

## The Richard Olsen Lecture Series



The Olsen Lectures in Chemistry were established by Richard K Olsen, a respected teacher and researcher, who spent most of his professional career as a faculty member in the Department of Chemistry & Biochemistry of Utah State University. The Lectureship is in honor of the memory of his parents, Kenneth Beal & Sarah Young Olsen, and is in appreciation to the Department for the opportunity to realize the goal of serving as a University professor.

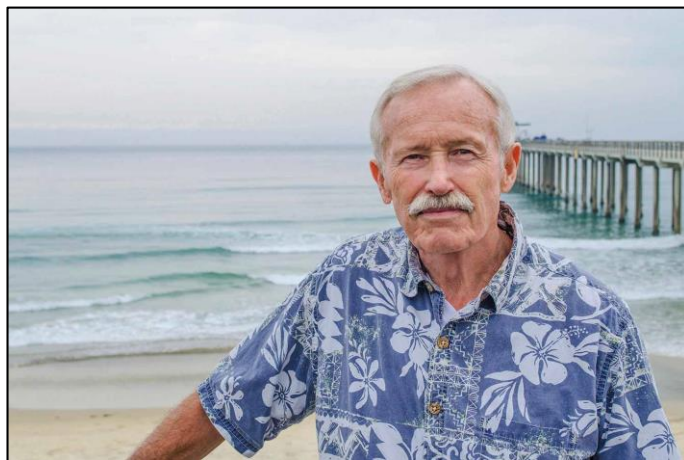
Dr. Olsen was born in Provo, UT in 1935. He attended Brigham Young University where he earned his BS in chemistry in 1960. He then went on to graduate school at the University of Illinois, obtaining a doctorate in 1964. During his graduate studies, Dr. Olsen was a National Science Foundation Fellow and a Public Health Service Fellow. Next on his agenda was postdoctoral research at the Stanford Research Institute and the University of Utah.

Dr. Olsen began his faculty appointment as Assistant Professor at Utah State University in 1967. He quickly rose up through the ranks, first to Associate Professor (1970) and then to full Professor (1978). His research interests focused on synthesis of peptide antibiotics and novel amino acids. He has been the recipient of numerous research grants from prestigious agencies such as the National Institutes of Health. During his time at Utah State, Dr. Olsen mentored 19 PhD and MS students, as well as a dozen postdoctoral fellows. He authored nearly 60 articles in peer-reviewed journals and wrote four review articles.

Dr. Olsen is fondly remembered by many students who took his organic chemistry class. Even in retirement, he has volunteered to serve as a tutor and mentor to students enrolled in this course. Since retirement, Dr. Olsen has developed his interest in fine art, and has become one of the prominent artists in the area. His paintings have appeared in a number of shows in the Valley. He was kind enough to donate some of his work to the Department, where it is proudly displayed in the Library. Richard is married to LaVina; together they have five children.

## The Richard Olsen Lecture Series

2020-2021 Lecturer



### William Fenical

Distinguished Professor of  
Oceanography and Pharmaceutical  
Science  
Center for Marine Biotechnology and  
Biomedicine

Scripps Institution of Oceanography

**“Marine Bacteria Provide New  
Opportunities in Drug Discovery”**

Wednesday, January 27, 2021  
4:00-5:00 pm (MST)

Zoom Link:

[https://usu-edu.zoom.us/j/85397449709?  
pwd=Zk92M1R1cEtnUUJqSTFYLOhBR0d5dz09](https://usu-edu.zoom.us/j/85397449709?pwd=Zk92M1R1cEtnUUJqSTFYLOhBR0d5dz09)

Meeting ID: 853 9744 9709

Passcode: B+03\*J



## Biographical Sketch

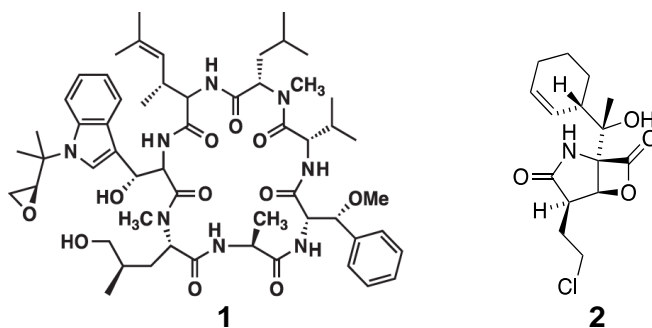
Born in Chicago, Dr. Fenical received a B.S. from California State Polytechnic University, an M.S. from San Jose State University, and a Ph.D. in organic chemistry from UC Riverside. His dissertation title was, "Electrocyclic Reactions of Polycyclic Polyolefins." Prior to joining Scripps as a marine research chemist, He taught at San Jose State University, University of California Riverside, and San Bernardino Valley College. He also spent one year as a research scientist for Shell Development Company.

Dr. Fenical's research focuses on the isolation and identification of chemical materials from marine plants, animals, and microorganisms that may have potential pharmaceutical or agricultural uses. He is also interested in how naturally produced chemical compounds affect the ecology of tropical marine ecosystems.

Dr. Fenical's early work at Scripps Institution of Oceanography helped chemists recognize marine algae and invertebrates as prolific producers of interesting natural products. His 1982 *Science* article, entitled "Natural Products Chemistry in the Marine Environment" identified marine organisms as having biosynthetic pathways that are unique, as compared to terrestrial organisms.<sup>1</sup> As a result of an early focus on invertebrates, he discovered a new anti-inflammatory drug derived from a soft coral. This drug, pseudopterosin, is currently used in skin creams and is in line for development for the treatment of human skin diseases.<sup>2</sup>

In the late 1990's, Dr. Fenical pioneered the investigation of marine microorganisms as potential sources of novel bioactive molecules. Notable examples include cyclomarin (**1**), a heptapeptide, which is currently of interest for its anti-*Mycobacterium tuberculosis* activity via a novel mechanism of action,<sup>3</sup> and salinosporamide A (**2**), a proteasome inhibitor, currently in phase III trials on patients with relapsed multiple myeloma.<sup>4</sup> Salinosporamide A is produced by *Salinispora tropica*, a member of a novel genus of marine actinomycetes. More recently, he reported the structures of the salinipeptins, which are unusual peptides produced by a *Streptomyces* sp cultured

from the Great Salt Lake.<sup>5</sup>



Among many awards, he has received the Paul Scheuer Award in marine natural products chemistry, the Ernest Guenther Award in the Chemistry of Natural Products from the American Chemical Society, the American Society of Pharmacognosy's Norman R. Farnsworth Research Achievement Award, and has received the National Cancer Institute's highly respected Merit Award for his discovery of the production of new antibiotics and antitumor agents by deep ocean sediment bacteria.

Dr. Fenical's research accomplishments are the result of many collaborations. He has mentored over 40 graduate students and 80 postdoctoral researchers. His research has led to the publication of more than 460 scientific articles on marine chemistry research.

## Abstract

Over the past 15 years, truly marine bacteria have been recognized as a new resource for the discovery of new drug candidates. While once considered uncultivable, using new methods has allowed many never seen before taxa to be cultivated. As time has passed, new genomic tools have been applied to marine bacteria. These tools are being carefully evaluated to make the full absolute configurations of complex molecules assigned. In biosynthetic gene clusters, the stereospecificity of enzymes are now well known and can form the foundation of structure assignments. Given the fact that deep ocean sediments harbor one billion largely unknown microbes per cubic centimeter, the future of marine microbial studies is highly promising.

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2. Look, S.A.; Fenical, W.; Matsumoto, G.K.; Clardy, J. *J. Org. Chem.* **1986**, *51*, 5140-5145.
3. Renner, M.K.; Shen, Y.C.; Cheng, X.C.; Jensen, P.R.; Frankmoelle, W.; Lobkovsky, E.; Clardy, J. *J. Amer. Chem. Soc.* **1999**, *121*,

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4. Feling, R.H.; Buchanan, G.O.; Mincer, T.J.; Kauffman, C.A.; Jensen, P.R.; Fenical, W. *Angew. Chem.* **2003**, *115*, 369-371.
5. Shang, Z.; Winters, J.M.; Kauffman, C.A.; Yang, I.; Fenical, W. *ACS Chem. Biol.* **2019**, *14*, 415-425.