

IIP at the University of Queensland's Institute for Molecular Bioscience

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Brisbane, Australia

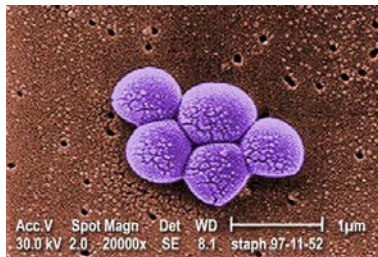
- While I cannot disclose the intimate details and results of the project I was working on, I can relay the information in the following slides.
- The project was pure organic synthesis. Nearly 95% of my time was spent in the lab setting up reactions, running reactions, monitoring reactions, analyzing spectral data, and purifying the product of each step.
- Essentially it was like organic chemistry lab, but I was the one in charge of writing the procedure based on what I thought would work best given the reagents I chose to use.

Me and my hood

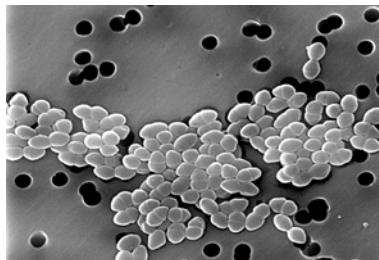


Step-wise Synthesis of Analogues of MCC6965

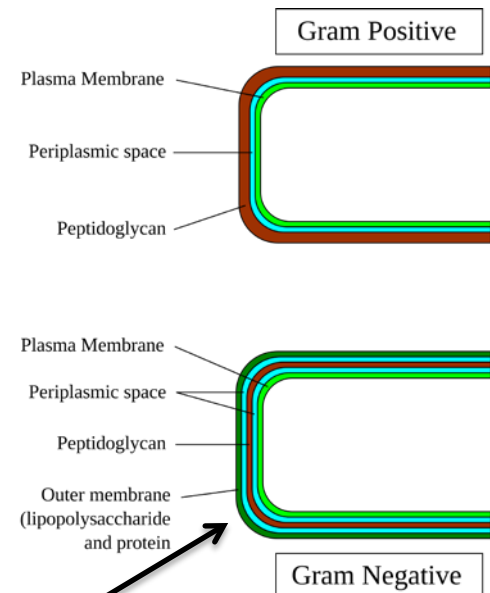
Candidates for Novel Antibiotics Effective against
Gram-positive Bacteria



MRSA



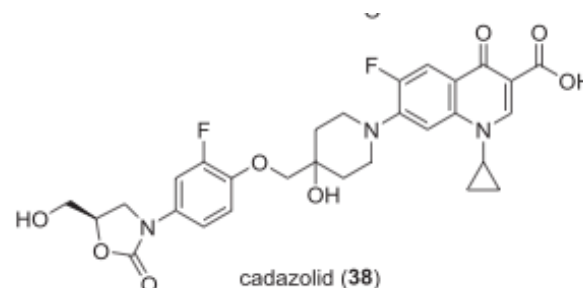
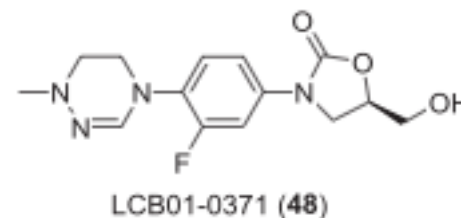
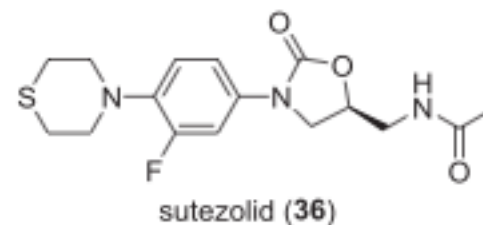
VRE



Impermeable barrier for
many small molecules
(porins serve as the
major entry gates)

Yash Patel
Karl Hansford
Matthew Cooper

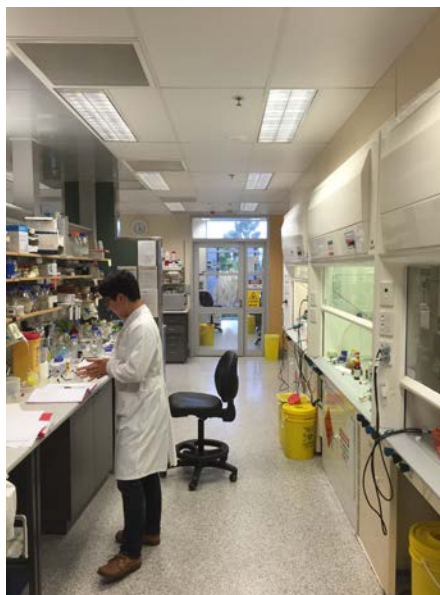
- Higher average molecular weights when compared to drugs outside the antibiotic grouping
- Less polar when compared to antibiotics effective against Gram-negative bacteria
- Less restriction in molecular weight, especially when testing for oral bioavailability

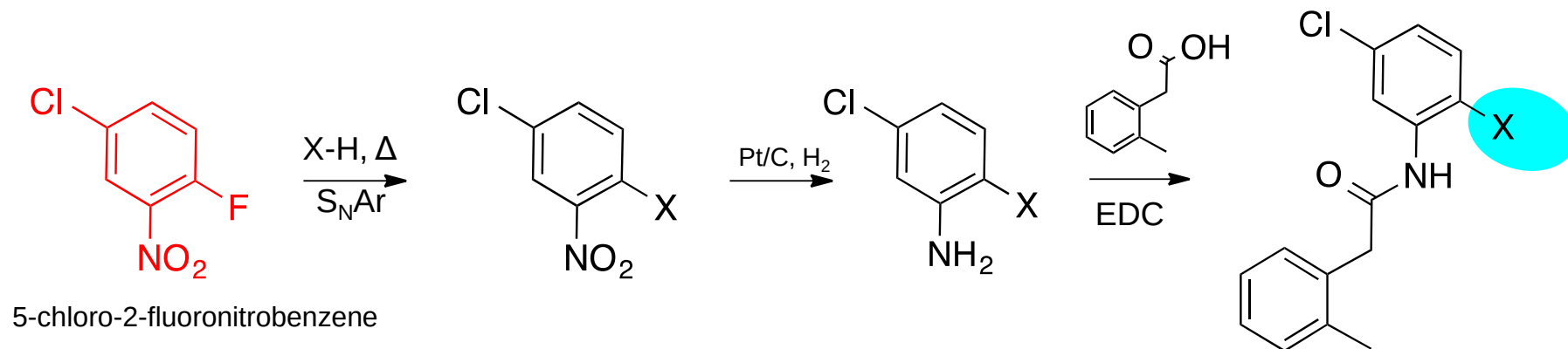


oxazolidinones

O'Shea, Rosemarie, and Heinz E. Moser. "Physicochemical Properties of Antibacterial Compounds: Implications for Drug Discovery." *J. Med. Chem. Journal of Medicinal Chemistry* 51.10 (2008): 2871-878. Print.

Butler, Mark S., Mark A. Blaskovich, and Matthew A. Cooper. "Antibiotics in the Clinical Pipeline in 2013." *The Journal of Antibiotics* 66 (2013): 571-91. Japan Antibiotics Research Association, 4 Sept. 2013. Web.

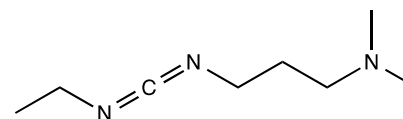
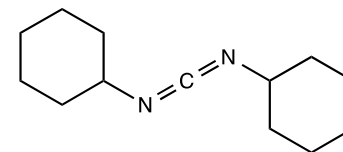
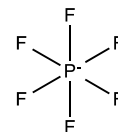
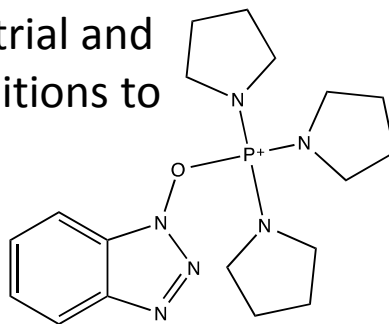
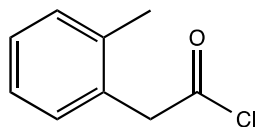
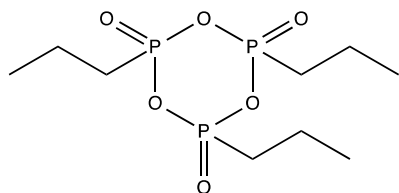




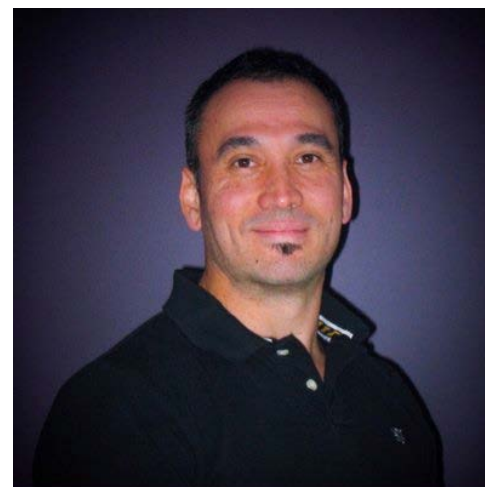
- Between every step, it was necessary to determine if the desired product was actually made, and, if so, proceed on to purification either by recrystallization or flash chromatography.

Problems Along the Way

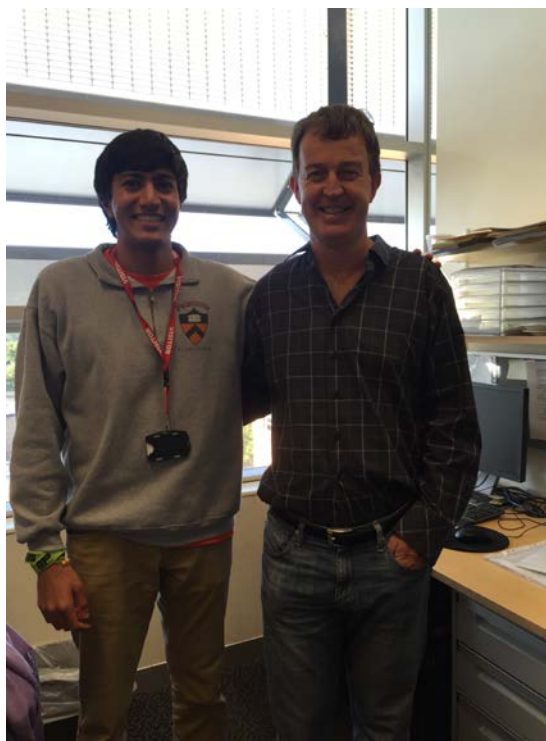
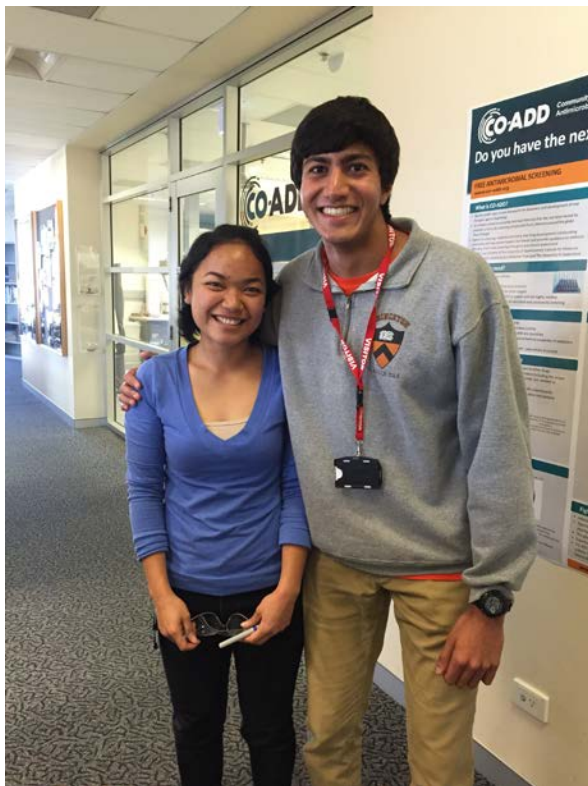
- Amide coupling required a lot of trial and error to determine the right conditions to create the intended product.



- The Boc group dissociated in the in the mas spectrum
- Purification



- Karl



It was absolutely incredible. Karl and Avril are amazing mentors and are always available for help but are also sure to make the project yours. The other members of the lab were incredibly supportive as well, and the general vibe of the place was very academic and laid-back at the same time (an interesting paradox). I would do it all over again in a flash. I learned so much about real-world drug synthesis and the hours that go into it. If there's any place to get your foot in the door for research or to build upon your organic chemistry experience, the IMB (and specifically the Cooper group) is the place. Being in Brisbane is incredible as well because it has everything you could possibly need. The city is very accessible, and if you're into nightlife, it has some of the best in all of Australia. My friends and I traveled whenever we could as well, and it is truly a beautiful country. I would 100% recommend this IIP if you liked organic chemistry and/or want to find out if you would like to continue studying chemistry at Princeton. If you have any questions at all about it, don't hesitate to shoot me an email. yashpatel@princeton.edu

Acknowledgements

