

RESPIRATORY TECHNOLOGY TEAM ANNUAL REPORT 2014

Respitech@Woolcock

The Woolcock Institute is a multidisciplinary team dedicated to understanding and treating respiratory and sleep disorders. With over 200 research and clinical professionals we are a world leader in the area of research, clinical diagnosis and treatment. The Respiratory Technology group is a department within the Institute that bridges basic research with clinical operations



2014 | REPORT | RESPIRATORY TECHNOLOGY WOOLCOCK INSTITUTE OF MEDICAL RESEARCH

Annual Report of Operations and Activities

OVERVIEW

2014 has been a productive year for the Respiratory Technology (RespiTech) group at the Woolcock Institute of Medical Research. This report marks the 2nd anniversary of the groups official establishment in January 2013.



RespiTech Formulation Lab

Over the past 12 months, the RespiTech group have been building capacity, establishing new collaborations, funding and areas of research within the pulmonary drug delivery field. This report highlights major 2014 milestones.

GROUP MEMBERS

The Respiratory Technology team had 31 members in 2014 with ~20 current members as of December.

- Paul Young
- Daniela Traini
- Mehra Haghi
- Hui Xin Ong
- Eric Zhu
- Wing Hin Lee
- Judy Loo
- Maree Svolos
- Jesslynn Ooi
- Yang Chen
- Sharon Davis
- Valentina Trotta
- Alaa Tulbah
- Michele Pozzoli
- Emellie Brit Linnea Land
- Mariateresa Stigliani
- Giulia Ballerin
- Mariam Mamlouk
- Larissa Gomes Dos Reis
- Sumit Arora
- Khanh Huynh
- Tim Corish
- Angelo Granieri
- Anphy Nguyen
- Nadine Vermeiren
- Joao Da Conceicao
- John Chan
- Mary Goud
- Jasper Lamers
- Wilco Van den Oetelaar
- Matteo Padroni

RespiTech Members through 2014

WEB PORTALS

The Respiratory Technology team has a number of web portals for information., news, events, media and social activities. Links to these resources are:

www.RespiTech.org

www.facebook.com/RespiTech

www.twitter.com/RespiTech

FACILITIES

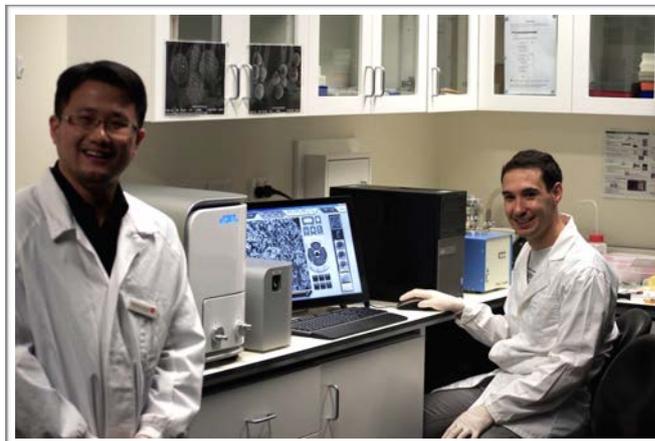
The RespiTech team have invested heavily in state-of-the-art facilities over the past 2 years. During 2014, further expansion and acquisition of infrastructure has continued. Of note, the team has invested in microscopy, analytical and advanced testing instrumentation including HPLC/MS, SEM, rheometry and dissolution testing equipment. A list of some of the core facilities are outlined below

- Multiple HPLCs
- HPLC-MS
- Modulated DSC
- TGA/DSC
- DVS & Karl Fisher
- Rheometer
- In-line laser diffraction (Spraytec)
- Laser diffraction (wet and dry) Malvern Mastersizer 3000
- Bench-top SEM
- Confocal & Raman Microscopy
- Atomic Force Microscopy
- Apparatus 4 automated dissolution testing
- Organic spray dryer
- Air-jet micronisation
- pMDI filling rig
- Mixers and blending facilities
- Multiple NGI, AGI, MSLI workstations
- Flow-volume simulation
- Integrated cell deposition apparatus
- Cell culture facilities
- 3D printing and CNC

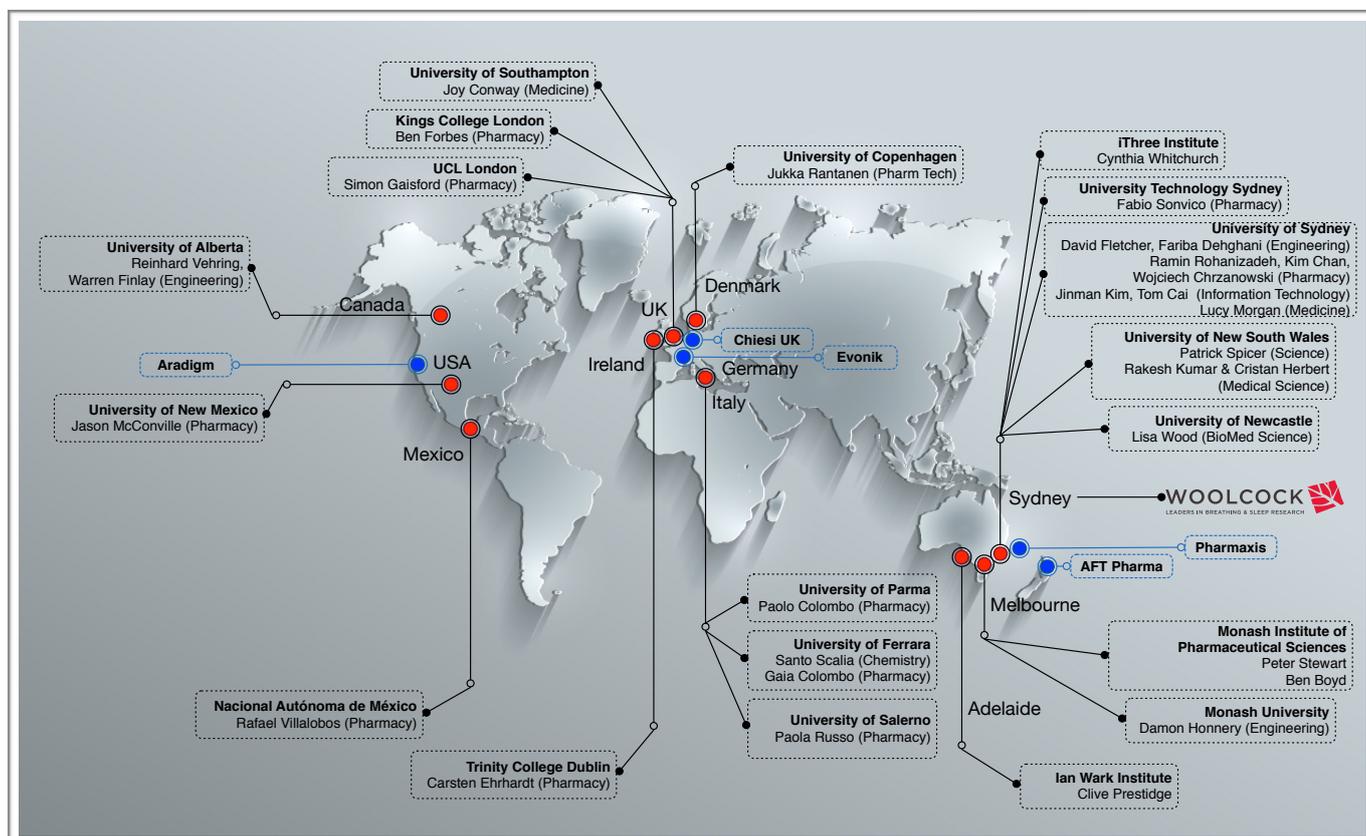
Overview of some of the RespiTech key facilities

COLLABORATORS & INITIATIVES

The RespiTech team have continued to collaborate with research teams across the world in both academia and industry. Industry partners include Chiesi UK, Evonik, Aradigm, AFT and Pharmaxis. Many of these collaborations have resulted in joint grant funding. In addition to our academic and industrial partners, the RespiTech team continues to lead a number of initiatives including OzNose.org and ECR2STAR.org focussing on nasal drug delivery and early career researcher development, respectively.



The OzNose project has already resulted in a successful competitive grant to undertake clinical studies for chronic rhino-sinusitis, while ECR2STAR has engaged thousands of ECRs with helpful and insightful articles. The group will continue to develop these initiatives during 2014. Of note, during 2014, we established the RespiBugs Group. RespiBugs is a collaborative team established between A/Prof Cynthia Whitchurch's bacteria and biofilm group at the iThree institute and the RespiTech group. This collaboration is to establish new infectious models of the respiratory tract and develop innovative therapies for the treatment of bacteria and biofilm related lung and nasal diseases. The group have shared postdoctoral and postgraduate students working on a number of projects.



RespiTech collaborators through 2014

VISITORS & EXCHANGE

A number of world leading researchers have visited and spent time on sabbatical with the group in 2015.

Visitors included, Carsten Ehrhardt (Trinity College, Dublin); Warren Finlay (University of Alberta); Jose Loius Pedraz and Angela Losada (Basque Country University) and David Lewis and Gemma Keegan (Chiesi UK).

Members of the RespiTech team have also spent time overseas conducting research. YY (Dr Hui Xin Ong) has spent 2014 in Prof Joy Conway's laboratory in the UK undertaking an ERS fellowship in the area of scintigraphy. Dr Mehra Haghi commenced her Humboldt Fellowship in Prof Lehr's group in Germany, focussed on developing cell based models for respiratory drug delivery.



ISAM-Woolcock 2015 Conference and Workshop delegation

CONFERENCES & TRAVEL

The RespiTech team both attended and hosted a number of events throughout 2014. Of note, was the 2014 International Society for Aerosols in Medicine (ISAM) and Woolcock joint conference and workshop. This was a great opportunity for the RespiTech team to host a number of delegates from across the globe. Talks and workshop material from this conference, as well as a photo gallery, can be found at www.woolcock.org.au/isam2014. The group were also involved in Drug Delivery Australia with workshop in Adelaide and annual conference in Melbourne.

Overseas, members of the group travelled to Puerto Rico to attend Respiratory Drug Delivery (RDD), India to attend RDD Asia, Edinburgh to attend DDL25, Wales for i3, Chicago for the Controlled Release Society annual meeting, China for an International Pharma conference and London for Management Forum. A number of members have given invited presentations at these events and more details can be found in our monthly [news letter archive](#) [SPIRITUS](#) and [blog](#). Members of the group have travelled to numerous universities and companies across Europe and the US to establish collaborations and present.

OUR BRAND

The RespiTech team have developed their brand image during 2014 and we now have a new logo. For 2015 a number of brand related initiatives are already underway.



AWARDS & APPOINTMENTS

Members of the group have received a number of awards and appointments during 2014. Highlights of some of these are outlined below:

- Mehra Haghi was awarded a Humboldt fellowship.
- Wing-Hin Lee was given the inaugural Woolcock Early Career award which he used to develop an idea that has resulted him obtaining a Cancer Institute of New South Wales ECF for >\$590k.
- Hui Xin Ong (YY) was awarded a ECR award at the Chiesi Innovation Conference in the UK.
- Judy Loo, Wing and YY were awarded a Marie Bashir Institute For Infectious Diseases And Biosecurity (MBI) Seed project fund.
- Mehra was awarded a Asthma Australia travel award.
- Mariam Mamlouk was awarded an Australian Postgraduate Award (APA) scholarship.
- Michele Pozzi was awarded a vice chancellors travel grant from UTS.
- YY was awarded an Aerosol Society Travel award.
- Tim Corish was awarded The Sydney Mechanical Engineering Association (USMEA) First Prize in Professional Communication in Mechanical Engineering .
- Mehra was appointed as Lecturer in Pharmacy at the Graduate School of Health, UTS.
- John Chan was appointed as Formulation Scientist & Project Manager at JHL Biotech in Taiwan.
- Jesslynn Ooi was appointed as a materials scientist at GSK in the UK.
- Paul was appointed as Professor of Respiratory Technology (School of Medicine USyd).
- Paul and Daniela were appointed as honorary Adjunct Professors at UTS.



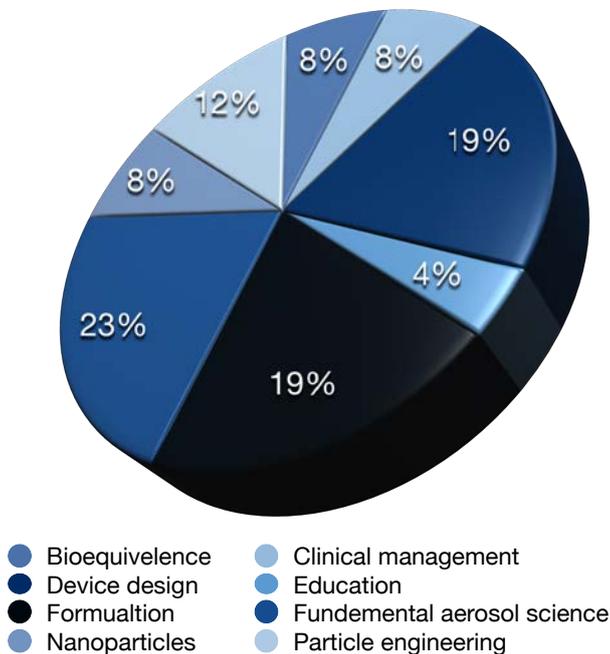
RespiTech Photo - mid 2014

NEWS AND MEDIA

Members of the group have been involved in a number of media events during the year. Paul was interviewed on local and national (ABC) radio, discussing the problems associated with sinus infection. Paul was also interviewed by John Scott on 4BC radio's Health and Wellbeing Show discussing the issues with common lung diseases including asthma, COPD and tuberculosis. This interview coincided with the launch of a [new video](#) and partnership focussing on TB with Pharmaxis Ltd, of which Daniela was the lead. The group were also instrumental in developing a [Woolcock promotional video](#).

RESEARCH OUTPUT

The Team published 31 peer reviewed publications in 2014 listed on the respitech.org webpage ([direct link here](#)). The publications are across a range of fields within the area of respiratory technology as outlined below. The 31 publications had an average impact factor of >3.2. In addition the group published numerous full peer reviewed conference papers.



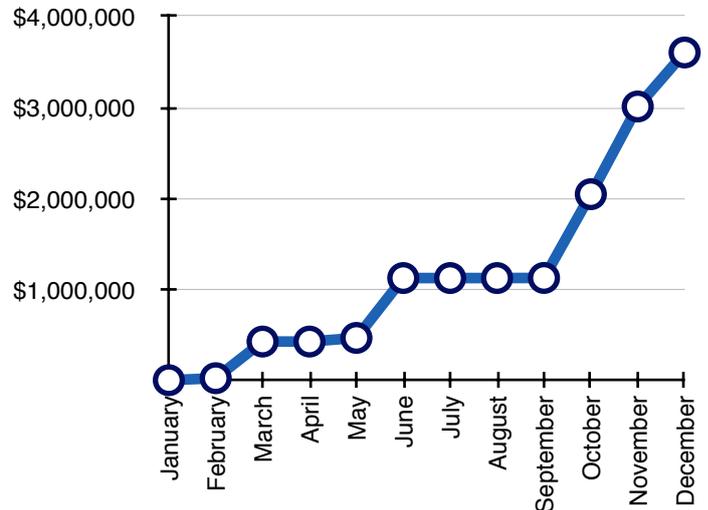
Distribution of research output by category

GRANT FUNDING

The group were successful in obtaining a number of additional grants in 2014. Past, current and new competitive grants are outlined on the respitech.org web page ([direct link here](#)). During 2014 the group secured a number of new grants totalling ~\$3,600,000

THE YEAR AHEAD

2015 will be another exciting year in the pulmonary field. the RespiTech team are gearing up for further expansion and a number of new exciting projects. Specifically the team will begin to focus on translation into the clinic and establish a number of projects across disciplines throughout the Institute.



Cumulative grant income for 2015 (month awarded)

Key awarded grants include:

- ARC Linkage project developing inhaled vaccine delivery 2014-2017 (\$656,638 including Partner contribution)
- NHMRC Development grant to investigate innovative therapies for chronic sinus infection (\$401,708)
- Google Impact Challenge to develop sensors and a mobile app to access and report real-time air quality data (\$250,000)
- Inhalable paclitaxel loaded-iron oxide nanoparticle for lung cancer therapy. Cancer Institute of New South Wales ECF (\$592,183)
- ARC LIEF (Macquarie University Lead) (\$440,000)
- NHMRC Project grant on influence of fat on bronchodilator effectiveness (Uni Newcastle Lead) (\$668,469)
- ARC Discovery to develop SmartDrop technology (\$521,800)

Core areas of research will be infection (upper and lower respiratory tract), innovative bronchiectasis and COPD therapies, lung cancer targeting, inhaled vaccines, quality use of medicines, high dose therapeutics, advanced particle design and novel approaches to treat of TB.

