



The long island subsection
OF
The New York American chemical society
Proudly presents

Dr. Junior Gonzales,

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Title of Talk: “A Facile Synthesis of Porphyrinoid Scaffolds using Dipolar Cycloadditions”

Synopsis: De novo chlorin synthesis can be quite challenging to achieve in good yields and many chlorins are not stable to photobleaching and/or are readily oxidized, this has limit the use of these porphyrinoids in clinical research and care. Exploitation of chlorins also depends on the availability of these chromophores, to produce valuable data in the trials for photodynamic therapy and as nano-carriers for drug delivery. The reduced symmetry of the chlorin macrocycle further complicates the addition of the exocyclic motifs. A facile approach to a stable, synthetic chlorin with a fused N-methyl pyrrolidine uses a sarcosine-based azomethine ylide and cyclo addition on 5, 10, 15, 20-tetrakis-(2, 3, 4, 5, 6-pentafluorophenyl)-porphyrin (TPPF20) is increasingly used, but this approach has limitations. We report the divergent synthesis of chlorin scaffolds starting with the same TPPF20 using a glycine-based ylide. Unexpectedly, we found that careful control of the 1,3-dipolar cycloaddition reaction allows directed formation of new chlorins, including the fused N-H pyrrolidine, two dimers, and the same N-methyl chlorin product from the sarcosine ylide reaction. The mechanism begins with the formation of an alcoholic glycine, which then reacts with TPPF20 to form a key N-(hydroxymethyl)-17, 18-pyrrolidinyl-chlorin intermediate. Deformylation of this intermediate affords the N-H pyrrolidine, whereas a Cannizzaro-type of reaction promotes a hydride attack to an imine chlorin cation to yield the same N-methyl chlorin as the sarcosine ylide. The exocyclic NH-pyrrolidine provides a unique hemisphere-mode of attaching chiral moieties that avoids formation of diastereomers at the bridging carbons. The mechanism also unfolds a new route to furnish a hemiaminal chlorin and (N-carbaldehyde)-17, 18-pyrrolidinyl-chlorin).

All are welcome!

When: Thursday, March 1st, 2018

Where: Queensborough Community College, Science Building Rm S-112

Time: 5:30 p.m. – Social w/ Light Refreshments; 6:00 pm – Seminar Start

Directions: <http://www.qcc.cuny.edu/about/driving.html>

After Seminar Dinner: At a nearby restaurant, \$25 per person.



American Chemical Society Long Island Subsection
http://www.newyorkacs.org/sub_island.php