



Biology Educators' Association of New Zealand  
Te Rōpū Whakaako Koiora o Aotearoa

## Term 1 2017 Newsletter

web: [beanz.org.nz](http://beanz.org.nz)

email: [biologynz@gmail.com](mailto:biologynz@gmail.com)

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**Biology Educators' Association of New Zealand (BEANZ) is a Standing Committee of the New Zealand Association of Science Educators whose purpose is to support and promote Biology education throughout New Zealand.**

### BEANZ BioLive/ChemEd 2017 Scholarships

We are pleased to announce that BEANZ is offering eight scholarships, each worth \$495, for members to attend BioLive/ChemEd in Cambridge. Each scholarship covers early bird registration which includes onsite accommodation and meals.

There are many reasons why you might apply – perhaps you are an early career teacher or you are returning to teaching after a period of time outside of the industry. It may be that you have never attended a BioLive conference before or perhaps your school can only afford to send one staff member but the whole Biology department would like to attend. Whatever your reason, as long as you are a BEANZ member you are eligible to apply for a scholarship. Individuals and schools who have not been awarded a scholarship previously will have precedence.

To apply, please email [biologynz@gmail.com](mailto:biologynz@gmail.com) with the following details – Your name, organisation, email address and the reason for applying before Friday 31 March.

***“The more we  
know of the  
fixed laws of  
nature the more  
incredible do  
miracles  
become.”***

**Charles Darwin**





Monday July 10th - Wednesday July 12th 2017  
St. Peter's School, Cambridge, Waikato

### KEY DATES

Call for workshop submissions open now! Closes 31 March.  
Registration opens early March.

BioLive-ChemEd 2017 is the tandem biennial conference that combines chemistry and biology educators from across New Zealand.

Delegates, speakers and hosts will share conference life at the picturesque St. Peter's School, Cambridge for three days of inspiration, education and FUN!

### Highlights this year include:

- A stellar line-up of keynote speakers including: "*Rebel with a Cause*" **Sir Ray Avery** pharmaceutical scientist, inventor, social entrepreneur and best-selling author celebrating New Zealanders who dare to dream. Highly cited researcher in Pharmacology and Toxicology **Assoc Prof Michèle Prinsep** - named as one of the world's most influential scientific minds. And bestselling science author and consistently popular public speaker **Sam Kean**!
- Interactive workshops in a collegiate atmosphere in which ideas and professional relationships can flourish.
- Registration **including** accommodation and all meals onsite at less than \$500 for NZASE members.

**Want to know more?** Head to [www.biolivechemed.co.nz](http://www.biolivechemed.co.nz)  
**Sign up for event notices** [here](#).

We are very excited about this awesome event and look forward to seeing you in Cambridge in July!

Chris Duggan (On behalf of the conference committee)  
Questions? Email [admin@biolivechemed.co.nz](mailto:admin@biolivechemed.co.nz)



A big thank you to our principal sponsors for helping us create an inclusive conference available for New Zealand educators.

Interested in becoming a sponsor or exhibitor? We have room for you! Contact [admin@biolivechemed.co.nz](mailto:admin@biolivechemed.co.nz) now.

## Newsflash: Junior Vice President Needed

Congratulations to Matt Easterbrook who is now the Head of Science at Tereroa College in Rarotonga, Cook Islands. While in Rarotonga Matt hopes to strengthen BEANZ ties with our Pacific neighbours, something we are looking forward too.

This, however, has meant that Matt stepped down from his junior vice-president role for BEANZ which means we are looking for a dynamic, forward thinking biology educationalist to step into this position. The BEANZ executive are very supportive and there will be at least one year close support and mentoring for whoever steps up into this role before they would take over as president. This is an ideal opportunity for someone looking to give back to the profession while building their career. All current executive members attest to this role being one that opens doors, widens professional networks and acts as a stepping stone on leadership pathways. If interested please get in contact with Sharyn Varcoe via the BEANZ email or [va@riccarton.school.nz](mailto:va@riccarton.school.nz) for further details.



## NZIBO Teacher Scholarships

The NZ International Biology Olympiad program (NZIBO) fosters interest, participation, and excellence in biology through participation of secondary school students in a programme that provides University level education in Biology to those students selected to participate in the online tutorial programme.

NZIBO ensures that the students who participate have the necessary knowledge to compete successfully at the International Biology Olympiad (IBO) if selected to represent New Zealand at this prestigious international competition. 2017 – in the UK.

To enhance understanding of the program and promote this to NZ teachers and their students - NZIBO will offer two teacher scholarships to the training and the selection camp. These scholarships will include: transport to and from the camp, accommodation and meals at the camp and full participation in all of the learning, trips and labs (just like the students). You will also get to meet academics and teachers from around NZ. This is a wonderful professional development opportunity and a chance to work with passionate biologists; students, scientists, and university staff.

The Waikato University portion of the camp starts on Tuesday 18<sup>th</sup> April ending with the practical exam on Saturday 22<sup>nd</sup> April. This part of the camp is lab based and teaches practical biology skills. The Auckland leg runs from the 23<sup>rd</sup> and ends with the theory exam on Tuesday 26<sup>th</sup> April. This leg features workshops on biostatistics and development, a current biology research symposium, evolution labs, and behaviour and ecology field work.

To apply you need to write a one page letter – A4, size 11 font.

Please include:

Your name, school, email address

Write one paragraph about yourself with a photo, suitable for inclusion in a newsletter about the camp.

A description of your reasons for wanting to come to camp

The leg of the camp you would like to be involved with.

Applications close by 10<sup>th</sup> March.

Please email the secretary: Dr Heather Meikle [h.meikle@pnghs.school.nz](mailto:h.meikle@pnghs.school.nz)





## New Zealand National Biomechanics Day



National Biomechanics Day is a celebration of biomechanics that will be held simultaneously in university labs across New Zealand on **3 April 2017**. The movement began in the US as a way to expose **secondary school students** to hands-on experiential learning activities centred around biomechanics research. The event has become so popular that National Biomechanics Day is being celebrated by thousands of students and teachers across international borders, including UK, Canada, Brazil, and **NEW ZEALAND!**

### Why participate in National Biomechanics Day?

Your students will have access to state of the art equipment for collecting motion, muscle function and strength, and force. They will actively participate in lab demonstrations and interact with lecturers, researchers, postgraduate and undergraduate students who will show how biomechanics is applied to:

- ☐ Sport Performance
- ☐ Medicine and Medical Devices
- ☐ Physiotherapy and Health
- ☐ Animal Sciences
- ☐ Creative Arts and Media Production

### What Learning Outcomes will my students achieve?

The New Zealand National Biomechanics Day has been adapted to align with key points in all three action areas of *A Nation of Curious Minds – He Whenua Hihiri/Te Mahara*, and also addresses achievement outcomes (TKI levels 5-8) that are outlined in the New Zealand curriculum.

- ☐ Understand that scientists' investigations are informed by current scientific theories and aim to collect evidence that will be interpreted through processes of logical argument.
  - ☐ Investigate how physics knowledge is used in a technological or biological application.
  - ☐ Investigate physical phenomena (in the areas of mechanics, electricity, electromagnetism, light and waves, and atomic and nuclear physics) and produce qualitative and quantitative explanations for a variety of unfamiliar situations.
  - ☐ Use physics ideas to explain a technological, biological, or astronomical application of physics and discuss related issues.
- Specific Physical Education Outcomes include:
- ☐ Apply relevant scientific, technological, and environmental knowledge and use appropriate resources to improve performance in a specialised physical activity.
  - ☐ Critically analyse and experience the application of scientific and technological knowledge and resources to physical activity in a range of environments.
  - ☐ Devise, apply, and evaluate strategies to improve physical activity performance for themselves and others.

### How do I get involved?

Session times and locations will vary by university, so please check out the following links for more information:

Visit our Facebook page: <https://www.facebook.com/NZ-National-Biomechanics-Day-582100951994801/>

Send us an email: [nz.biomech.group@gmail.com](mailto:nz.biomech.group@gmail.com).

Register your class at <https://goo.gl/forms/Ok8dMSfk9TcmWjdH3>

## A PIECE FROM THE PROFESSOR

# Hamish Spencer

TERTIARY REP



### Predator-Free 2050 and Beyond

Many people will be aware of the government's announcement last year of an ambitious goal to rid New Zealand of introduced mammalian predators, such as possums, rats and stoats, by 2050 (see <http://www.doc.govt.nz/predator-free-2050>). This aspiration is grounded in the ground-breaking work carried out in New Zealand over the past 40 years or so that eliminated such pests from increasingly large islands. When this work began, such achievements were almost unthinkable. Yet we have now freed over 100 islands of mammalian pests, culminating in the largest of these clearances, that of the subantarctic, 11,300-ha Campbell Island (see <http://www.doc.govt.nz/our-work/campbell-island-rat-eradication/>). The subsequent transformation of the island's whole ecosystem was stunning. In a few short years, the renewed plant growth made walking around the island a completely different experience and birds were seen that had been absent for over 100 years.

The goal of eliminating mammalian pests from the New Zealand mainland, however, is a much bigger task. It will surely need some quantum improvements in our methods and require approaches that have not been previously considered, such as various molecular and genetic tools. Research into a number of novel methods is being carried out around the country, often under the umbrella of the Biological Heritage National Science Challenge (see <http://www.biologicalheritage.nz/programmes/risks/hi-tec-solutions>). A number of genetic methods have intriguing names: Trojan females and gene drive are two promising possibilities.

The Trojan-female technique relies on the strict maternal inheritance of mammalian mitochondria: mitochondrial DNA (mtDNA) in males is at an evolutionary dead end. Thus any mutation in mtDNA that affects males but not females (e.g. one that impairs sperm motility) will not be selected against. The idea is to flood a population with "Trojan females" that carry such mitochondria, thereby reducing the number of functional males, which in turn should decrease the population size. See more at <http://www.landcareresearch.co.nz/science/plants-animals-fungi/animals/vertebrate-pests/trojan-female>.

The latest version of gene-drive technologies uses the CRISPR-Cas9 construct in what is called a "mutagenic chain reaction" to convert heterozygotes to homozygotes, which then pass on the construct to all their offspring (instead of the half that Mendelian inheritance would predict). This bias rapidly increases the frequency of the construct and its linked genes, which might include a gene determining male sex or one increasing vulnerability to some toxin. These outcomes can be used to control a pest population, which may run out of females or be targeted with the toxin. Gene drives are potentially very powerful and have consequently gained much attention in the popular press (see, e.g., <http://thebulletin.org/gene-drives-good-bad-and-hype10027>).

Whatever happens with Predator-Free 2050, it will be just the first battle in a much longer war. Dealing with insect pests, such as invasive ants, which are immensely destructive of our relatively unknown native invertebrate fauna, will be much harder. Removing mammals is relatively easy because, apart from rare bats, New Zealand has no native land mammals. But how do you eliminate an introduced pest ant while at the same time conserving a precious native ant? And then there are the invasive plants ...

**Hamish Spencer**

Department of Zoology / Te Tari o Mātai Kararehe  
**University of Otago / Te Whare Wānanga o Ōtago**

# QUALITY ASSURED ASSESSMENT MATERIAL

## Biology 2.1 “Variation in a Forest Canopy” Resource Pack

As requested by members, BEANZ has put together a resource pack for members which includes AS91153 Bio2.1 “Carry out a practical investigation in a biological context, with supervision” task, resource material and schedule which have successfully been through the QAAM process. For those new to this, QAAM stands for Quality Assured Assessment Materials which means that NZQA have already checked the materials and guaranteed they are at standard. This means you can use them with confidence.

The task has successfully been trialled in a New Zealand school and uses resources commonly found in secondary schools throughout the country. As well as the QAAM task, materials and schedule the resource pack also includes teacher guidelines, background readings and student graphic organiser which can be used as part of the teaching and learning process prior to assessment.

The value of this resource depends on the continued security of both the task and schedule so it is only accessible through BEANZ. While eventually it will be accessible via our new website, currently if you wish to have a copy of the resource pack you need to email your request to [biologynz@gmail.com](mailto:biologynz@gmail.com) and include your name, school and email address.

### Maurice Wilkins Centre Free Teacher PD Days

Maurice Wilkins Centre are holding Free Teacher PD Days in April covering a range of topics, including, genetic engineering technologies (with a focus on CRISPR), selective breeding examples for contemporary issues and genetic manipulation, antibiotic resistance (good PD and great for year 11 – contemporary issues) regulation of energy metabolism and more.

**Monday 3 April Westport**  
**Tuesday 4 April Christchurch**  
**Thursday 6 April Wellington**  
**Friday 7 April New Plymouth**  
**Monday 10 April Dunedin**  
**Wednesday 12 April Auckland**

Additional sessions will be held later in the year in Hawkes bay, Bay of Plenty and Northland.

More information will be sent out soon with specific details of the talks, the speakers, venues and how to register. There will be no registration charge.

Peter Shepherd [peter.shepherd@auckland.ac.nz](mailto:peter.shepherd@auckland.ac.nz)  
Rachel Heeney [rheeney@eggs.school.nz](mailto:rheeney@eggs.school.nz)

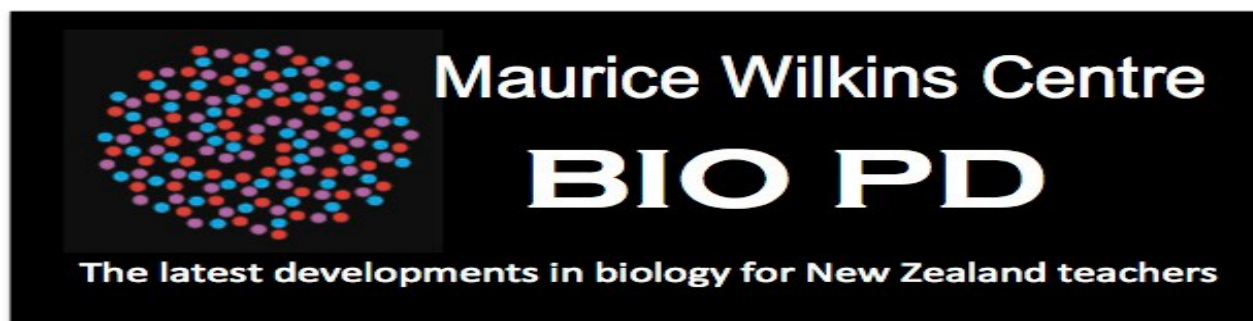
**Co-ordinators of MWC Bio Teachers PD Programme**

### Biology Educators’ Association of New Zealand

#### Te Rōpū Whakaako Koiora o Aotearoa

**A Standing Committee of the New Zealand Association  
of Science Educators**

Executive Position	Name
<b>President (NZASE Rep)</b>	Sharyn Varcoe
<b>Senior Vice President</b>	Kate Rice
<b>Junior Vice President</b>	
<b>Treasurer</b>	Peter Sutton
<b>Secretary</b>	Helen Mora
<b>Publications Co-ordinator</b>	Holly Brooshooft
<b>Website</b>	Ben Himme
<b>Curriculum Support Team</b>	Terry Burrell Penny Daddy Jo Hurst
<b>Primary Biology Education</b>	Hazel McIntosh
<b>Tertiary Biology Education</b>	Hamish Spencer
<b>Assessment Project</b>	Bill van den Ende
<b>Science Facilitators</b>	Mikhal Stone
<b>Regional Rep. Coordinator</b>	Sharyn Varcoe



## Details of 2017 Professional Development Dates Announced To Date

The MWC is running its first biology teacher PD days in early April. Dates and venues are in the table below and below that on page 2 are details of what subjects speakers will focus on.

**Registration is free.** The link to the registration site can be found on the MWC Teacher outreach page

Date	City	Venue	Speakers
3 April	Westport	Buller High	Prof Andrew Shelling Prof Peter Shepherd
4 April	Christchurch	Rydges Hotel	Prof Andrew Shelling Prof Peter Shepherd Prof Greg Cook Dr Theresa Holm
6 April	Wellington	Victoria University	Prof Andrew Shelling Prof Peter Shepherd Dr Maren Wellenruther Dr Goetz Laible, Agresearch
7 April	New Plymouth	Waterfront Hotel	Prof Andrew Shelling Prof Peter Shepherd Dr Goetz Laible, Agresearch
10 April	Dunedin	Otago Museum	Dr Giles Yeo Prof Peter Shepherd Dr Kiel Hards Prof Antony Braithwaite
11 April	Wellington (special public event open to teachers)	Royal Society of NZ	This is a MWC organised public symposium on the science of obesity and Type-2 diabetes. It will run from 10 am -1 pm and we can reserve space for teachers if there is interest. It will feature talks by Dr Giles Yeo (of Cambridge University and BBC fame) and researchers from the Maurice Wilkins Centre
12 April	Auckland	Epsom Girls Grammar	Dr Giles Yeo Prof Peter Shepherd Prof Dave Grattan Dr Maren Wellenruther Prof Rod Dunbar Dr Theresa Holm
More dates and venues to be announced later, most probably in Northland, Bay of Plenty and Hawkes Bay			

## Details of subjects of talks

### **Prof Andrew Shelling (University of Auckland)**

Human assisted reproduction and embryo selection

(Relevant to standard 91607 and 91602)

How to use genomics to understand disease (some locations)

### **Prof Peter Shepherd (University of Auckland)**

New advances in genetic engineering (including CrispR Cas9)

(Relevant to standard 91607)

Updates on new cancer drugs (some locations)

### **Prof Greg Cook (University of Otago)**

Microbes and drug resistance

(Relevant to standard 90950)

### **Dr Giles Yeo (University of Cambridge, UK)**

Our diet and its relation to obesity and type-2 diabetes

(Relevant to standard 91604 and 91602)

### **Dr Maren Wellenruther (Plant and Food Research)**

Selective breeding in fish

(Relevant to standard 91607)

### **Prof Dave Grattan (University of Otago)**

How pregnancy changes metabolism and behaviour

(Relevant to standard 91604)

### **Prof Antony Braithwaite (University of Otago)**

Advances in cancer research and therapy

### **Dr Kiel Hards (University of Otago)**

Antibiotic resistance

(Relevant to standard 90950)

### **Dr Theresa Holm (University of Auckland)**

New developments in human stem cells

(Relevant to standard 91602)

### **Prof Rod Dunbar (University of Auckland)**

How understanding the links between the immune system and cancer has lead to

the development of new cancer wonder drugs

### **Dr Goetz Laible (Agriculture Research)**

Transgenesis and cloning in large animals

(Relevant to standard 91607 and 91602)

## Holly Brooshooft

Publications Co-ordinator

Otumoetai College



## Benjamin Himme

Website Designer

Napier Girls High



The thing I love about teaching is the looks on the faces of students when they discover new and exciting things, or when students overcome a challenge and have their 'ah-ha moments'.

I volunteered at BEANZ after the SciCon as a way to challenge myself and give back to the Biology community.

In my spare time I play golf, read books and enjoy spending time with my family and friends.

I'm a full-time Biology teacher at Napier Girls High.

In my spare time I'm developing a website ([www.pathwayz.org](http://www.pathwayz.org)). I'm also helping to develop the new BEANZ website. There's lots going on in the background and we should be releasing a few significant update soon.

## Biology Educators' Association of New Zealand

### Te Rōpū Whakaako Koiora o Aotearoa

A Standing Committee of the New Zealand Association of Science Educators 2017

## Regional Representatives

Region	Name	Email Contact
Northland	Julie Harrison	<a href="mailto:JHarrison@kerikeri.ac.nz">JHarrison@kerikeri.ac.nz</a>
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	Penny Daddy	<a href="mailto:pennyD@stcuthberts.school.nz">pennyD@stcuthberts.school.nz</a>
Waikato		
Bay of Plenty	Jean Grattan	<a href="mailto:jgrattan@otc.school.nz">jgrattan@otc.school.nz</a>
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Gisborne		
Hawkes Bay		
Taranaki		
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Otago	Pru Casey	<a href="mailto:pru.casey@gmail.com">pru.casey@gmail.com</a>
Southland	Lee Pirini	<a href="mailto:lee.pirini@southlandgirls.school.nz">lee.pirini@southlandgirls.school.nz</a>