הפקולטה לכימיה ע"ש שוליך
טכניון – מכון טכנולוגי לישראל

Faculty of Chemistry
SCHULICH
Technion, Israel Institute of Technology

המעבדה לכימיה אורגנית ואי-אורגנית

סמינר

יום ב', 09.01.2023 בשעה 11:30, באולם כימיה 1

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בנושא:

Chemoselective Reactions for Late-Stage Skeletal Editing and Molecular Sensing

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Chemoselective Reactions for Late-Stage Skeletal Editing and Molecular Sensing

Dr. Ori Green, Laboratory for Organic Chemistry, ETH Zurich

Synthetic organic chemistry plays a crucial role in developing advanced technologies that benefit society, from large-scale manufacturing to individualized healthcare. In this lecture, I describe approaches for leveraging chemical design and synthetic strategies to address challenges in drug discovery and live-cell images.

In the first part of the talk, I discuss an unusual methodology to insert a nitrogen atom into the core skeleton of indoles to afford quinazolines.[1] The compatibility of the reaction with many common functional groups makes it a promising route for making various types of quinazolines, which are relevant pharmaceutically targets. Thus, the methodology was applied in the context of late-stage skeletal editing of several commercial drugs, clearly highlighting the reaction's broad potential for drug discovery.

In the second part of the talk, I describe the design and synthesis of a new chemical-responsive trigger that recognizes CO_2 with exquisite selectivity.[2] Based on this discovery, a large family of selective fluorescent CO_2 sensors was designed, synthesized, and evaluated. The modularity in reactivity and optical properties of these molecular sensors allows their use in a broad spectrum of multidisciplinary applications, including gas mixtures sensing, chemical reaction monitoring, and enzymatic inhibition assays. Notably, these sensors were compatible with biological systems and could be used in live-cell imaging.

References

1) "*Late-stage diversification of indole skeletons through nitrogen atom insertion.*"
Julia C. Reisenbauer[¥], Ori Green[¥], Allegra Franchino, Patrick Finkelstein, Bill Morandi*
Science, **2022**, 377, 1104-1109.

2) "*Activity-Based Approach for Selective Molecular CO_2 Sensing.*"
Ori Green[¥], Patrick Finkelstein[¥], Miguel A. Rivero-Crespo, Marius D. R. Lutz, Michael K. Bogdos, Michael Burger, Jean-Christophe Leroux, Bill Morandi*
J. Am. Chem. Soc. **2022**, 144, 8717-8724.