ACS Local Section
Southern Nevada

American Chemical Society (ACS) Symposium Friday, January 31, 2020
Hosted at UNLV in the Science and Engineering Building, Room 1311
5:00-5:30 PM Refreshments
5:30-6:30 PM Seminar

Chemical Evolution of the Tetracyclines and the Synthesis of Nuzyra and Seysara Against Infectious Diseases and Inflammation

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Abstract

Tetracyclines have been used in medicine since the late 1940's as antibiotics against infectious diseases and have evolved since then by the application of newer and more modern chemistries to afford more potent derivatives. Dr. Nelson began by modifying the chemical structure semi-synthetically, first to inhibit resistance mechanisms, then to afford more potent derivates against antibiotic resistant bacteria. By applying more modern reagents to the tetracycline scaffold, we were able to generate derivatives with increased potency as antibiotics. This work resulted in the formation of Paratek Pharmaceuticals (Nasdaq PRTK) and the generation of 2 clinical candidates, which were recently approved by the FDA as Nuzyra and Seysara, novel antibiotics for use against resistant pathogens in skin and pneumonia, and as dermatological agents against severe acne. The future of tetracyclines will be furthered as they are brought to use to treat inflammation and neurodegeneration caused by dysfunctional processes in these

Biosketch

Dr. Mark Nelson received a BS in Chemistry and Microbiology, Gannon University, Erie, PA, received a PhD in Medicinal Chemistry and Molecular Pharmacology from Temple University, Schools of Medicine and Pharmacy and Department of Chemistry, followed by a post-doctoral appointment at Tufts University School of Medicine, and was funded by Pfizer until 1995 as Assistant Professor. In 1996 he started Paratek Pharmaceuticals, which led collaborations with GSK, Bayer, Merck and Novartis, where as Senior of Director of Chemistry, generated over 3000 derivatives of the tetracyclines resulting in Nuzyra and Seysara, approved by the FDA in October 2018. Anti-inflammatory uses of the tetracyclines and against parasites resulted in collaborations with Merck Serono, UCSF and the Families of SMA, where non-antibiotic tetracyclines were found active against multiple sclerosis, malaria and Wolbachia infections and against spinal muscular atrophy. From this work Nelson has generated over 40 patents. Dr. Nelson has been awarded a Fulbright Lectureship Fellow Award (Cairo, Egypt), a Wellcome Trust Fellowship, Distinguished Alumni Award (Gannon), and in 2019 received the ACS Heroes of Chemistry Award.

The Southern Nevada Section of the ACS would like to extend a special thank you to Mohamed Dahroug and Josh Monk for their work in organizing this event.