

The origin and objectives of the Rumen Microbial Genomics Network

Adrian Cookson

RMG Network Co-ordinator (to June 2013)

Global Research Alliance (GRA) on Agricultural Greenhouse Gases

- The GRA was formed at the 2009 UN climate change conference in Copenhagen www.globalresearchalliance.org
- It aims to bring countries together to find ways to produce more food without growing greenhouse gas emissions.
- GRA efforts are led by three research groups
 - (i) livestock, (ii) croplands and (iii) paddy rice
 - and two cross-cutting groups (i) C & N cycling and (ii) Inventories & Measurement.
- The Livestock Research Group (LRG)
 - co-chaired by NZ and the Netherlands
 - focused on reducing greenhouse gas emission intensity and improving overall production efficiency of livestock systems.

Rumen Microbial Genomics Network

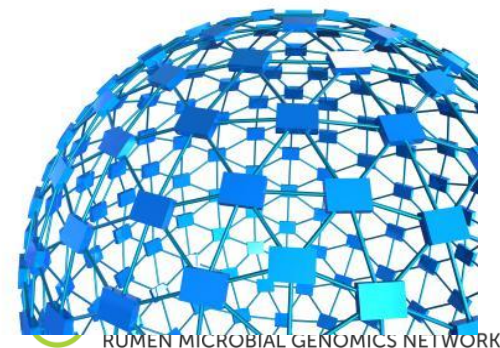
- RMG Network is an initiative of the LRG.
- Sept 2010: RMG Network identified as a project in LRG work plan.
- Dec 2010: AgResearch obtained funding from NZ Government to hold an exploratory workshop.
- Feb 2011: workshop held and RMG Network formed.

Aim of workshop: *To initiate an international scientific effort to mitigate methane using a rumen microbial genomics approach by gathering together the main research groups active in methanogen genomics and rumen metagenomics to align international research in this area.*



Perceived Network benefits.

- Communication and collaboration between international research groups.
- Lobby/leverage for international funding (larger integrated studies).
- Open access to data – avoid duplication.
- Sharing and identification of new molecular genomics tools.
- Raise public awareness of present and future research activities.
- Generation of comprehensive reference genome and metagenome sequence libraries for relevant microbial communities.
- Exchange of students, staff.



Workshop Feb 2011.

International workshop held in Palmerston North with participants from New Zealand, Australia, Europe, North America, South America and Japan.



Purpose - To initiate support for global collaborative network of researchers, working with common set of principles and guidelines to underpin the development of methane mitigation and rumen adaptation technologies using microbial genomics approaches.

Rumen Microbial Genomics Workshop - agreements.

- Proposed global network structure universally accepted.
- Network to be initially led and co-ordinated by New Zealand.
- Endorsement of three collaborative projects (deep sequencing of rumen metagenome, catalogue of reference microbial genomes, functional genomics).
 - Having far-reaching positive impacts for RMG research community to develop GHG mitigation technologies.
 - Aligning well with underpinning 'global' rationale of GRA.
 - Having clear practical outputs to network aims.



Rumen Microbial Genomics Network structure.

- Open and inclusive membership for those willing to contribute in some way.
- Modelled on other international networks e.g. Human Microbiome project.
- Subsequent Network leadership through international Working Group (international scientists in RMG science community).
 - Establish protocols/guidelines.
 - Manage IP expectations.
 - Communication/publicity.

Formation of RMG Network.

- Funding received Dec 2011 to administer and run RMG Network to June 2013.
- RMG Network Structure document in scope.
- Website available containing:
 - Links to partner programs (RuminOmics and SMEthane).
 - Further information and links to underpinning projects (H1000 and GRC).
 - Various pipelines, protocols and links.
 - News, publications, RMG Network newsletters (Dec 2012, May 2013).
 - Member details.
 - Members forum.

Key RMG Network performance indicators.

- Successful formation of International RMG Network Working Group.
- Adoption of agreed and robust RMG Network Implementation Plan.
- Co-ordinated leadership and administration of global Network projects.
- Expansion of international RMG Network members.
- Mobilising additional resources:
 - Global Partnerships in Livestock Emissions Research – NZ.
 - Dept of Agriculture, Fisheries and Forestry; Filling the Research Gap - Australia
 - FACCE-JPI – International.
- 2nd RMG Network workshop (Clermont-Ferrand, June 2012).
- Succession of NZ leadership and co-ordination of RMG Network to another Alliance country (2013).



RMG Network process - reflection.

- *Workshop* - early face-to-face engagement of potential collaborators (research and technical expertise) is important.
 - provides opportunity for feedback on network initiative.
 - perfect launch pad for subsequent research initiatives.
- Initial financial support from government for global science initiative with global aspects and deliverables was essential.
- Good understanding of science and political aspirations.
- Strong advocacy and support from proactive research community.



Acknowledgements.



- All RMG Network members, workshop participants and attendees.



- www.rmgnetwork.org.nz
- rmg.network@agresearch.co.nz
- adrian.cookson@agresearch.co.nz

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Suggested break-out session topics.

- What's the role of culture-based methodologies to support functional investigations driven by Rumen Microbial Genomics datasets?
- Taxonomy of the rumen microbiome – will the lack of understanding in this area limit progress?
- RMG Network discussion paper: NZ Government funding for leadership of Network ceases on 30th June 2013.
 - What have been the benefits for Network members?
 - Continue in current form led by a different country?
 - Streamlined RMG Network maintained through on-going international collaborative projects?
 - Has RMG Network purpose been fulfilled – on-going benefits realised through other projects?