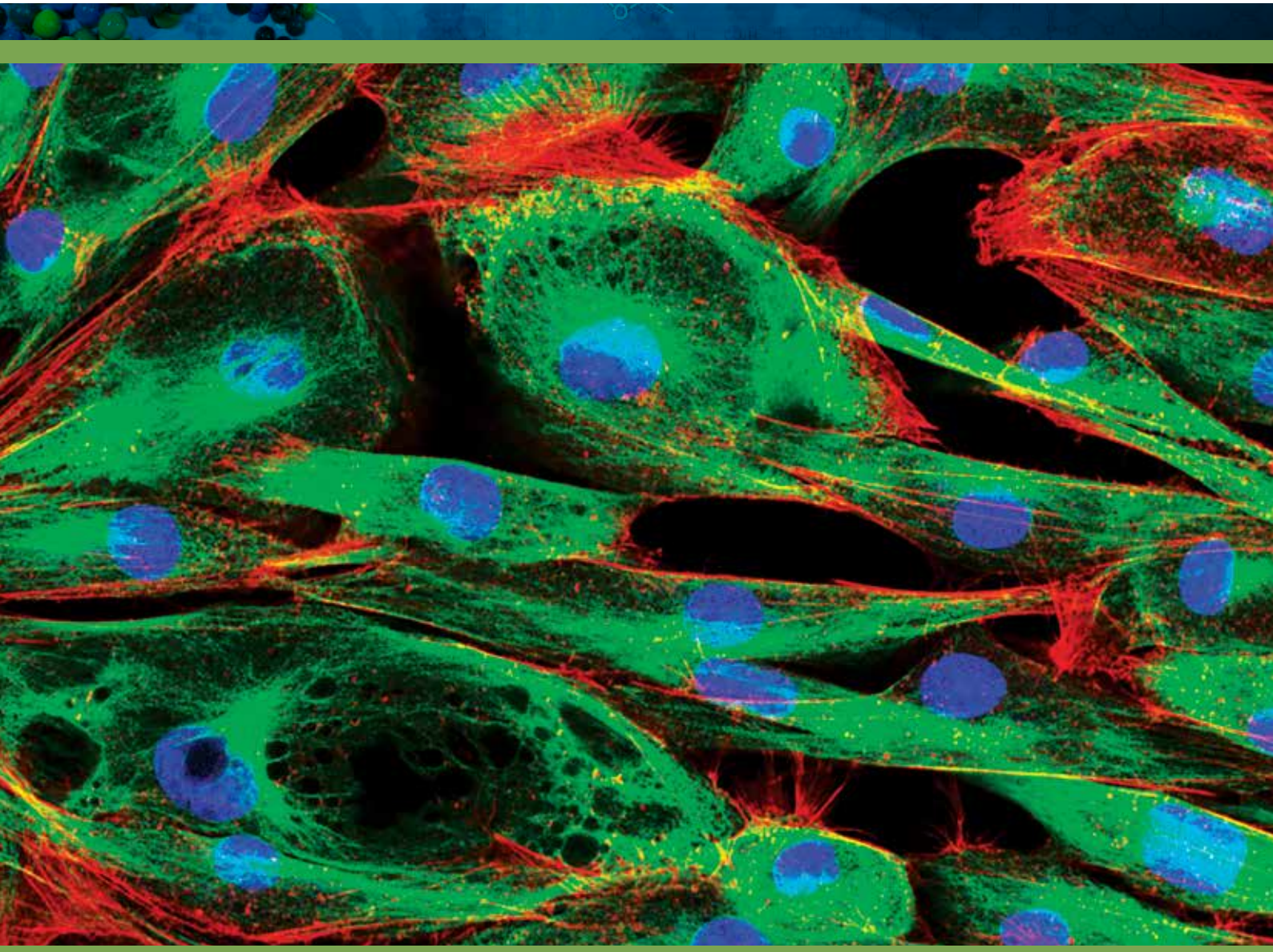
HEALY
MEDICAL RESEARCH FOUNDATION



Healy Medical Research Foundation

annual report

2016

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annual report 2016

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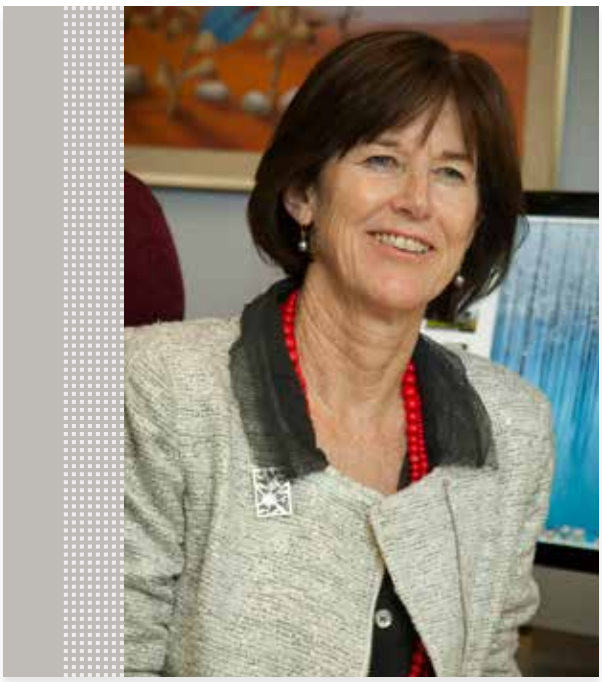
Chair's Address



It is my pleasure to present the research activities and funding position of the Healy Medical Research Foundation for 2016.

Established in 1970 through a generous bequest to The University of Western Australia by the late Patrick Burselum and Mary Estelle Healy, the Healy Medical Research Foundation is governed by a Deed of Trust, based on similar principles to the Raine Medical Research Foundation. It is administered by the same Research Committee and shares the same philosophy and commitment to medical research.

Mission Statement

In accordance with the terms of the Deed of Trust, income from the Capital Fund is intended for the purpose of: *seeking, diagnosing and investigating the nature, origin and causes of diseases in human beings and the prevention, cure, alleviation and combating of such diseases*.

Healy Research Collaboration Awards

The Healy Medical Research Foundation has a long history of supporting and advancing the careers of young investigators. In 2012 the Foundation introduced Research Collaboration Awards as a further commitment in support of early-career scientists. Since that time Healy has contributed in excess of $120,000 to encourage our young scientists to partner with national and international colleagues to further their research. These Awards are already showing significant benefits including: providing the opportunity for our early career researchers to visit top international research groups in their field; maximising knowledge and skill exchange; strengthening collaborative networks; submission of joint grants; co-authoring of published manuscripts; and achieving research outcomes that will progress to clinical translation. The Universities visited by our young scientists include Max von Pettenkofer Institut, LMU Muenchen, Germany and Texas A&M University, USA. The reports from their collaborative research and travel are on pages 6-7.

It is clear from the many success stories of young researchers supported by this program that the Research Collaboration Awards provide a valuable stepping stone to national and international success, through the facilitation of long-term collaboration and the promotion of research excellence.

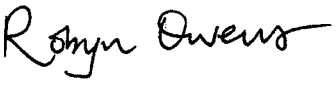
Financial Statement

The Healy Foundation has a sound capital base of approximately $1.4m and is well-placed to continue its annual commitment to medical research. It is pleasing to report that at this stage the annual distribution of funds to the Operational Account is sufficient to meet the continuation of our research activities and associated costs. This decision taken by the Raine Board will enable the consolidation and growth of the Healy Capital Fund.

I would like to take this opportunity to record my thanks and appreciation to the University office of Treasury and Investments for its high standard of financial management of the Healy portfolio in the administration of the Healy Foundation.

Research Committee

In concluding this address, I would also like to thank the members of our governing Board (Research Committee) for their commitment and willingness to oversee the research activities of the Foundation. We are fortunate to have a group of dedicated scientists, physicians and clinicians who bring a wealth of research knowledge and experience in the management of the Healy Medical Research Foundation. I look forward to working together to achieve another successful year in 2017.



Robyn Owens
UWA Deputy Vice-Chancellor (Research)
Chair, Research Committee

Research Committee

The Healy Medical Research Foundation is governed by a Committee of Senate, constituted in accordance with the requirements of the Deed of Trust. The 2016 Research Committee consisted of the following members:

Professor Robyn Owens
UWA Deputy Vice-Chancellor (Research) Chair

Professor David Joyce
Professor of Medicine

Professor Paul Norman
Professor of Surgery

Professor Ryan Lister
Professor of Biochemistry

Dr Sharan Dogra
Fellow, Royal Australasian College of Physicians

Mr Peter Smith
Fellow, Royal Australasian College of Surgeons

Dr Richard Choong
General Practitioner
Australian Medical Association
WA Branch Representative

Professor Mariapia Degli-Esposti
Head – Experimental Immunology
Centre for Ophthalmology and Visual Science
Research Committee nominee

Mr Garry Prendiville
Honorary Financial Consultant

Ms Lyn Ellis
Director

Dr Amanda Cleaver
Project Manager

Healy Research Collaboration Awards

The Research Committee introduced the Healy Research Collaboration Awards in 2012 to encourage early-career medical research scientists to establish and develop national and international research collaborations.

In 2017, two Awards were allocated with a total funding allocation of $19,474.

The Awards aim to increase opportunities for collaborative publications, joint grant submissions, sharing and advancement of research/clinical skills and industry linkages.

2016 Healy Research Collaboration Awards

	Chief Investigator	Project Title	Collaborating Institution
	Dr Aleksandra Debowski School of Biomedical Sciences, The University of Western Australia	Development of an inducible Helicobacter pylori cag-T4SS system for in vitro and in vivo studies	Max von Pettenkofer Institut, LMU Muenchen, Germany
	Dr Jessica Terrill School of Chemistry and Biochemistry, The University of Western Australia	Investigating the role of taurine in disease pathology of Duchenne Muscular Dystrophy (DMD) using the GRMD model	Texas A&M University, USA

2017 Healy Research Collaboration Awards

	Chief Investigator	Project Title	Collaborating Institution
	Dr Iona Schuster Lions Eye Institute	Characterizing innate lymphoid cells in steady state and infection	Memorial Sloan Kettering Cancer Centre, USA
	Dr Peijun Gong School of Electrical, Electronic and Computer Engineering, The University of Western Australia	Optical imaging of conjunctival lymphatics for better glaucoma treatment	Physiology and Pharmacology Centre, Lions Eye Institute Biomedical Optics Research Group, Simon Fraser University, Canada

Healy Research Collaboration Awards

PROJECT TITLE

Development of an inducible Helicobacter pylori cag-T4SS system for in vitro and in vivo studies

INVESTIGATORS

Dr Aleksandra Debowski (Chief Investigator)
Professor Dr Rainer Haas (Collaborating Partner)

SCHOOL/INSTITUTE/CENTRE

School of Biomedical Sciences, The University of Western Australia
Max von Pettenkofer Institut, LMU Muenchen, Germany (Collaborating Institution)

SUMMARY

Chronic H. pylori infection represents the major cause of gastroduodenal pathologies including gastric cancer. The Type IV secretion system (T4SS) injects CagA, a toxin produced by H. pylori, into gastric cells and has been implicated in carcinogenesis. The Mongolian gerbil model recapitulates gastroduodenal diseases caused by H. pylori and is well suited to studying H. pylori-induced pathologies. This study aimed to use the synergistic effect of combining the gerbil infection model with a H. pylori inducible gene regulatory system (developed at UWA) to elucidate the role that cag-T4SS has in the development and progression of gastric cancer and furthermore investigate whether carcinogenesis can be reversed or halted by inhibiting specific bacterial products.

My role was to oversee the construction of several conditional H. pylori mutants using an inducible genetic system. I also travelled to Germany to establish the experimental protocol for using the inducible system in the Mongolian gerbil infection model together with team members of the Haas laboratory.

OUTCOMES

Collaboration

The collaboration between Professor Haas and my research has resulted in the establishment of important working parameters for the inducible gene regulatory system in the Gerbil infection model, such as identifying the inducer dosing range that can effectively regulate H. pylori gene expression in the Gerbil stomach and the time required to alter gene expression from ON to OFF.

This collaborative work resulted in the successful generation of unique H. pylori strains that can be specifically controlled, by way of a small molecule inducer, in their ability to inject CagA toxin into host epithelial cells using the T4SS. Implemented in the gerbil, these strains serve as a unique tool for studying the temporal requirements of specific cag-T4SS genes in carcinogenesis and the specific roles different immune effectors play in driving H. pylori pathogenesis. More importantly, these strains also enable the investigation into whether gastric cancer caused by H. pylori can be reversed or halted by inhibiting specific bacterial products.

Dissemination of knowledge and expertise

Collaboration and personal exchange between our two groups facilitated the exchange of respective expertise in microbial genetics and different infection models. I transferred technology that was developed at UWA and oversaw its successful application in both in vitro and in vivo infection models in the Haas laboratory. I acquired ‘in house’ knowledge regarding cell culture infection models, which are invaluable skills for studying additional H. pylori virulence targets of interest and in assaying cag-T4SS function and activity.

One of the core outcomes of the Award was in the area of research training. As part of the exchange, the supervision and mentoring of a PhD student dedicated to the project was undertaken, allowing me to pass on the skills and knowledge I had acquired. It also allowed me to learn valuable supervision skills. The exchange also facilitated scientific discussion with other postdoctoral fellows and laboratory heads at the Max von Pettenkofer Institut, allowing me to develop important network connections within the scientific community.

PROJECT TITLE

Investigating the role of taurine in disease pathology of Duchenne Muscular Dystrophy (DMD) using the GRMD model

INVESTIGATORS

Dr Jessica Terrill (Chief Investigator)
Professor Joe Kornegay (Collaborating Partner)

SCHOOL/INSTITUTE/CENTRE

School of Chemistry and Biochemistry, The University of Western Australia
Texas A&M University, USA (Collaborating Institution)

SUMMARY

Duchenne Muscular Dystrophy (DMD) is a devastating disease with no cure. My research has focused on preclinical drug research for the disease using the mdx mouse model. A compound of interest, taurine, is highly effective in treating the murine condition, however the phenotype of the mdx mouse is mild. This Award has allowed me to continue my research using the GRMD dog model, the phenotype of which closely resembles that of DMD.

By collaborating with Joe Kornegay at Texas A&M University, USA, I have furthered my research in the use of taurine in DMD. The research facilitated by this Award gained preliminary data for the potential effectiveness of the amino acid taurine in treating muse from the GRMD model, and established a role of inflammation-derived oxidants in the pathology. This project continues, with several grants submitted to advance the research performed, which plan to perform a formal pre-clinical trial of taurine in GRMD dogs. This research is an essential step before we advance our research to clinical trials in DMD boys.

OUTCOMES

Collaboration

My research has focused on the use of the mdx model for Duchenne Muscular Dystrophy (DMD) to identify cellular mechanisms of pathology and potential therapeutic interventions for this fatal disease. However the mdx mouse is not an ideal model (with a very mild phenotype), and the preferred model, the GRMD dog model, that more closely resembles the human condition, is not readily available. This Award allowed me to travel to Texas A&M University, to establish a collaboration with Professor Joe Kornegay, an expert in the use of the GRMD model who has established a colony. Through this collaboration, we have planned grant applications, received archival samples that have been used to generate preliminary data for these applications, and I have gained expertise in pre-clinical research using this model. Additionally, we have firmly established a role of inflammation-derived oxidants in the pathology of GRMD muscle, and these data form the basis of much of our continuing research.

Dissemination of knowledge and expertise

This Award allowed me to develop essential skills for working with the GRMD model for DMD, to facilitate research in this model essential to the further assessment and development of the use of taurine as a treatment for DMD. Also, it allowed advancement of our knowledge of the role of inflammation-derived oxidants in the pathology of DMD.

Publications

This Collaborative Award has resulted in the publication of preliminary data into the role of inflammation-derived oxidants in the pathology of GRMD muscle, and the potential use of the amino acid taurine as a therapeutic intervention.

Terrill JR, Duong MN, Turner R, Le Guiner C, Boyatzis A, Kettle AJ, Grounds MD & Arthur PG (2016). Levels of inflammation and oxidative stress, and a role for taurine in dystropathology of the Golden Retriever Muscular Dystrophy dog model for Duchenne Muscular Dystrophy. Redox Biology 9, 276-286.

Grants

Research performed from this collaboration formed the basis for a Fellowship application and a Grant application submitted to the French Muscular Dystrophy Association (AFM-Téléthon), entitled “Functional readouts of neutrophil mediated oxidative stress as biomarkers in plasma and urine from the Golden Retriever Muscular Dystrophy dog model for Duchenne Muscular Dystrophy”. Results of these applications are due for release in 2017.

Financial Statement

P B HEALY MEDICAL RESEARCH BEQUEST
Statement for year ended 31 December 2016

	Notes	2016 Actual $	2015 Actual $
Capital Fund			
Opening Balance		1,352,847	1,294,838
LTP Distributions		110,934	58,009
		1,463,781	1,352,847
Less:			
Senate Policy Distributions to I&E	1		-
Closing Balance		1,463,781	1,352,847
Income & Expenditure			
Opening Balance		239,500	301,134
Senate Policy Distributions from Capital		-	-
STP Distributions		8,760	14,232
Total Income		248,260	315,366
Less Expenditure:			
Healy Travel Awards		(18,400)	(41,626)
Operating Expense		(23,070)	(34,240)
Closing Balance		206,790	239,500

Notes:
1 2015 – Agreed with committee in meeting held on the 12 November 2015 to suppress the 5% distribution from capital.

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