

Learning and Teaching Showcase #8

Teaching innovation that leads to
student engagement, retention and success.

November 7, 2018

Presentation 5

The Bush Medicine Project: A cross-course, cross-campus, cross-discipline undergraduate research project

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Indigenous Medicine

- At least 50,000 years of Indigenous Australian culture
- Holistic in nature but many herbal remedies and concoctions
- Much of which is lost information or poorly documented
- **Some Examples**
 - Black Wattle – Dysentery
 - Coastal Ballart – Insect repellent
 - Old Man's Beard – Pain relief

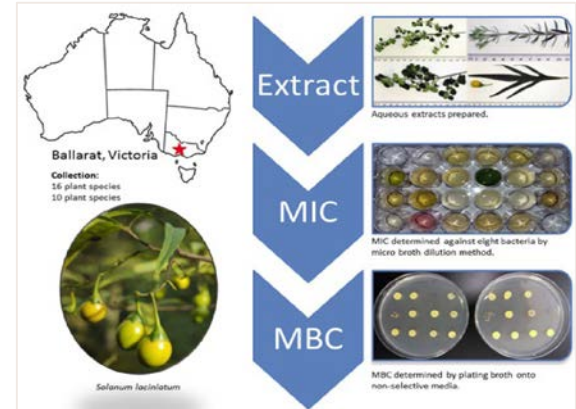


Cherry Ballart

F. Cahir, I. Clark, P. Clarke, *Aboriginal Bicultural Knowledge in South Eastern Australia*, 2018, CSIRO publishing
P. Clarke, *Journal of the Anthropological Society of South Australia*, 1987, 25 (5).
P. Clarke, *Journal of the Anthropological Society of South Australia*, 2008, 33 (5).

One Modern Approach to Medicine

- **Bioprospecting for new active compounds**
- Natural product extraction, followed by testing
- **3rd year project students**
- What about other undergraduate students?

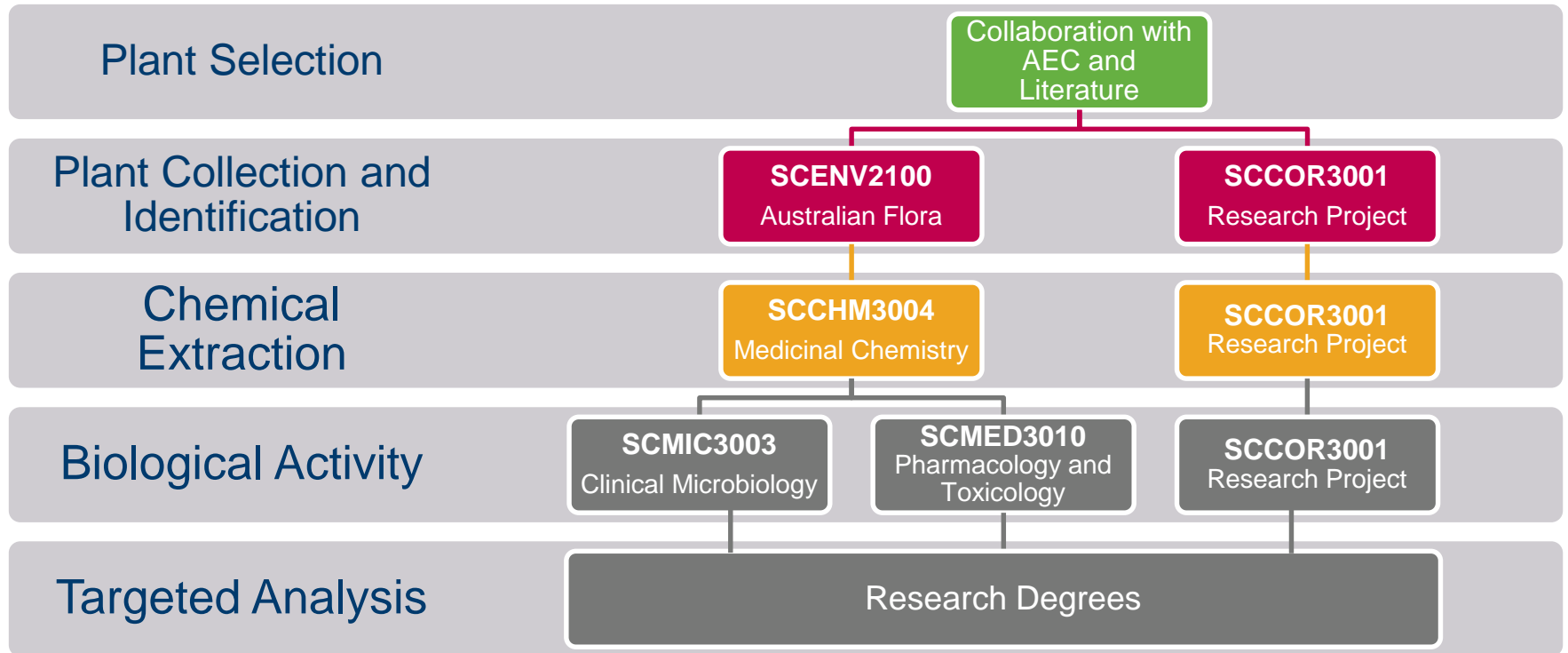


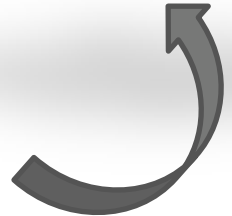
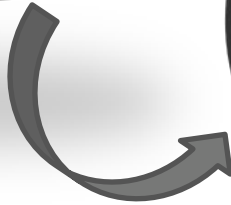
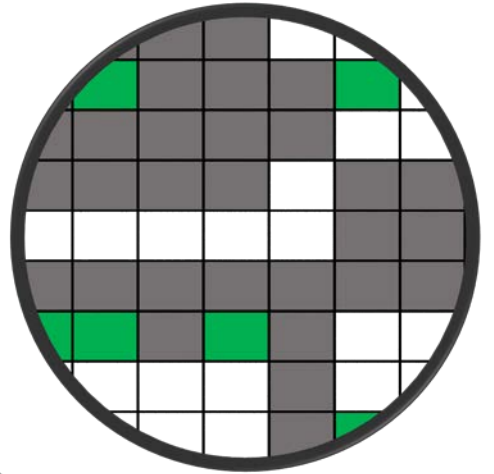
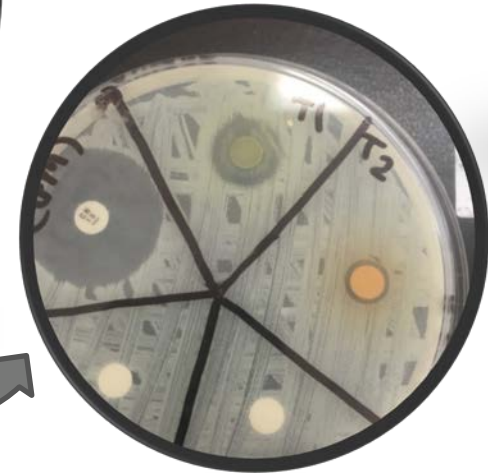
Involving The Undergraduate Students

- **Combine research and teaching**
- Align existing practical classes across courses

- **Enhance learning outcomes for students**
- Aboriginal history and culture
- Research skills
- Interdisciplinary nature of research
- Engagement

Project Outline



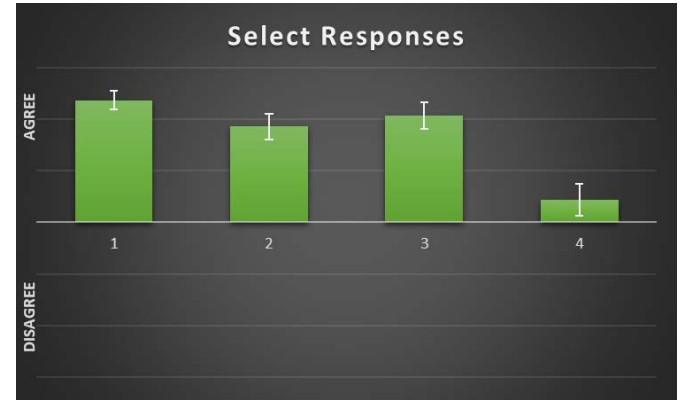


Teaching and Learning Outcomes I

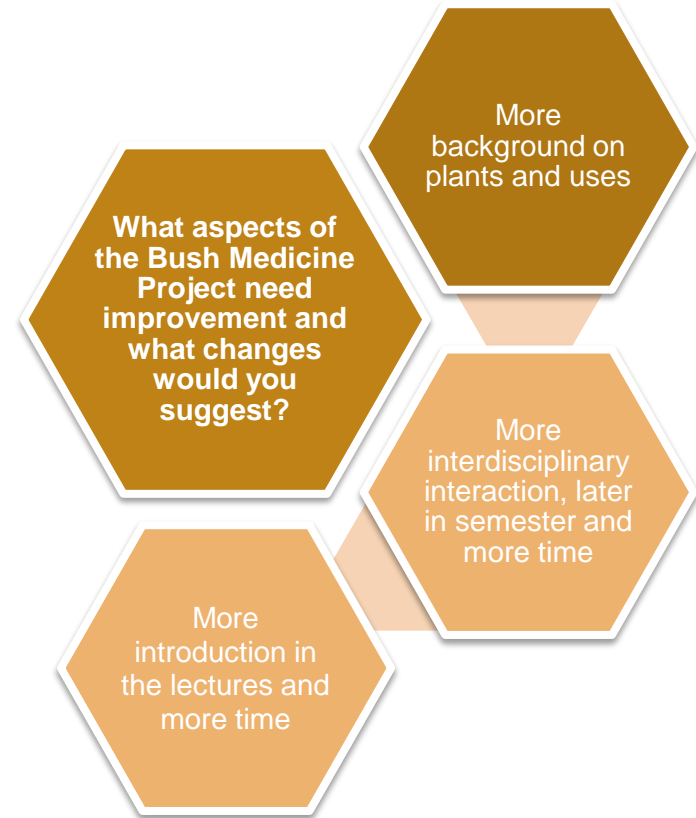
- Student surveys
 - n=55 (60% Response rate)
 - 17 Likert questions plus qualitative feedback.
 - Around engagement, research and indigenous culture
- Student focus groups
- Interview staff

Selected Likert Questions

1. I found this to be **interesting** practical class
2. I took **more care** in this practical session because I knew the results were meaningful
3. I am **excited** to know how my sample performs beyond my contribution
4. I have learnt something new about **indigenous Australian culture**

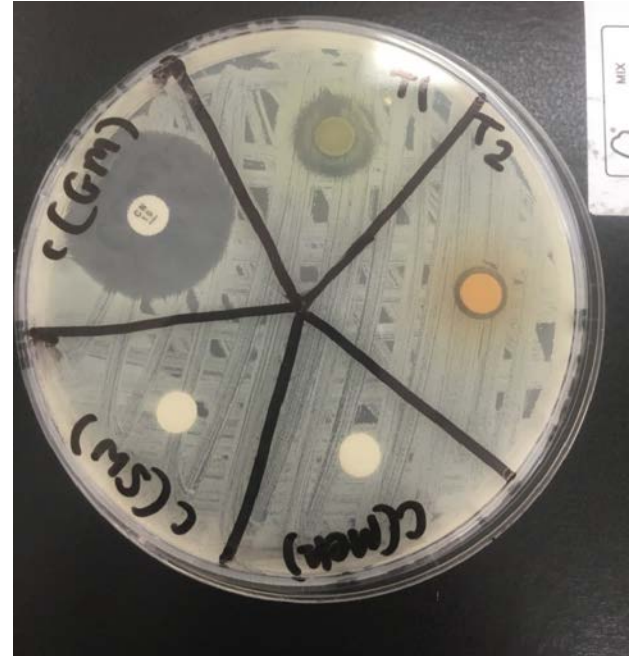


Qualitative Feedback



Summary and where to from here?

- Successful first year
 - Some “Hits” to investigate further
 - Educational outcomes promising
- Next year+
 - Toxicology
 - Replication and expansion
 - Addition of more cultural content



20180022 + 25 tested against *S. aureus*

Acknowledgements

SHaLS Staff

Nicolas Shultz

Simone Louwhoff

David Bean

Andrew Greenhill

Lara Wakeling

Mark Myers

Scott Nankervis

Jenny Mosse

Sarah Preston

Winston Doherty

Additional FedUni Staff

Jasmine Graham (AEC)

Nina Fotinatos (CLIPP)

Ian Clark (FBS)

Fred Cahir (Arts)

Peggy Hsu (Library)

Clare Duffy (Library)

Technical Staff

Geoff Rodgers

Benjamin Webb

Sarah Bean



<https://federation.edu.au/bush-medicine-project>

Australian Flora

- Australian Flora student collected leaf material
 - Mt Helen, Churchill, Berwick, Online
 - Identified Plant Family, Genus, Species
 - Photographically Documented
 - Gathered GPS Data
 - Affixed Barcodes
 - 36 unique samples (30 Species)



Students Gathering Hop Goodenia

Medicinal Chemistry

- Medicinal Chemistry students created extracts of leaf material
 - Methanol extraction and transfer into aqueous
 - Screened crude extracts against *M. Luteus*
 - HPLC Fingerprinting
 - Freeze dried aqueous extracts for quantification



Methanolic Extract filtered

Clinical Microbiology

- Clinical Microbiology
 - Redissolved known amounts of extracts
 - Screened extracts series of microorganisms
 - Disc diffusion assays



20180022 + 25 tested against *S. aureus*

Research Outcomes

- Initial “Screening” Results
- Clinical Microbiology Results
 - Green “Hit”
 - Grey “No Activity”
 - White “Not Tested”

	BMP20180006	BMP20180011	BMP20180012	BMP20180013	BMP20180021	BMP20180022	BMP20180025	BMP20180027
<i>A. baumannii</i>	Grey	Grey	Grey	Grey	White	White	White	White
<i>B. subtilis</i>	Grey	Green	Grey	Grey	Grey	Green	White	Grey
<i>Candida albicans</i>	Grey	Grey	Grey	Grey	White	White	White	Grey
<i>E. coli</i> ATCC 25922	Grey	Grey	Grey	Grey	White	Grey	Grey	White
<i>E. faecalis</i>	White	White	White	White	White	Grey	Grey	White
<i>K. pneumoniae</i>	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
<i>M. luteus</i>	Green	Green	Grey	Green	Grey	White	White	Grey
<i>P. aeruginosa</i>	White	White	White	White	Grey	White	White	Grey
<i>S. aureus</i> ATCC 25923	White	White	White	White	Grey	Green	Green	White
<i>Salmonella</i> Typhimurium	White	White	White	White	Grey	Grey	Grey	Grey



20180025

Red Ironbark
(anti-fungal, anti-septic)



20180011

Hop Goodenia
(Sedative)



20180022

Rock Correa



20180006
20180013

Wedge Leaf Hop Bush
(Colds, sore throats and fevers)



**Questions, comments,
suggestions**

