

Final Report: NZSG AbbVie Research Grant

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Summary

All aims of this research grant were successfully completed, ultimately leading to the development and proof-of-feasibility of gastric ablation as a potential new therapeutic tool for modulating gastric electrical dysrhythmias. The results of this work were presented at a national (NZSG) and international conference (Digestive Disease Week), and were awarded prestigious research awards at both conferences. A journal publication is currently in draft and nearing submission, and two additional funding applications are currently under review, building on the ground-breaking work that was enabled by this NZSG AbbVie Research Grant.

The research carried out under this grant has been instrumental in progressing world-class gastrointestinal electrophysiology research in New Zealand, and now holds great promise toward future clinical application. ***We sincerely thank the NZSG and AbbVie for funding and enabling this pioneering research.***

Outcome of Research Aims

Under this grant, we completed 10 pig studies of gastric ablation, generating >50 high-resolution (256-channel) gastric electrical recordings. These recordings encompass >10 hours of total recorded electrophysiology data, containing >500,000 individual electrical 'slow-wave' activation events. We also collected 36 tissue samples of excised gastric ablation lesions, and completed histological imaging and analysis of those samples.

The data generated through this grant has successfully pioneered gastric ablation as a novel therapeutic option for modulating gastric electrical 'slow-wave' activity, and has successfully achieved each of the aims outlined in the initial grant application. Specifically, we have:

1. Adapted cardiac ablation strategies to achieve ablation of gastric smooth muscle.
2. Utilised gastric ablation to achieve electrical block of slow-wave conduction, verified by high-resolution gastric electrical mapping.
3. Utilised targeted gastric ablation at sites of electrical dysrhythmia, identified by high-resolution mapping, to modulate dysrhythmic conduction pathways.

Variation(s) from Original Grant Application

Our initial experimental studies were overwhelmingly successful, and generated more data per animal than originally anticipated. Consequently, we did not require as many animal studies as originally planned and budgeted. We therefore applied to the NZSG for a budget reallocated and extension, to employ two student research assistants to comprehensively analyse the vast data generated under the initial studies. Additionally, the initial results were not ready in time to submit to the ESNM 2015 conference (July 2015), as initially budgeted for, so we also requested to reallocate that funding toward the Digestive Disease Week 2016 conference (May 2016, San Diego, USA).

We thank the NZSG for approving our budget reallocation and extension. We secured 2 excellent German graduate students to take up 10-week research assistantships in January - March, 2016, which produced additional data and valuable analysis. We also submitted an abstract to the 2016 Digestive Disease Week conference in San Diego, CA, USA, which was selected for a poster presentation and was awarded a Young Investigator Award from the American Gastroenterological Association.

Outputs

Ultimately this funding has enabled work that has been presented at multiple conferences (national and international), received 2 research awards, generated one publication to date (in draft), and has shown feasibility of gastric ablation that will enable substantial additional publications and grant applications. Specific outputs are detailed below:

- Conference oral presentation, 2015 NZSG conference (November 2015, Rotorua). Awarded ‘Best Luminal Paper/Presentation’ award.
- Conference poster presentation, 2016 Digestive Disease Week conference (May 2016, San Diego, USA), which featured attendance of ~16,000 international scientists and clinicians. Awarded a Young Investigator Award by the American Gastroenterological Association.
- A journal publication is currently in draft with anticipated submission by the end of 2016.
- Two additional grant applications are currently in submission that build on the foundational data generated through this NZSG AbbVie Research Grant.

This grant has been instrumental in enabling the foundation of a new research program in gastric electrical therapy through gastric ablation.

Expenditures

Salary–Research Assistant (Maria Herrera Quesada)	\$ 5,468.19
Salary–Research Assistant (Berit Krohn)	\$ 6,128.09
Salary–Research Assistant (Lisa Reigger)	\$ 6,141.37
ACC	\$ 73.61
Annual Leave expense	\$ 90.16
Computer Accessories	\$ 782.46
Asset-Lab Workshop	\$ 19.20
Consum-Lab/Workshop	\$ 2,187.91
Consum-Supply&Serv	\$ 9.68
Animal Costs (Pigs)	\$ 3,825.95
Hire of Equip & Facilities	\$ 1,490.00
Conference Fees	\$ 1,165.25
Accommodation Conf	\$ 518.87
Accom Long Haul	\$ 3,461.23
Conf Airfare	\$ 2,800.29
Travel-Meals/Incidentals	\$ 201.70
Travel-Mileage Allowance	\$ 338.92
Staff Catering	\$ 87.12
TMC Fee (related to travel)	\$ 210.00
Total Expenses	<u>\$ 35,000</u>

Conclusions

This grant has enabled the research and development of gastric ablation as a novel therapeutic technique for modulating gastric dysrhythmias, where limited or nil proven therapeutic options currently exist. All of the aims of this grant have been met, and initial research outputs have been achieved, which were awarded two prestigious research awards. We anticipate that the research conducted under this grant will enable substantial further research outputs and funding well into the future.

Furthermore, this grant has helped to establish and build the relatively-young research career of Tim Angeli, the PI of the grant, who is only a three years removed from his PhD. I sincerely thank the NZSG and AbbVie for believing in my ability to deliver this research, and awarding me the opportunity to further establish my research career in New Zealand.

We sincerely thank AbbVie and the New Zealand Society of Gastroenterology for this funding and for enabling this pioneering research.