbiology** 28(6):436-444. doi.org/10.1016/j.tim.2019.12.004; (Journal Cover: IF= 13)
114. Rahman, MA; Jui, MS; Bam, M; Cha, Y; Luat, E; Alabresm, A; Nagarkatti, M; **Decho, AW**; Tang, C. 2020. Facial Amphiphilicity-Induced Polymer Nanostructures for Antimicrobial Applications. **ACS Applied Materials & Interfaces** 12(19): 21221-21230. doi: 10.1021/acsami.9b19712
113. Cao, X, Alabresm, A, Chen, YP, **Decho, AW**, Lead, J. 2019. Improved metal remediation using a combined bacterial and nanoscience approach. **Science of Total Environment** doi:10.1016/j.scitotenv.2019.135378.
112. Yang, P, Pageni P, Rahman MA, Bam M, Zhu T, Cheng YP, Nagarkatti M, **Decho AW**, Tang C. 2019. Gold Nanoparticles with Antibiotic-Metallopolymers toward Broad-Spectrum Antimicrobial Effects. **Advanced Healthcare Materials** 1800854; doi:10.1002/adhm.201800854. PMC6426663
111. Decho, AW. 2018. Biological hotspots in oceans as unique reservoirs for novel antibiotics. **Journal of Marine Microbiology**. 2(1): 14-16.
110. Rahman MA; Bam M; Luat E; Jui MS; Shokfai T; Nagarkatti M; **Decho AW**; Tang C. 2018. Macromolecular-Clustered facial amphiphilic antimicrobials. **Nature Communications** 9, 5231, doi: 10.10038/s41467-018-07651-7. PMC6286373. (IF= 12.1)
109. Pageni P; Yang P; Bam M; Zhu T; Chen YP; **Decho AW**; Nagarkatti M; Tang C. 2018. Recyclable Magnetic nanoparticles grafted with antimicrobial metallopolymer-antibiotic bioconjugates. **BioMaterials** 178:363-372. Doi:10.1016/j.biomaterials.2018.05.007. PMC6054821 (IF= 14)
108. Ganewatta, MS; Rahman, MA; Mercado, L; Shokfai, T; **Decho, AW**; Reineke, TM; Tang, C. 2018. Facially amphiphilic polyionene biocidal polymers derived from Lithocholic acid. **Bioactive Materials** 3(2): 186-193. doi.org/10.1016/j.bioactmat.2018.02.001. PMC5935773. (IF= 14.1)
107. Pageni P; Yang P; Chen YP; Huang Y; Bam M; Zhu T; Nagarkatti M; Benicewicz B; **Decho AW**; Tang C. 2018. Charged Metallopolymer-Grafted Silica Nanoparticles for Antimicrobial Applications. **Biomacromolecules**. 19(2): 417-425; doi: 10.1021/acs.biomac.7b01510 PMC5971106 (IF= 6.1)
106. Alabresm, A; YP Chen; **AW Decho**; J Lead. 2018. A Novel Method for the Synergistic Remediation of

- Oil-Water Mixtures Using Nanoparticles and Oil-Degrading Bacteria. **Science of Total Environment** 630:1292-1297. doi: [10.1016/j.scitotenv.2018.02.277](https://doi.org/10.1016/j.scitotenv.2018.02.277)
105. Astasov-Frauenhoffer M, Varenganayil MM, **Decho AW**, Waltimo T, Braissant O. 2017. Exopolysaccharides regulate calcium flow in cariogenic biofilms. **PLoS ONE** 12(10): e0186256. doi.org/[10.1371/journal.pone.0186256](https://doi.org/10.1371/journal.pone.0186256). PMC5638444
104. Gummadidala PM, Holder ME, O'Brien JL, Ajami NJ, Petrosino JF, Mitra C, Chen YP, **Decho AW**, Chanda A. 2017. Complete genome sequence of *Vibrio gazogenes* ATCC 43942. **Genome Announcements** 5(30), e00733-17. doi: [10.1128/genomeA.00733-17](https://doi.org/10.1128/genomeA.00733-17). PMC5532843
103. **Decho, AW**, and T Gutierrez. 2017. Microbial Extracellular Polymeric Substances (EPS) in Ocean Systems. **Frontiers in Microbiology** 8, 922; doi: [10.3389/fmicb.2017.00922](https://doi.org/10.3389/fmicb.2017.00922).
102. Alabresm, A., S. Mirshahghassemi, GT Chandler, **AW Decho**, J Lead. 2017. Use of PVP-coated magnetite nanoparticles to ameliorate oil toxicity to a marine estuarine meiobenthic copepod and stimulate growth of oil-degrading bacteria. **Environmental Science: Nano**. 4, 1859-1865. doi: [10.1039/c7en00257b](https://doi.org/10.1039/c7en00257b).
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**PATENTS:**

1. **2023.** Nanoparticles for the amelioration of oil toxicity and stimulation of bacterial oil degradation. Approved: US Patent No. 11,814,308-B2;
2. **2018.** Divisional Patent: Anion-paired cationic Metallocene-containing compounds and polymers as Antimicrobial Agents. Approved: US Patent No. 9,872,917
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8. **2013.** Rosin-derived cationic compounds and polymers and their methods of preparation. Approved: US Patent No. 8,604,128.

## KEYNOTE ADDRESSES

2021. **Decho, AW.** KEYNOTE: *Why have microbial mats persisted through Geologic time: Evidence from present day.* M-FED Annual Conference, held *Museum National d'Histoire Naturelle*, Paris, **FRANCE**. Oct 12-16.
2018. **Decho, AW.** KEYNOTE. *Attacking Bacterial Pathogens using Nanoparticle-based Approaches: Steps and Hurdles.* EuroSciCon 6<sup>th</sup> International Conference on Antibiotics, Antimicrobials & Resistance, held Edinburgh, **SCOTLAND** October 11-12.
2018. **Decho, AW.** KEYNOTE: *The Biofilm: Efficient, Adaptable & Structured.* 19<sup>th</sup> International Conference on Marine Corrosion and Fouling. Melbourne, FL.
2008. **Decho, AW.**, Przekop, K.M., Braissant, O., Gallagher, C. Glunk, C. ,Dupraz, C. & Visscher, P.T. KEYNOTE: *An emerging framework for understanding Marine Stromatolite Formation.* International Kalkowsky- Symposium on the "Geobiology of Stromatolites" celebrating the 100<sup>th</sup> Anniversary of their Discovery, Göttingen, Germany, Oct 4-11, 2008.
2008. **Decho, AW.** KEYNOTE: *Biopolymer-induced mineralization and its impact on material/soil properties.* 1<sup>st</sup> International Conference on BioGeoCivil Engineering (BGCE), held June 23-25, 2008. Delft, The Netherlands

## INVITED SPEAKER

2022. **Decho AW** and R Prescott (INVITED). Desiccation Resiliency of Natural Biofilms enhanced by EPS matrix-Evidence of organic glass formation. Amer. Society Microbiology Biofilms Conference, Charlotte, NC (November 2022). Host: Clay Fuqua
2017. **Decho AW.** (Platform INVITED) Biofilms as a natural antibiotic-resistant bastion for bacteria. SOCIETY OF ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY (SETAC) Annual Meeting. Session: Development of Microbial Environmental Resistance. Minneapolis, MN. (Nov).
2014. **Decho AW.** (INVITED) Unique and baffling aspects of the Natural EPS matrix in situ. IWA Conference (The Perfect Slime – nature, properties, regulation and dynamics of EPS. Held University of Duisburg-Essen, **GERMANY**, held Sept 10-14, 2014. Host: H.-C. Flemming.
2014. **Decho AW.** (INVITED) *Margalef Lecture*, University of Vienna, **AUSTRIA**. "Biofilms remixed: Microbial Mats and Stromatolites" (May 2014) Host: T. Battin.
2014. **Decho AW.** (INVITED). *Natural biofilms of stromatolites and other microbial mats.* International Conference on Biofilm6, held Vienna, **AUSTRIA** (May 2014); Host: T. Battin
2012. **Decho, AW.**, B. Lau, K. Ikuma. (INVITED). When Nanoparticles enter the 'house of bacteria' - Role of biofilms in fate and transport. Sustainable Nanotechnology Organization (SNO) 1<sup>st</sup> Annual Conference, held Arlington, VA. (Nov. 2011) Host: B. Karn
2011. **Decho, AW.** (INVITED). *Quorum sensing in nature: What happens out there?* Gordon Research Conference on Geobiology of Precambrian Earth, held Jan 30-Feb 4,

- Ventura, CA. Host: N. Noffke
2010. **Decho, AW.** (INVITED) Biofilms and quorum sensing in marine systems: An overview. ASLO-AGU Annual Meeting, held Portland OR Feb 2010.
2008. **Decho AW.** (INVITED) *EPS: An elusive refugia for bacteria in water systems*. Trans Atlantic Water Symposium, held Baton Rouge, LA. Mar 29-Apr 2, 2008. Host: Prof. Dr. H.-C. Flemming
2004. **Decho AW.** (INVITED) 'The *Division Q Lecture*' American Soc. Microbiol. (ASM) Ann. Conf., 'Cyanobacterial EPS in Marine Systems'. New Orleans, LA. (May) Host: Dr. Keith Cooksey.
2003. **Decho AW.** (INVITED) American Society of Limnology and Oceanography (ASLO) Annual Conference, Salt Lake City, UT. Feb. 2003
2001. **Decho AW.** (INVITED) Microbial Mat Symposium II. "Fossil and Recent Biofilms". held in Oldenburg Universitat, **GERMANY**. Host: Prof. Dr. W.E. Krumbein
2000. **Decho AW.** (INVITED) International Water Association(IWA)- Specialist Conference on Biofilms, Universitat Duisburg-Essen, **GERMANY**, The Environmental Significance of Microbial Biofilms, held (Sept.). Host: Prof. Dr. H.-C. Flemming
1999. **Decho AW.** (INVITED) University of Plymouth, Plymouth, **ENGLAND**, European Community International Conference On Intertidal Mudflats, properties and processes. *Microbial Biofilms in Intertidal Systems* (April) Host: Prof. Keith Dyer.
1999. **Decho AW.** (INVITED) American Society of Limnology & Oceanography (ASLO). Symposium on Microbial Biofilms and Mucilage in Ocean Processes. 'New Approaches in the Characterization of Microbial EPS' (February)
1996. **Decho AW.** (INVITED) American Society of Microbiology (ASM) Annual Conference, New Orleans, LA. *Sorption of Molecules to Hydrophilic Extracellular Polymers: Do Hydrophobic Microzones Exist?*. Host: Dr. John Lawrence.
1996. **Decho AW.** (INVITED) American Society of Microbiology Conference on MICROBIAL BIOFILMS, Snowbird, Utah. *Partitioning of Extracellular Enzyme Activities within Microbial Biofilms*. Host: Dr. J. W. Costerton.
1993. **Decho AW.** (INVITED) *Assessing the role of exopolymers in microbial mats: techniques.*" NATO Advanced Research Workshop on Microbial Mats, Arcachon, **FRANCE**.
1993. **Decho AW.** (INVITED) International Symposium on Sediment Stabilization, Univ. Oldenburg, **GERMANY**; "*Extracellular Polymeric Substances and Sediment Stabilization.*" Host: Prof. Dr. W.E. Krumbein.
1993. **Decho AW.** (INVITED) NOAA Symposium: Sustainable Development in the Southeastern Coastal Zone. Myrtle Beach, South Carolina; "*Factors Influencing the Bioavailability of metals in bivalve food*". Host: Dr. F. John Vernberg
1992. **Decho AW.** (INVITED) International-Workshop on "Mucilage Phenomenon of the Adriatic Sea, held Cesenatico, **ITALY**; "*Microscale Parameters influencing the degradation of exopolymer mucilages.*" Host: Dr. RA Vollenweider.

## SEMINARS

2014. **Decho, AW.** (Seminar). *Natural biofilms of stromatolites and other microbial mats*. University of Vienna, Dept. Biology, held Vienna, **AUSTRIA** (May 2014); Host: T. Battin
2013. **Decho, AW.** (SEMINAR) Herriot Watt University, Dept. Biology, **SCOTLAND** 'Bacterial Biofilms and Applications of Engineered Nanoparticles to their study and control. (May 2013)
2013. **Decho, AW.** (SEMINAR) Scottish Oceans Institute (SOI), Univ. St. Andrews, **SCOTLAND**. 'Roles of Bacterial Biofilms and Chemical Communication in Coastal Sediment Systems:



- Insights into Sediment Stabilization.* Host: Dr. David Paterson
2012. **Decho, AW.** (SEMINAR) Old Dominion Univ., Dept Earth & Ocean Sciences. *Extracellular Polymeric (EPS) Matrices of Biofilms: An elusive but emergent property of natural microbes.* Host: Dr. Nora Noffke
2010. **Decho, AW.** (SEMINAR): Department of Biology, Indiana University. *What happens out there?: Quorum sensing under natural conditions.* Host: Dr. W. Clay Fuqua
2009. **Decho, AW.** (SEMINAR). Department of Geology, Baylor University. *'Biofilms: a sorptive sponge for environmental release of nanoparticles.* Host: Dr. Boris Lau.
2007. **Decho AW.** (SEMINAR) College of Charleston (SC), Dept. Biology. *"Chemical Communication in Microbial Mats: A biogeochemical Challenge.* Dec. 2007 Host: Dr. I. DeBuran
2006. **Decho AW.** (SEMINAR) National Institutes of Health (NIH), Washington, SC (BioPhysics Group). *'Role of Bacterial Biofilms and EPS in Health and Disease'.*
2005. **Decho AW.** (SEMINAR) Agouron Institute, La Jolla, CA. *"The Illusive EPS Matrix of Bacteria.* Host : Dr. Mel Simon (Caltech)
2004. **Decho AW.** (SEMINAR) Duquesne University, Department of Biology, Pittsburgh, PA.: *'Probing the Earth's Earliest Biofilms'* Host: Dr. John Stolz.
2004. **Decho AW.** (SEMINAR) Old Dominion University, Department of Oceanography, Norfolk, VA.: *'Marine Stromatolites and the earth's earliest biofilms',* Host: Dr. Nora Noffke
1992. **Decho AW.** (SEMINAR) Monterey Bay Aquarium Research Institute, Monterey, CA. *"Exopolymers of microbial origin: source of DOM and POM."* Host: Dr. Jim Barry.
1991. **Decho AW.** (SEMINAR) Michigan Technological Univ., Dept. Biol. Sci. SEMINAR: *"Role(s) of microbial exopolymers in ocean processes."* Host: Dr. Stephen Bowen.
1989. **Decho AW.** (SEMINAR) University of California-Santa Cruz, Dept. Appl. Sci. *"Exopolymers of bacteria: Source of labile carbon for deposit-feeders."* Host: Dr. Ken Bruland
1989. **Decho AW.** (SEMINAR) University of Connecticut, Dept. Marine Sci., Avery Point. *"Role(s) of microbial exopolymers in ocean processes."* Host: Dr. Robert Whitlatch
1988. **Decho AW.** (SEMINAR) Queensland Univ., Dept. Microbiol.,Brisbane, **AUSTRALIA.** *"Uptake and utilization of bacterial exopolymer by a harpacticoid copepod".*
1988. **Decho AW.** (SEMINAR) CSIRO Darling-Murray Freshwater Research Laboratory, Albury, N.S.W., **AUSTRALIA.** *"Uptake/utilization of bacterial exopolymer by harpacticoid copepods".*

## CONFERENCE/SESSION ORGANIZER

### NATIONAL CONFERENCE Organizer.

2004. **CONFERENCE ORGANIZING CHAIR**, AMERICAN SOCIETY OF LIMNOLOGY OCEANOGRAPHY (ASLO) International Conference, held Savannah, GA. July 2004

### SESSION Organizer

2005. **Session Co-Organizer**, EUROPEAN GEOSCIENCES UNION (EGU) Annual Meeting, (Session Organizer: T. Battin, H. Lapin-Scott, A. Decho, M. Wagner), Vienna, AUSTRIA, April 2005.
- 2001 **Session Co-Organizer:** Special Session on *"BioGeochemistry of Marine Stromatolites: A 3 Billion Year Old Ecosystem;* AMERICAN SOCIETY OF LIMNOLOGY AND OCEANOGRAPHY (ASLO), Annual Meeting, Santa Fe, NM (February); w/ co-organizer: Dr. P. Visscher.
- 2000 **Session Co-Organizer:** International Specialist Conference on *"Extracellular Polymeric Substances",*

sponsored by the INTERNATIONAL WATER ASSOCIATION (IWA), held Mülheim, GERMANY (September); Co-Org.: H.-C. Flemming; T. Neu, A. Leis.

- 1998** **Session Co-Organizer:** Special Session on “*Microbial Polymers in Marine Systems*” at AMER. SOC LIMNOLOGY OCEANOGRAPHY (ASLO) Ann. Meeting, Santa Fe, NM (Feb) w/co-org.: Dr. A. Alldredge.
- 1995** **Session Co-Organizer:** Special Session on “*Microbial Biofilms*” at AMERICAN SOCIETY OF MICROBIOLOGY (ASM) Annual Meeting, New Orleans, LA (May); w/co-organizer: Dr. J. Lawrence.

## CONFERENCE PAPERS AND PRESENTATIONS

(excludes INVITED and KEYNOTES listed above)

- Prescott RD, PJ Boston, DE Northup, MN Spilde, **AW Decho**. 2023. Survival in extreme environments through cross-domain cooperation: Is quorum sensing essential to bacterial-fungal interactions in lava caves and beyond? European Astrobiology Institute, Annual Mtg., held Azores Is.
- Al-Ali M, Chandler S, **Decho AW**, Benicewicz BC. 2019. Designing “Sweet-Nanoparticles” as a novel strategy to combat antibiotic-resistant bacteria. AMERICAN CHEMICAL SOCIETY (ACS) Annual Mtg., Boston, MA.
- Prescott R, ‘Iwakeli’i Tong E, Lo C-C, Gleanser C, Donachie SP, Chain PSG, Chan Y, Esibill D, **Decho AW**, Davenport K, Johnson S, Lee H. 2019. *O na Hoku no na kiu o ka lani*: Bridging Genomics Research and Culture-based Science Education through Astrobiology in Hawai’i. Oxford Nanopore Conference, London, U.K., Feb.
- Chanda A, Gummadidala, P.M., Chen, YP, Beauchesne, Miller K, Mitra C, Banaszek N, Velez-Martinez M, Moeller PDR, Ferry JL, **Decho AW**. 2016. Aflatoxin response metabolites from *Vibrio gazogenes*: a novel system of generation of aflatoxin inhibitors. *WMFmeetsIUPAC*, Winnipeg, Canada.
- Ganewatta MS, Chen YP, Miller K, **Decho AW**, Tang C. 2014. Sustainable antimicrobial coatings from resin acids. AMERICAN CHEMICAL SOCIETY (ACS) Annual Mtg. Vol. 247.
- Wang L, Chen YP, Cole M, Zhen Y, Benicewicz BC, **Decho AW**. 2014. Synthesis and characterization of water-soluble multi-functionalized magnetic nanoparticles via RAFT polymerization. AMERICAN CHEMICAL SOCIETY (ACS) Annual Mtg. Vol. 247.
- Ikuma K, A Madden, **AW Decho**, B Lau. 2014. Nanoparticle-Biofilm interactions at the interface: Importance of surface physicochemical characteristics. IWA PS2014 SPECIALIST CONFERENCE: *Advances in Particle Science and Separation: from Nanoscale and Beyond*. Sapporo, Japan.
- Wang L, Chen YP, **Decho AW**, Benicewicz BC. 2013. Preparation of dye-labeled poly(methacrylic acid) grafted silica nanoparticles for antimicrobial applications. USC Oakwood Products Poster Competition, Columbia, SC, February 22, 2013. PUBLISHED;
- Wang L, Chen YP, **Decho AW**, Benicewicz BC. 2013. Synthesis and characterization of dye-labeled poly(methacrylic acid) grafted silica nanoparticles. 2<sup>nd</sup> ACS POLY/PMSE Student Chapter (USC) Industry Panel Presentation, Columbia, SC, August 16<sup>th</sup>, 2013. PUBLISHED;
- Wang L, Miller KP, Viswanath A, Benicewicz BC, **Decho AW**. 2012. Nanoparticle-based antimicrobial paint. The Proving Ground Entrepreneurial Challenge, Columbia, SC, November 13, 2012. PUBLISHED;
- Wang L, Cash BM, Chen YP, **Decho AW**, Benicewicz BC. 2012. Synthesis and characterization of dye-labeled poly(methacrylic acid) grafted silica nanoparticles for drug delivery applications. 244<sup>th</sup> AMERICAN CHEMICAL SOCIETY (ACS) National Meeting, Philadelphia, PA, August 19-23, 2012. PUBLISHED;
- Wang L, Cash BM, Chen YP, **Decho AW**, Benicewicz BC. 2012. Synthesis and Characterization of Dye-Labeled Carboxylic Acid Coated Silica Nanoparticles for Drug Delivery Applications. IUPAC Macro2012, Blacksburg, VA, 6/24-28/12. PUBLISHED;
- Ferry JL, RL Frey, **AW Decho**. 2010. *Effects of hydroxyl radical mediated oxidation on N-acylhomoserine lactones used in microbial signaling: rates, products, and effects on signaling activity*. AMERICAN CHEMICAL SOCIETY (ACS) Annual Meeting, Boston, MA. August 2010. Abst. #26. PUBL.

- Ferry JL, RL Frey, JM Burns, TJ Shaw, CJ Murphy, P Sisco, **AW Decho**, GT Chandler, P Pennington, M Fulton. 2010. *Effects of surface charge on the partitioning of gold nanorods in saline estuarine mesocosms*. AMERICAN CHEMICAL SOCIETY (ACS) Annual Meeting, Boston, MA. Aug. Abst. #164.
- Frey R, Pellechia PJ, **Decho AW**, Ferry JL. 2010. Effects of pH, temperature, and salinity on microbial communication: speciation of autoinducer-2 in the aquatic environment. AMERICAN CHEMICAL SOCIETY (ACS) Annual Mtg. Vol. 239.
- Afroz, AN, Q Zaib, **AW Decho**, NB Saleh. 2010. *Role of nanoparticle geometry on nano-biointeractions: a quest to separate physics from chemistry*. AMERICAN CHEMICAL SOCIETY (ACS) Annual Meeting, Boston, MA. Aug. Abst. #131. PUBLISHED
- Visscher, PT, C Dupraz, **AW Decho**, BP Burns. 2010. *Mechanisms of biomineralization in hypersaline and open marine microbial mats*. INTERNATIONAL ASSOCIATION OF SEDIMENTOLOGY (IAS), 18<sup>th</sup> International Sedimentological Congress Meeting, Mendoza, Spain (Abstr.#561) PUBL.
- Decho, AW**. et. al. *Using surface-functionalized nanoparticles as antibiotic delivery vehicles (ADVs) for penetrating biofilms: A sorptive sponge for nanoparticle accumulation under natural conditions*. 5<sup>th</sup> INTERNATIONAL CONFERENCE on ENVIRONMENTAL EFFECTS OF NANOPARTICLES, held August 22-26, 2010. Clemson, SC. PUBLISHED
- Decho, AW**. 2010. Overview of Biofilms, EPS, and quorum sensing and their links to sediment biogeochemical processes. AMERICAN SOCIETY LIMNOLOGY OCEANOGRAPHY (ASLO)-AGU Annual Meeting, held Portland, OR. February.
- Decho, AW**. *The biofilm way of life in marine systems*. AMERICAN SOCIETY OF MICROBIOLOGY (ASM) -SC Annual Chapter Meeting, held Charleston, SC. April.
- Frey R, **Decho AW**, Ferry JL. 2009. Correlation of the common water quality parameters pH, nitrate, phosphate, iron, total carbonate, and natural organic matter with multifactorial photodegradation. AMERICAN CHEMICAL SOCIETY (ACS) Annual Mtg abstract, vol. 237.
- Decho, AW**. *Biofilms: A sorptive sponge for nanoparticle accumulation under natural conditions*. 4<sup>th</sup> INTERNATIONAL CONFERENCE on ENVIRONMENTAL EFFECTS OF NANOPARTICLES, held September 6-9, 2009. Vienna, AUSTRIA.
- Shaw TJ, Ferry JL, Hexel CR, Craig PS, Murphy CJ, Patrick S, Frey R, Chandler GT, **Decho AW**, Pennington P, Fulton M. 2008. ENVR 32- Analysis of Au nanorods in samples from an estuarine mesocosm study. AMERICAN CHEMICAL SOCIETY (ACS) Annual Mtg, Vol 235.
- Ferry JL, Craig PS, Frey R, Hexel CR, Shaw TJ, Murphy CJ, Patrick S, **Decho AW**, Chandler GT, Pennington P, Fulton M. 2008. ENVR 52- Partitioning of Au nanorods in saline estuarine mesocosms. AMERICAN CHEMICAL SOCIETY (ACS) Annual Mtg, Vol 235.
- Frey, RL, PJ Pellechia, **AW Decho**, JL Ferry. 2008. *Stability and molecular fate of DPD/Autoinducer 2 as a function of environmental factors pH, boric acid, temperature, and salinity*. AMERICAN CHEMICAL SOCIETY (ACS) Annual Meeting, held Boston, MA.
- Dupraz C, Braissant O, Gallagher K, Glunk C, **Decho AW**, Visscher PT. 2008. The role of EPS properties and turnover in carbonate mineral nucleation. Joint Mtg of GEOLOGICAL SOCIETY OF AMERICA (GSA) and Soil Science Society of America.
- Decho, AW**, PT Visscher, RS Norman, J Ferry, PL Ferguson. 2008. *Geochemical Challenges to quorum sensing in natural microbial mats*. NASA ABSCICOM (Astrobiology) Meeting, Session 18, held Santa Clara Convention Ctr. Santa Clara, CA April 14-18, 2008.
- Bey, B., E. Biers, **AW Decho**, RS Norman. 2008. *Identifying quorum sensing activities in a hypersaline mat assemblage using a functional metagenomics approach*. AMERICAN SOCIETY OF MICROBIOLOGY (ASM) Annual Meeting, Philadelphia, PA. N-225.

- Bey, B., E. Biers, M. Uyaguari, **AW Decho**, RS Norman. *An Efficient methods for extraction of high molecular weight DNA from microbial mats*. AMERICAN SOCIETY OF MICROBIOLOGY (ASM) Annual Meeting. Philadelphia, PA. (#Q549). 2008.
- Visscher PT, Dupraz C, Braissant O, **Decho AW**. 2008. *The Role of EPS Properties and Turnover in Carbonate Mineral Nucleation*. AGU (Abstr. # 150670) Session: Biofilms and Biomineralization: Evidence from ancient and modern systems. AMERICAN GEOPHYSICAL UNION (AGU) Ann. Mtg. Houston, TX. Oct.
- Braissant O, Gallagher KL, **Decho AW**, Przekop KM, Glunk C, Dupraz C, Visscher PT. 2008. *Characteristics and Turnover of Exopolymeric Substances (EPS) in a hypersaline microbial mat: Implication for preservation of microbial biosignatures in the rock record*. 8th EUROPEAN WORKSHOP ON ASTROBIOLOGY (EANA), held Neuchatel, SWITZERLAND.
- Braissant O, **Decho AW**, Przekop KM, Gallagher KL, Glunk C, Dupraz C, Visscher PT. 2008. *Turnover of natural exopolymeric substances: Interactions with calcium in lithifying microbial mats*. INTERNATIONAL Kalkowsky SYMPOSIUM: GEOBIOLOGY OF STROMATOLITES, Goetingen, GERMANY.
- Visscher, PT, LK Baumgartner, C Dupraz, O Braissant, KM Przekop, JF Stolz, JR Spear, **AW Decho**. 2008. *Biogeochemistry and diversity of open marine stromatolites and hypersaline lithifying microbial mats*. NASA ABSCICOM (Astrobiology) Meeting, Session 18, held Santa Clara Convention Ctr. Santa Clara, CA, April 14-18.
- Dupraz C, Braissant O, Glunk C, **Decho AW**, Visscher PT. 2008. *Influence of the EPS matrix on microbialite formation*. NASA ABSCICOM (Astrobiology) Meeting, Session 18, Santa Clara, CA, April.
- Frey R, **Decho AW**, Ferry JL. 2008. *Correlation of the common water quality parameters pH, nitrate, phosphate, iron, total carbonate, and natural organic matter with the multifactorial photodegradation of n-octanoyl-dl-homoserine lactone*. Abst. #12343525. AMERICAN CHEMICAL SOCIETY (ACS) Annual Meeting, March.
- Norman RS, Bey B, Visscher PT, **Decho AW**. 2008. *A functional genomic approach to understanding quorum sensing in the delta-proteobacteria, Desulfovibrio sp.* AMERICAN SOCIETY OF MICROBIOLOGY (ASM) Annual Meeting, Boston, MA. (#52 A)
- Pearman WF, Angel SM, **Decho AW**. 2007. *Surface enhanced Raman spectroscopy (SERS) for in-situ measurements of signaling molecules (e.g. autoinducers) relevant to bacterial chemical communication- quorum sensing*. 34th Annual Conference of Federation of Analytical Chemistry and Spectroscopy (FACSS), Memphis, TN. October.
- Decho AW**, Norman RS, Visscher PT, Ferguson LP, Ferry J. 2007. *Quorum sensing in natural microbial mats: a biogeochemical challenge*. AMERICAN SOCIETY OF MICROBIOLOGY (ASM) Special Conference on "Cell-to-Cell Communication in Bacteria", October, Austin, TX.
- Decho AW**, Visscher PT, Norman RS, Kawaguchi T. 2007. *Microspatial Patterns and Chemical Communication between Bacteria in Microbial Mats*. AMERICAN SOCIETY OF MICROBIOLOGY (ASM) Special Conference on Microbial Biofilms, Quebec, Canada. March.
- Braissant O, Visscher PT, **Decho AW**. 2007. *Exopolymeric substances in hypersaline Microbial mats: their potential role in calcium carbonate mineral precipitation*. GEOLOGICAL SOCIETY OF AMERICA (GSA) Annual Meeting, Denver, CO October, Session 126: Perspectives in Redox Geochemistry and Microbial Processes (Vol. 39, No. 6)
- Braissant O, Przekop K, **Decho AW**, Verrecchia E, Dupraz C, Glunk C, Gallagher K, Visscher PT. 2007. *Sulfate reducing bacteria exopolymers: their influence on calcium carbonate mineral precipitation*. NASA ASTROBIOLOGY CONFERENCE (March) Vol. 6 (1): 247-285.
- Norman RS, Bey B, Visscher PT, **Decho AW**. 2007. *A functional genomic approach to understanding quorum sensing in the Delta Proteobacteria, Desulfovibrio sp.* AMERICAN

- SOCIETY OF MICROBIOLOGY (ASM) Special Conference -Microbial Biofilms, Quebec, Canada, Oct.
- Decho AW.** 2007. *Quorum sensing in natural microbial mats: a biogeochemical challenge.*  
AMERICAN SOCIETY OF MICROBIOLOGY (ASM) Special Conference on 'Cell-to-Cell Communication in Bacteria', October, Austin, TX.
- Decho AW.** 2007. *Microspatial Patterns and Chemical Communication between Bacteria in Microbial Mats.*  
AMERICAN SOCIETY OF MICROBIOLOGY (ASM) - Special Conference on Microbial Biofilms, Quebec, Canada.
- Braissant O, Przekop KM, **Decho AW**, Verrecchia EP, Dupraz C, Glunk C, Gallagher K, Visscher PT. 2006. *Exopolymers from sulfate-reducers: their role in precipitation of carbonate minerals,* Societe Geologique de France, Societe Francaise de mineralogie et crystallographie, Joint Earth Sciences Meeting, Dijon, France.
- Gallagher K, Przekop KM, Baumgartner LK, Carson E, Blackshear A, Braissant O, **Decho AW**, Vasconcelos C, McKenzie JA, Visscher PT. 2006. *Lithification in Microbial mats: The Role of the Sulfur Cycle.* CONFERENCE ON ASTROBIOLOGY SCIENCE. Washington, DC.
- Visscher PT, Dupraz C, Reid RP, Stolz JF, **Decho AW.** 2004. *Decoupling of coupled element cycles in early microbial ecosystems. Origin of biogenic signatures in the rock record?* Workshop on 'Microbialites and microbial communities in sedimentary systems'. Paris, France, (September). Published abstract in "*Microbialites et communautés microbiennes dans les systèmes sédimentaires.* G. Camoin and P Gautret (eds). Association des Sedimentologues Français (ASF), Societe Geologie de France, Paris, France, pp. 109-110 (ISBN0990-3925).
- Decho AW.** 2004. *Marine Stromatolites, the earth's earliest biofilms.* AMERICAN SOC. OF MICROBIOLOGY (ASM) Special Conference on 'Biofilms', Victoria, BC (November)
- Petrisor AI, Kawaguchi T, **Decho AW.** 2003. An introduction to bacterial geography. Proceed. 27<sup>th</sup> Ann. Congress of American-Romanian Academy of Arts and Sciences mtg.
- Reid RP; Visscher PT, **Decho AW**, Marinelli R, Stolz J. 2003. *Biocomplexity of Marine Stromatolites: Biogeochemical Cycling, Microbial Population Dynamics, and Mineral Formation in a Three Billion Year Old Ecosystem.* Biocomplexity PI meeting, Washington DC, Sept.
- Kawaguchi T, **Decho AW.** 2001. *The role of extracellular polymeric substances on CaCO<sub>3</sub> precipitation in marine stromatolites.* (Abstract # 768) AMERICAN SOCIETY OF LIMNOLOGY & OCEANOGRAPHY (ASLO), Albuquerque, NM. February.
- Hoskins DL, Stancyk SE, **Decho AW**, Lewis VP, Baynes J. 2001. Digestion of biofilm carbohydrates by the deposit-feeding brittlestar *Amphipholis gracillima* (Stimpson)(Ophiuroidea: Amphiuridae). Proceedings of the 10<sup>th</sup> International Conference, Dunedin, UK.
- Decho AW**, Kawaguchi T. 2000. "*Microbial Processes and Calcification in Marine Stromatolites: The Earth's Earliest Biofilms*" AMERICAN SOCIETY OF MICROBIOLOGY (ASM), Special Conference on Biofilms, Big Sky, Montana (July). (POSTER)
- Decho AW**, Kawaguchi T. 2000. "*In Situ Microspatial Imaging of Bacteria and EPS within Marine Sediments*" AMERICAN SOCIETY OF MICROBIOLOGY (ASM), Special Conference on Biofilms, held at Big Sky, Montana (July). (POSTER)
- Stolz J, Visscher PT, **Decho AW**, Reid RP. 2000. "*Community Structure in a Modern Marine Stromatolite*" INTERNATIONAL SYMPOSIUM ON PHOTOTROPHIC PROKARYOTES, Barcelona, SPAIN (August).
- Noble, PA., W Johnson, C Roper, M Kelly, M Hoffman, M Dantzler, S Thieben, ST Lindsay, H Dang, CR Lovell, **AW Decho**, J Tour, M Fletcher. 1999. Abstract #11434 Q-65; 98<sup>th</sup> AMERICAN SOCIETY OF MICROBIOLOGY (ASM), Atlanta, GA. (POSTER)
- Reid, RP, B. Bebout, **AW Decho**, IW MacIntyre, H. Paerl, J. Pinckney, L. Prufert-Bebout, T. Steppe, P. Visscher.

1999. "Microbial Heaven in a Fringing Reef Complex, Highborne Cay, Bahamas. (POSTER).
- Schlekat, C.E., K.E. Wommack, **AW Decho**, G.T. Chandler. 1998. *Phylogenetic Characterization of an Estuarine Bacterial isolate and Compositional Analysis of its metal binding* EPS. AMERICAN SOCIETY OF MICROBIOLOGY (ASM) Annual Meeting, Miami, FL. [POSTER]
- Varlik, B., **AW Decho**. 1998. *Effects of Polymer-transition metal interactions on the survival and bioavailability of pathogenic marine and freshwater bacteria in estuaries*. SOCIETY OF ENVIRONMENTAL TOXICOL. CHEM. (SETAC) Annual Mtg., Charlotte, NC. [POSTER]
- Schlekat, C.E., **AW. Decho**, G.T. Chandler. 1998. *Modelling uptake of Ag, Cd, and Zn by the estuarine amphipod *Leptocheirus plumulosus* from multiple uptake routes*. SOCIETY OF ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY (SETAC) Annual meeting, Charlotte, NC. [POSTER]
- Decho, AW**. 1997. *Localization of extracellular enzyme activities within microbial biofilms*. AMERICAN SOCIETY OF LIMNOLOGY AND OCEANOGRAPHY (ASLO) Annual Meeting. Santa Fe, NM (February).
- Schlekat, C.E., **A.W. Decho**, G.T. Chandler. 1997. *Role of microbial extracellular polymeric substances in the bioavailability of metals in surficial estuarine sediments*. INTERNATIONAL MEETING of SOCIETY OF ENVIRONMENTAL TOXICOLOGY CHEMISTRY (SETAC). Amsterdam, THE NETHERLANDS. April 1997.
- Reid, R.P., P. Visscher, J. Pinckney, H. Paerl, **AW. Decho**, B. Bebout, M. Feldmann, I. MacIntyre. 1997. *Microbial-mediated lithification in Bahamian Stromatolites*. INTERNATIONAL ASSOCIATION OF SEDIMENTOLOGISTS.- Workshop of Microbial Mediation of Carbonate Diagenesis. Chichilianne, FRANCE (Sept. 97)
- Reid, R.P., P. Visscher, J. Pinckney, H. Paerl, **AW. Decho**, B. Bebout, M. Feldmann, I. MacIntyre. 1997. *A geomicrobiological investigation of modern marine stromatolites at Highborne Cay, Bahamas*. INTERNATIONAL GEOLOGICAL CORRELATION PROGRAM (IGCP) 380: Microbialites- Processes and Products, Cracow, POLAND. (Sept)
- Reid, R.P., J. Pinckney, P. Visscher, H. Paerl, **AW. Decho**, B. Bebout, M. Feldmann, I. MacIntyre. 1997. *Microbial-mediated lithification of cyanobacterial mats forming modern marine stromatolites in the Bahamas*. 97<sup>th</sup> Annual Meeting, AMERICAN SOCIETY OF MICROBIOLOGY (ASM), Miami, FL (Session N-77, p. 394)
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- Decho AW**. 1995. *Modifications in digestive processing strategies to reduce toxic trace metal uptake in a marine bivalve*. Benthic Ecology Meetings, Rutgers University, NJ.
- Schlekat CE, **Decho AW**, Chandler GT. 1995. Sorption of organic compounds to microbial extracellular polymers: potential vector for bioaccumulation of sediment-associated contaminants. SETAC (Society of Environ. Toxicol. Chem) Mtg. Pensacola, FL.
- Decho AW**, Luoma SN. 1994. Modification in digestive processing strategies to reduce toxic trace metal uptake in a marine bivalve. SETAC (Society of Environ. Toxicol. Chem) Mtg. Pensacola, FL.
- Decho AW**. 1993. "Microbial Extracellular Polymers in Benthic Food Webs." American Soc. of Microbiology Annual Meeting, Atlanta, GA.
- Luoma SN, Fisher N, **Decho AW**, Griscom S, Brown C, Wang W, 1993. Bioavailability of cadmium from particulate sources to bivalves. 14<sup>th</sup> Annual Mtg (SETAC)- Ecological Risk Assessment.
- Decho AW**, Luoma SN. 1992. Geopolymers (humic and fluvic acids): sink trophic transfer-vehicle for metals to bivalves. 13<sup>th</sup> Annual Mtg Society for Environ. Toxicology and Chemistry (SETAC). Seattle, WA.
- Decho AW**, Luoma SN. 1990. Mucus-exopolymer utilization by two bivalves with different feeding strategies. American Geophysical Union Annual Mtg. EOS Transactions 71, CONF-9002174.

## VISITING RESEARCHER

- 2014 Pacific Northwest National Laboratories (PNNL)**, Richland, Washington (2 wks)  
**2013 Scottish Oceans Institute (SOI)**, University of St. Andrews, **SCOTLAND** (4 mos)  
**1995-2012 Bahamas** (Caribbean Marine Research Center (CMRC) at Lee Stocking Island; Highborne Cay; San Salvador Island) to conduct NSF-sponsored research on marine microbial communities.  
**1996 Digital Instruments, Inc., Santa Barbara, CA** to conduct biofilm research using atomic-force microscopy. (2 wks)  
**1991 Catalina Island Marine Science Center**, (Univ. Southern California) for Intensive 6-week techniques course called 'Molecular Biology & Biochemistry of Marine Organisms', sponsored by Office of Naval Research and USC. (6 wks)  
**1989 US Geological Survey, Menlo Park, CA.** Post-doctoral work on bioavailability of metals to marine animals. (5 yrs)  
**1987-88 CSIRO Marine Laboratories, Brisbane, AUSTRALIA.** Post-doctoral work to examine trophic availability of microbial EPS to marine consumer animals. (1 yr)  
**1986 University of Alaska-Juneau.** Research associate for Dr. T. Shirley for study entitled "Association of Primary Productivity & Recruitment in Subarctic Ecosystems" (APPRISE) investigating benthic-pelagic coupling processes. (2 mo)  
**1983 Marine Biological Laboratory, Woods Hole, Mass.,** Summer fellowship for graduate 'Microbial Ecology course and research at MBL. (10 wks)  
**1980 Duke University Marine Laboratory.** Summer course "Marine Ecology", and research via H. Roy Wilson Fellowship (Ohio University) (10 wks)  
**1978 Bermuda Biological Station for Research.** Summer course in Oceanic Island Ecology via scholarship Award (Eastern Conn. State Univ.) (3 wks)

## MEMBER:

- 2014-present AAAS** (American Association for Advancement of Science)  
**2013-present ASPPH** (Association of Schools and Programs of Public Health)  
**2013-present APHA** (American Public Health Association)  
**2008-present. Australian Centre for Astrobiology-** Assoc. Member; nominated by Dr. Brendan Burns (Australian Centre for Astrobiol., Univ. New South Wales, Sydney, Australia)

**SERVICE:** Some Examples of Service Served.

## University

- *VPR Committee on University Research Core Facilities. 2022-present*
- *VPR Committee on University Research Space Utilization. 2022-present*
- *Provost's Dean Search Committee for Library Science. 2022-2023.*
- *Provost Committee on University Research Space Utilization. 2020-2022*
- *Provost Committee Evaluation of ASPH Dean – 2013-2014*
- *CHAIR, Search Committee for USC SMART-STATE Professorship in Environ NanoScience and Risk Assessment; (2010-2011)*
- *CHAIR, USC Faculty Grievance Committee; (2007-2010)*
- Member, 'USC Educational Foundation Research Award for Health Sciences' Committee 2010-2013.

- Marine Sciences Associate Faculty and Graduate Committee; (1995-2007)
- School of the Environment Faculty Search Committee; (2010)
- ASPH Dean Search Committee; (2010)

### **Arnold School of Public Health (ASPH)**

- *ASSOCIATE DEAN for RESEARCH*, Oct 2014-present;
- *CHAIR*, Research Advisory Committee.
- *CHAIR*, Tenure and Promotions Committee (2007-2010);
- *CHAIR*, ASPH Research Awards;
- Member Tenure and Promotions Committee (1998-present)
- Curriculum Committee Member;
- Research Faculty Evaluation Committee;
- Teaching Peer-Reviewer;
- Post-Tenure Review Committee;
- Information Technology and Resources Committee (2009-2012);

### **Department**

- Director of Graduate Studies; (2011-present)
- Associate Chair; (2010-present)
- *CHAIR*, New Faculty Search Committee 1, (2008-2009)
- *CHAIR*, New Faculty Search Committee 2, (2010-2011)
- *CHAIR*, New Faculty Search Committee 3, (2011-2012)
- *CHAIR*, New Faculty Search Committee 4, (2011-2012)