

UNIVERSITY OF RHODE ISLAND
Department of Chemistry
SEMINAR

3:00 P.M., Monday, November 27, 2023
Room 105 – Beupre Center

Prof. Jonathan L. Sessler

The University of Texas at Austin

Texas-Inspired Drug Discovery
Efforts

HOST

Fang Wang
Department of Chemistry
401-874-4243

TEXAS-INSPIRED DRUG DISCOVERY EFFORTS

Jonathan L. Sessler

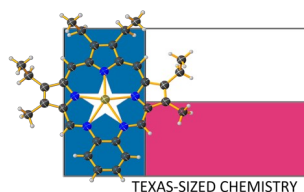
The University of Texas at Austin

This lecture will present the development of expanded porphyrins as potential drug leads. The presentation will begin with a personal story of a 3x cancer survivor and how with the assistance of great coworkers and collaborators an effort has been made to fight back against this disease by studying the chemistry and anti-cancer biology of gadolinium(III) texaphyrins.

Texaphyrins were the first of the so-called expanded porphyrins--larger analogues of heme pigments--to stabilize a 1:1 complex with a metal cation. Subsequently, and continuing as a focus today, an effort has been made in our laboratories and those of many others to create additional expanded porphyrins. Hundreds are now known. Several from our laboratory have proved useful at stabilizing actinide cation complexes.

Recently, efforts have been made to create so-called immunogenic cell death promoters designed to prevent cancer recurrence based on redox-active gold(I) carbenes. An introduction to this new research direction will be included in this lecture, as well new work involving the development of expanded porphyrins and ExJade as ligands for the lanthanides and actinides.

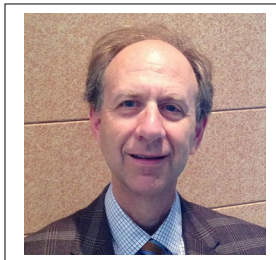
Collaborations with a number of groups, including those of Profs. Dongho Kim, Andrew Gaunt, John Arnold, Stosh Kozimer, Jong Sung Kim, Shunichi Fukuzumi, T.K. Chandrashekar, Dirk Guldi, Changhee Lee, Jan Jeppesen, Steffen Bähring, Zahid Siddik, Rick Finch, Zhengrong Cui, Dani Gibson, Zhao-Xi Wang, Zhan Zhang, Chuanhu Lei, Hongyu Wang, Xiaofan Ji, Xiaodong Chi, Han-Yuan Gong, and Tomas Torres, are gratefully acknowledged. Special thanks also go to Jonathan F. Arambula, Gregory Thiabaud, Sajal Sen, Qing He, Xian-sheng Ke, Atanu Jana, James Brewster, and Daniel Mangel. Early funding came from the US NIH and the CPRIT, with current support provided by InnovoTEX, Inc. and the Robert A. Welch Foundation.



References

1. Sessler, J. L.; Murai, T.; Lynch, V.; Cyr, M. *J. Am. Chem. Soc.* **1988**, *110*, 5586-5588.
2. Brewster, J. T. II, Mangel, D. N.; Gaunt, A. J.; Saunder, D. P.; Zafa, H.; Lynch, V. M.; Boreen, M. A.; Garner, M. E.; Goodwin, C. A. P.; Settineri, N. S.; Arnold, J.; Sessler, J. L. *J. Am. Chem. Soc.* **2019**, *141*, 17867.
3. Thiabaud, G.; He, G.; Sen, S.; Shelton, K. A.; Baze, W. B.; Segura, L.; Alaniz, J.; Macias, R. M.; Lyness, G.; Watts, A. B.; Kim, H. M.; Lee, H.; Cho, M. Y.; Hong, K. S.; Finch, R.; Siddik, Z. H.; Arambula, J. F.; Sessler, J. L. *Proc. Natl. Acad. Sci. USA* **2020** *117*, 7021.
4. Sen, S.; Hufnagel, S.; Maier, E. Y.; Aguilar, I.; Jayaraman, S.; DeVore, J. E.; Lynch, V. M.; Aramugam, K.; Cui, Z.; Sessler, J. L.; Arambula, J. F. *J. Am. Chem. Soc.* **2020**, *142*, 20536.
5. Chen, J.; Sedgwick, A. C.; Sen, S.; Ren, Y.; Sun, Q.; Chau, C.; Arambula, J. F.; Sarma, T.; Song, L.; Sessler, J. L.; Liu, C. *Chem. Sci.* **2021**, *12*, 9916.

Biography



Prof. Jonathan L. Sessler was born in Urbana, Illinois, USA on May 20, 1956. He received a B.S. degree (with Highest Honors) in chemistry in 1977 from the University of California, Berkeley. He obtained a Ph.D. in organic chemistry from Stanford University in 1982 (supervisor: Professor James P. Collman). He was a NSF-CNRS and NSF-NATO Postdoctoral Fellow with Professor Jean-Marie Lehn at L'Université Louis Pasteur de Strasbourg, France. He was then a JSPS Visiting Scientist in Professor Tabushi's group in Kyoto, Japan. In September, 1984 he accepted a position as Assistant Professor of Chemistry at the University of Texas at Austin, where he is currently the Doherty-Welch Chair. Dr. Sessler has authored or coauthored over 900 research publications, written two books (with Dr. Steven J. Weighorn and Drs. Philip A. Gale and Won-Seob Cho, respectively), edited two others (with Drs. Susan Doctrow, Tom McMurry, and Stephen J. Lippard, Placido Neri and Mei-Xiang Wang), and been an inventor of record on over 90 issued U.S. Patents. To date, Dr. Sessler's work has been featured on more than 50 journal or book covers. His current WoS H-index is 118. From 2008-2019 Dr. Sessler served as an Associate Editor for *ChemComm*. Dr. Sessler was a co-founder (with Dr. Richard A. Miller) of Pharmacyclics, Inc., which was acquired by AbbVie for \$21B in 2015. His texaphyrin technology is now the basis for a new company, InnovoTex, Inc. Dr. Sessler has served as the co-organizer of several international conferences in porphyrin, supramolecular, and macrocyclic chemistry, and numerous American Chemical Society symposia. In addition to English, he speaks French reasonably well, as well as Hebrew and Spanish, and knows a little bit of German and Japanese, and a couple words of Korean. Dr. Sessler's work has been recognized with several awards, including the American Chemical Society Cope Scholar Award, the Royal Society of Chemistry Centenary Prize, the Southwest Regional American Chemical Society Award, the Molecular Sensors-Molecular Logic Gates Award, the CASE award, and the Hans Fischer Award. He is a member of the U.S. National Academy of Inventors and was named Inventor of the Year at The Univ. of Texas at Austin in 2016. Dr. Sessler received the 2018 Thomas Dougherty Award in Photodynamic Therapy from the Society of Porphyrins and Phthalocyanines. In 2019, he received the C. David Gutsche Award in Calixarene Chemistry and the Foreign Associate Award of the Asian Society for Porphyrins and Phthalocyanines. Dr. Sessler was elected a member of the European Academy of Sciences in 2019. That same year he was named The University of Texas Co-op Career Research awardee, which is the highest prize given for research at his home institution. In 2020 he received a Pioneer Award from The American Institute of Chemists and in 2021 he received the Ronald Breslow Award in Biomimetic Chemistry from the American Chemical Society. Dr. Sessler is a Fellow of the American Chemical Society, the Royal Chemical Society, and of the American Association for the Advancement of Science. He was elected to the US National Academy of Sciences in April of 2021 and the American Academy of Arts and Sciences in April of 2022. He received both the Mond-Nyholm and MASC Supramolecular Chemistry awards from the Royal Society of Chemistry that same year. He was just named the 2024 Stoddart Science Fund Chemist Awardee.