

Improving student engagement and research impact?

The Holy Grail or actually achievable?

Facilitated by Dr Marina Delpin – Research
Development Services

and

Cassandra Hood – Centre for Innovation in learning
and Teaching

Bridging the Gap Between Teaching and Research



Dr Justin M. Chalker

Flinders University | Institute for NanoScale Science and Technology | Adelaide



University of Pittsburgh



Prof Emeritus Ted Cohen
(1929-2017)
60 Years at Pitt



Two Syntheses of (-)-Kainic Acid via Highly Stereoselective Zinc-ene Cyclizations

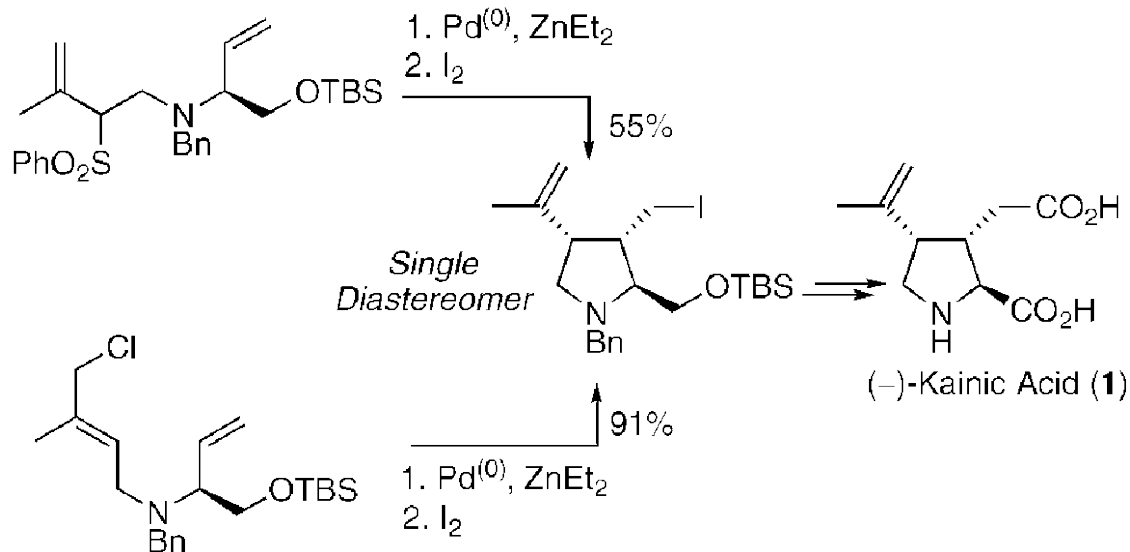


Justin M. Chalker,^{*,†} Ao Yang, Kai Deng,[‡] and Theodore Cohen^{*}

Department of Chemistry, University of Pittsburgh, Pittsburgh, Pennsylvania 15260



Digenea simplex



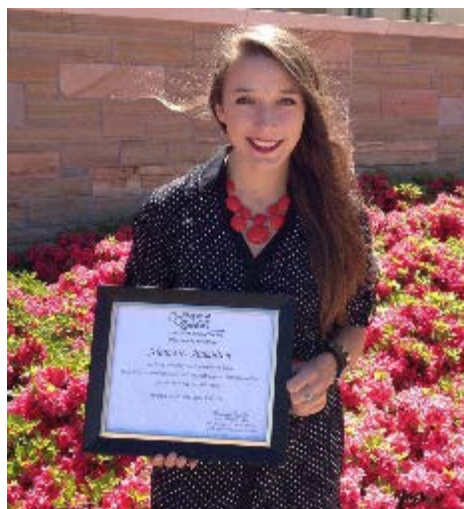
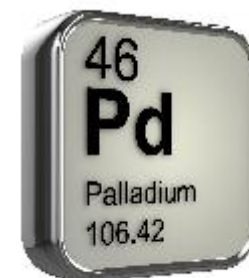
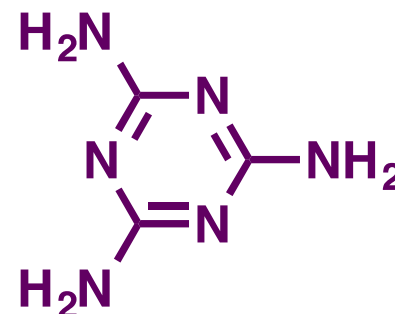
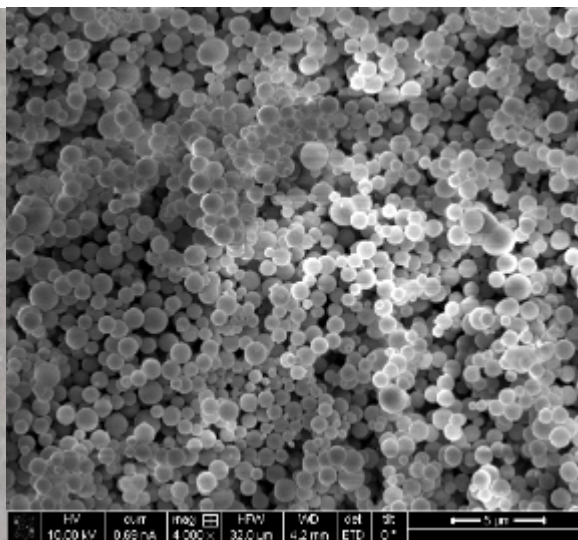


THE UNIVERSITY OF TULSA



New Catalysts for Pharmaceutical Synthesis

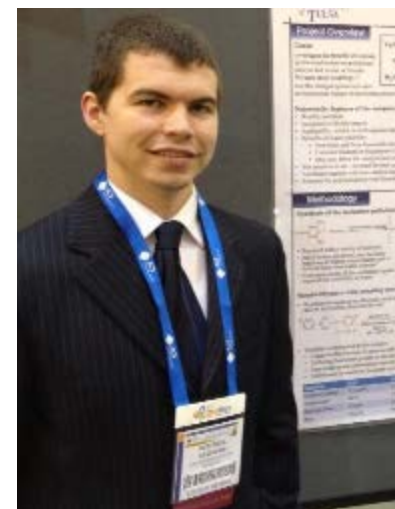
J. Org. Chem. **2014**, *79*, 2094-2104



Alaina Hamilton
Medicine
University of Oklahoma



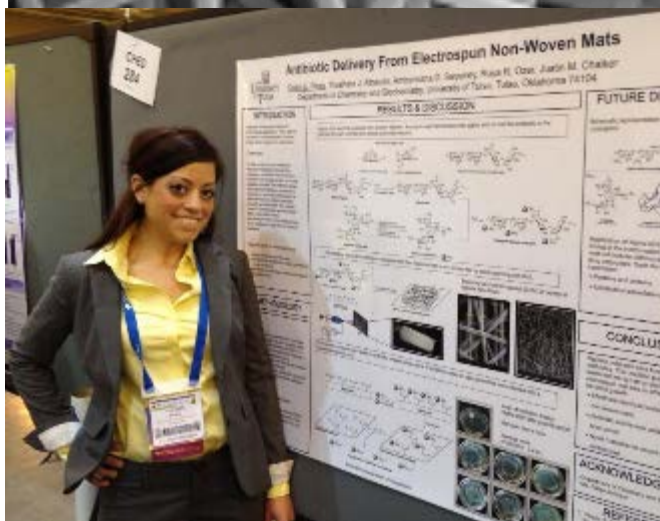
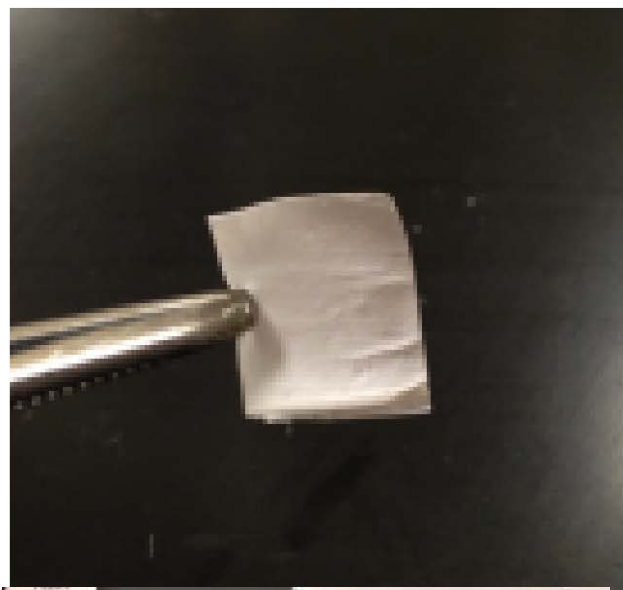
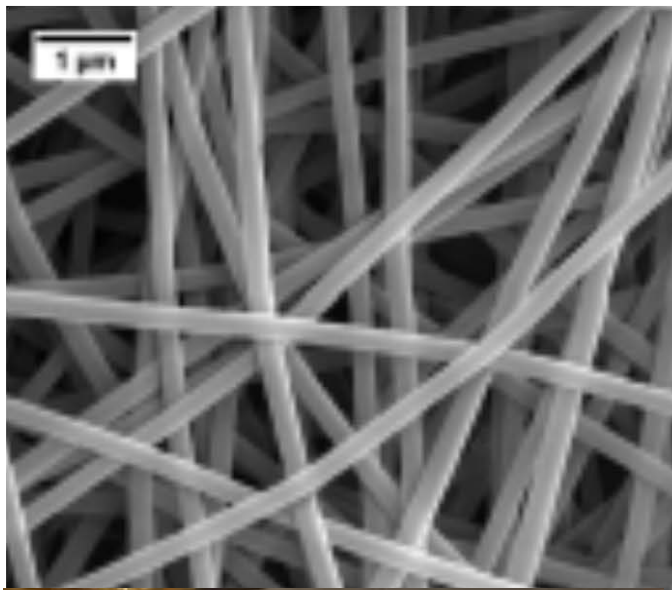
Audrey Buxton
Dentistry
US Marines



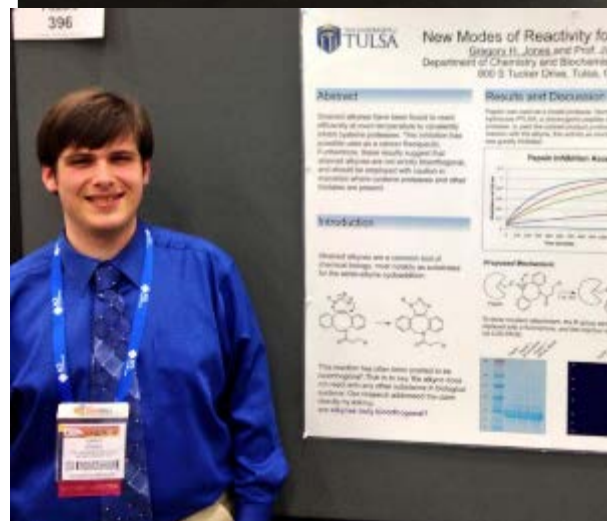
Mitchell Trafford
PhD, Chem Eng
Rice University

Medicated Nanofibres for Biodegradable Wound Dressing

Chem. Commun. 2014, 50, 156-158



Caitlin Pegg
PhD, Northwestern University

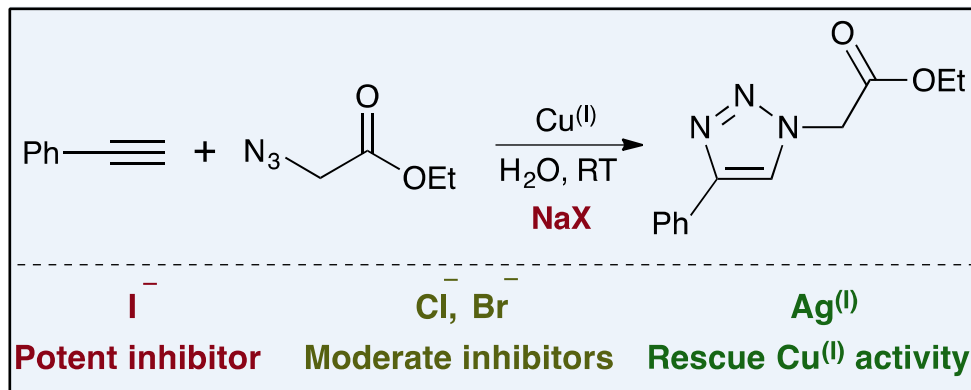


Greg Jones
PhD, CalTech

Inquiry-driven teaching labs



Rebekah Moorman
Nursing



Chem. Educator 2015, 20, 214–219



Moujtaba Kasmani
Medicine

Inquiry-Driven Investigation of the Copper-Catalyzed Azide-Alkyne Cycloaddition in the Undergraduate Organic Chemistry Laboratory

Rebekah M. Moorman[†], Moujtaba Y. Kasmani[†], Christopher J. Peeples[†], Justin M. Chalker^{**†}

Organic & Biomolecular Chemistry



COMMUNICATION

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 **Flinders**
UNIVERSITY

Environmental Applications of Sulfur Polymers

Canola oil
(including used cooking oil)



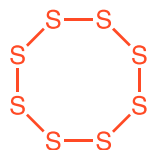
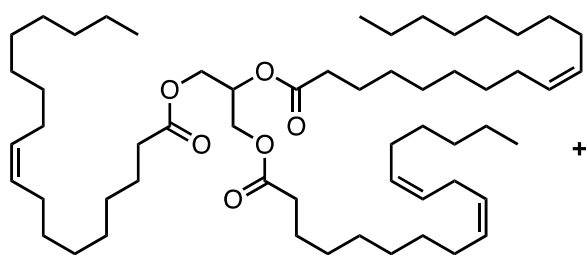
+

Elemental sulfur
(petroleum by-product)

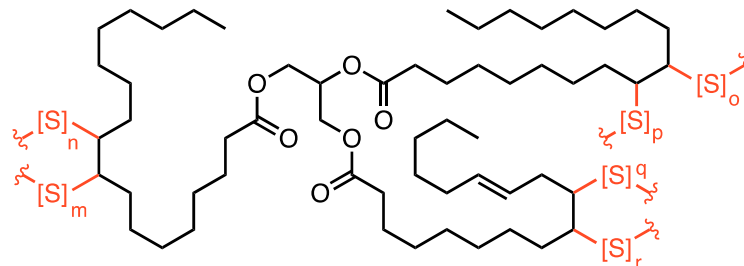


→

Canola oil polysulfide
(50-70 wt% sulfur; powdered or structured forms)



180 °C
20 min
(neat)



Oil spill clean-up



Crude oil recovery from seawater

Adv. Sustainable Syst. **2018**, 1800024

Mercury remediation



99% Hg removal from air, water, and soil

Angew. Chem. Int. Ed. **2016**, 1714

Chem. Eur. J. **2017**, 16219.

Controlled-release fertilisers



Org. Biomol. Chem. **2018**

In press

Environmental Applications of Sulfur Polymers



Michael Crockett



Austin Evans



Renata Kucera



Joshua McErlean



Sustainable Materials Hot Paper

International Edition : DOI: 10.1002/anie.201508708

German Edition : DOI: 10.1002/ange.201508708

Angewandte
International Edition
Chemie

Sulfur-Limonene Polysulfide: A Material Synthesized Entirely from Industrial By-Products and Its Use in Removing Toxic Metals from Water and Soil

Michael P. Crockett⁺, Austin M. Evans⁺, Max J. H. Worthington⁺, In⁺ S. Albuquerque, Ashley D. Slattery, Christopher T. Gibson, Jonathan A. Campbell, David A. Lewis, Gon⁺alo J. L. Bernardes, and Justin M. Chalker^{*}

& Mercury Removal | Hot Paper |



Laying Waste to Mercury: Inexpensive Sorbents Made from Sulfur and Recycled Cooking Oils



Max J. H. Worthington,^[a, b] Renata L. Kucera,^[a] In⁺ S. Albuquerque,^[d] Christopher T. Gibson,^[a, b] Alexander Sibley,^[a, b] Ashley D. Slattery,^[a, b] Jonathan A. Campbell,^[a, b] Salah E. K. Alboarji,^[a, b] Katherine A. Muller,^[d] Jason Young,^[a, e] Nick Adamson,^[a, b, h] Jason R. Gascooke,^[a, b] Deshetti Jampaiah,^[f] Ylias M. Sabri,^[f] Suresh K. Bhargava,^[f] Samuel J. Ippolito,^[f, g] David A. Lewis,^[a, b] Jamie S. Quinton,^[a, b] Amanda V. Ellis,^[a, b, h] Alexander Johns,^[d] Gon⁺alo J. L. Bernardes,^[c, i] and Justin M. Chalker^{*[a, b]}

Green Chemistry

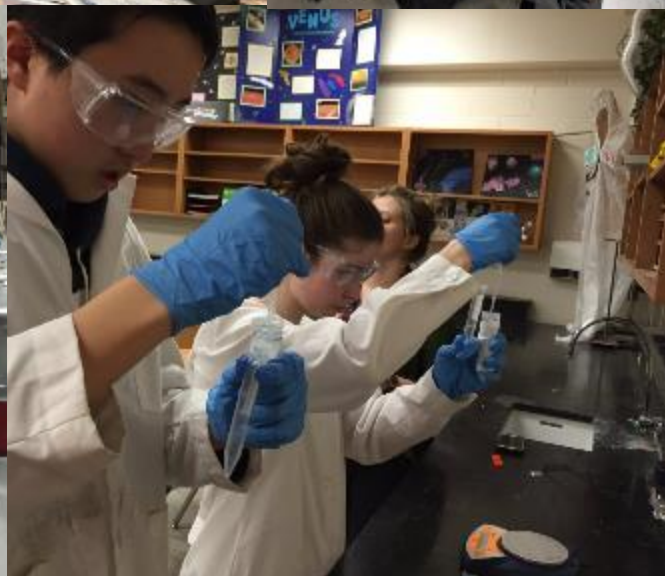
Organic & Biomolecular Chemistry

CHEMISTRY
A European Journal
Full Paper

Research and Outreach - Students on the Beamlines



Canadian Centre canadien
Light de rayonnement
Source synchrotron



Student Testimonials

“...these experiences allowed me to **be better equipped** in the transition to Honours and beyond.”

“...I was contributing to research which has **real-world impact**.”

“...**profound impact** on my **career** path.”

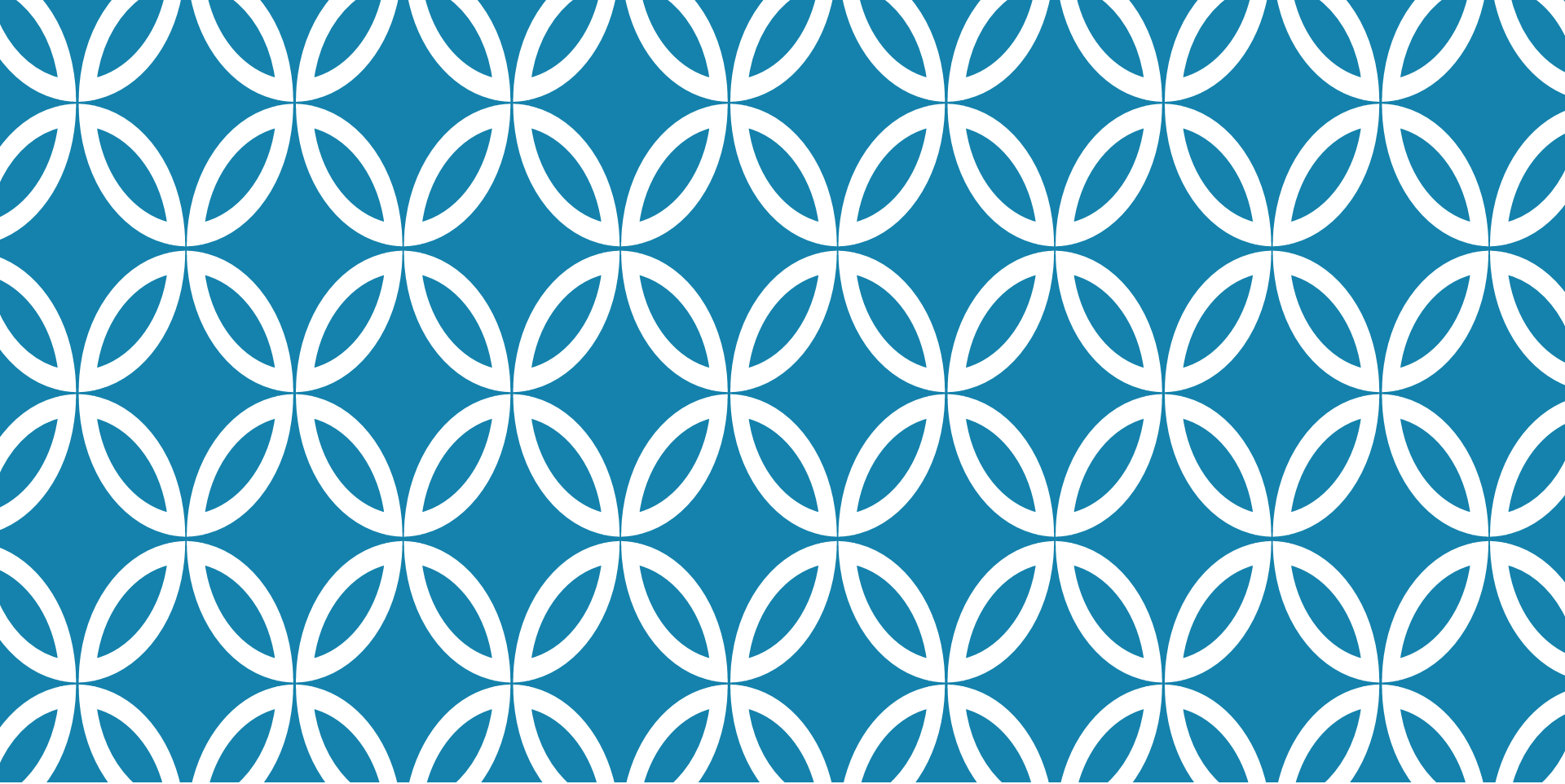
“I am **chuffed** my experiment was used in this publication...”

“I...**rediscovered my love for chemistry**...”

“...felt like **true research** and **not just the typical undergraduate laboratory** experience.”

“...this paper is something I can **show off** to friends, family and **future employers**...”

“...**highlight of my studies** so far.”



TEACHING AND LEARNING WEEK

Kim Devery

HOW HAVE I INTEGRATED RESEARCH INTO TEACHING?

Macro

Systematic Review - Deathbed phenomena reported by patients in palliative care: clinical opportunities and responses

PALL8439 Suffering Futility at the End of Life

Micro

Survey students to gain an understanding on issues (euthanasia) then providing a learning activity where students holding opposing viewpoints are paired to work together to examine and debate the issues.

HOW DO I BASE TEACHING AND LEARNING ON RESEARCH?

Peer review process – End of Life Essentials – education peer reviewed by over 50 clinicians.

What about post grad course work peer review?



STUDENTS ENGAGED? - WHAT WAS THE BIGGEST CHALLENGE?

SETS – “the discussions and debate were most useful - and enjoyable”

SES – above the national average

Challenge – present teaching in a way that engages – need to know who your learners are, what makes them tick, light bulb moments

SETS – same topic, same year, same semester

1. I did not feel I needed more support –

2. Improved communication between lecturer and students through constant e-mails and /or frequent telephone calls.



Student Engagement and Research Impact

ASSOCIATE PROFESSOR AMY ROBERTS

































