הפקולטה לכימיה ע"ש שוליך
טכניון – מכון טכנולוגי לישראל

Faculty of Chemistry
SCHULICH
Technion, Israel Institute of Technology

Organic and Inorganic Chemistry Seminar Series

Guest Seminar

Monday, May 11th at 11:30 in Hall 1

Prof. Michael Meijler

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Ben-Gurion University of the Negev

Seminar title:

The Chemistry of Love and Peace: Synthetic Probes to Unravel Mechanisms of Coexistence Within Human and Plant Microbiomes

The Chemistry of Love and Peace: Synthetic Probes to Unravel Mechanisms of Coexistence Within Human and Plant Microbiomes

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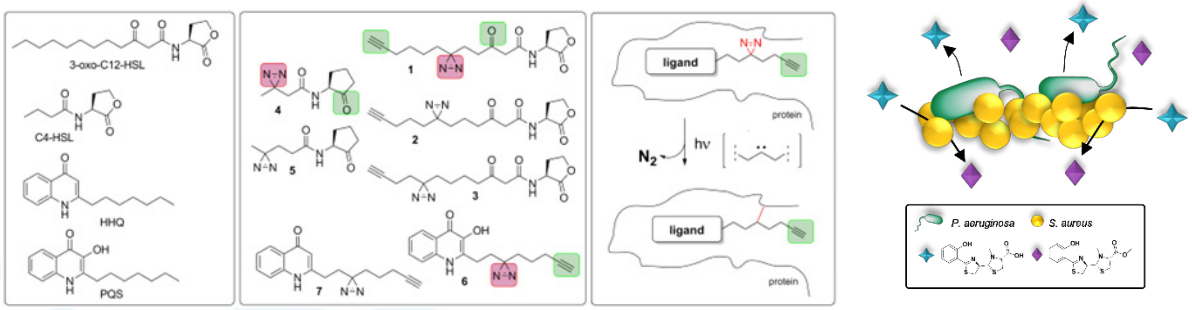
Life on earth is heavily based on chemical communication between cells. This enables unicellular and multicelular organisms to coordinate their behavior and function in such a way that they can adapt to changing environments and compete, as well as coexist, with other organisms. Prime examples of this phenomenon are displayed by the opportunistic pathogens *Pseudomonas aeruginosa* and *Staphylococcus aureus*, which can cause disease in humans – but most often ***do not***. In recent years we embarked on a quest to unravel questions regarding coexistence, based on chemical signaling. The Meijler group is targeting and examining signaling within and between various pathogens with several chemical tools, such as a set of **electrophilic** and **photoactivatable** 'tag-free' **probes** that are designed to bind QS receptors covalently. These probes are used as molecular tools to obtain new insights into the mechanisms of activation, deactivation and recognition of bacterial quorum sensing. Diverse species, including eukaryotes, have been found to react strongly to the presence of these compounds, and the recognition of QSMs is mediated by mostly unknown receptors. Recently we identified and validated the role of a human receptor for HSLs, called the Major Vault Protein (MVP), as an important immunomodulator, and we also identified new receptors for QSMs in other species. We also recently identified an exciting new mode of coexistence between bacterial pathogens using **untargeted metabolomics** and synthetic confrmation, and we are developing new molecular probes to capture and identify the unknown receptors that mediate these seminal events.



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2) S. Uzi-Gavrilov, Z. Tik, O. Sabti, M. M. Meijler: Chemical Modification of a Bacterial Siderophore by a Competitor in Dual-Species Biofilms. *Angew. Chem. Int. Ed.*, 135 (29), **2023**.

3) J. Rayo, R. Gregor, N. T. Jacob, et al, V. V. Kravchenko, M. M. Meijler: Immunoediting Role for Major Vault Protein in Apoptotic Signaling Induced by bacterial N-Acyl Homoserine Lactones. *Proc. Natl. Acad. Sci. USA*, 118 (12), **2021.**

4) A. Yashkin, J. Rayo, L. Grimes, M. Welch, M. M. Meijler: Short-Chain Reactive Probes to Unravel the Pseudomonas Aeruginosa Quorum Sensing Regulon. *Chem. Sci.*, 12 (12), 4570-4581, **2021.**