Working Together for Animal Health – Global Coordination of Animal Disease Research

Alex Morrow
STAR-IDAZ

(Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses)

A global initiative to address the coordination of research programmes at international level in the area of animal health and in particular infectious animal diseases including zoonoses.
STAR-IDAZ Outputs/Achievements

• A database of research publications
• A research programmes database (including capacity and activities)
• Research needs at global, regional and industry sector levels established
• Agendas on target priority diseases and issues developed
• Instruments to enable cooperation, clustering and partnerships identified
• Development of a long-term Strategic Research Agenda

• An extensive network of research programme managers developed
STAR-IDAZ IRC

Higher level of commitment for coordinated research activities through the STAR-IDAZ International Research Consortium for Animal Health (IRC)

• Agree minimum level of investment in research on priorities over a five year period (threshold $US 10 million; group funding commitment possible)
• Agree delivery targets
• Agree to coordinate/align funding to deliver these targets (members' own funding procedures, unless agreed otherwise; governance document & policy guidelines)
• Agree to share research results (as much as necessary, without jeopardising IPR)
• 22 Partners from 14 countries including one international research organisation (ILRI), one charity (BMGF), the European Commission and three industry bodies have signed the Letter of Intent to participate.
• Total combined research budget of $US 2.5+ billion
Objective of STAR-IDAZ IRC

To coordinate research at international level to contribute to new and improved animal health strategies for at least 30 priority diseases/infections/issues

The deliverables include:

- Candidate vaccines
- Diagnostics
- Therapeutics
- Other animal health products and procedures
- Key scientific information/tools to support risk analysis and disease control
IRC Signatories

1. Danish National Veterinary Institute (DTU Vet), Denmark
2. The French Agency for Food, Environmental and Occupational Health & Safety (ANSES), France
3. National Institute of Agricultural Research (INRA), France
4. Ministry of Health, Italy
5. Ministry of Economic Affairs (MinEZ), The Netherlands
6. National Institute for Agriculture and Food Research and Technology (INIA), Spain
7. Biotechnology and Biological Science Research Council (BBSRC), UK
8. Department for the Environment, Food and Rural Affairs (Defra), UK
9. National Institute of Agriculture Technology (INTA), Argentina
10. Ministry of Science, Technology and Productive Innovation (MINCYT), Argentina
11. Canadian Food Inspection Agency (CFIA), Canada
12. Agriculture Research services, United States Department of Agriculture (USDA ARS), US
13. National Institute of Animal Health, National Agriculture and Food Research Organisation (NIAH), Japan
15. Kimron Veterinary Institute, Israel
16. Tanzania Veterinary Laboratory Agency (TVLA), Tanzania
17. Zoetis
18. European Manufacturers of Veterinary Diagnostics (EMVD)
19. HealthforAnimals
20. STAR-IDAZ.be Regional Consortium; Universiteit Gent (Ghent University), Université de Liège, the Federal Public Service Health, Food Chain Safety and Environment (unit Contractual Research) and CODA-CERVA (Veterinary and Agrochemical Research centre)
21. Bill and Melinda Gates Foundation (BMGF)
22. The European Commission
“We welcome the establishment of the STAR-IDAZ International Research Consortium on animal diseases and high priority vaccines”.

G20 Ministry of Agriculture Chief Scientists (MACS) - Beijing, May 2016
Scientific Committee

Don Knowles
Dieter Schillinger
Gary Entrican
Martin Beer
Edwin Claerebout
Wim van der Poel
Denis Kolbasov
Stéphan Zientara

Bruno Goddeeris
Clara María Marín Alcalá
Gustavo Zielinski
Glen Gifford
Jeremy Salt
Anette Bøtner
Irit Davidson
Sergio Rosati

USAHA San Diego Oct ‘17
Working Groups

- Porcine Reproductive and Respiratory Syndrome
- Influenza
- Bovine tuberculosis
- Foot and Mouth Disease
- Brucellosis
- African Swine Fever
- Vector-borne diseases
- Corona viruses
- Mastitis
- Helminths including anthelmintic resistance
- Porcine respiratory disease
- Pox virus infections
- Others to come

- Vaccinology
- Emerging issues
- One Health (including food-borne pathogens and AMR)
- Animal genetics/genomics for animal health
- Epidemiology
- Diagnostics (tools and technologies)
- Innovative anti-infective approaches, including alternatives to antimicrobials
Vaccines

- Characteristics of an acceptable versus ideal vaccine
- Limitations of current vaccines (expectations)
- Research needs to improve current vaccines
- Research needs to deliver new/novel vaccines
- Cross-cutting issues with other areas
- Research priorities
Diagnostics

- Limitations of current diagnostics (expectations)
- Research to improve current diagnostics
- Research needed to deliver new/novel diagnostics
- Cross-cutting issues with other areas
- Research priorities
Host pathogen interactions

- Gaps in knowledge relating to M. bovis (pathogen biology)
- Host susceptibility, including carrier state
- Host immune response to M. bovis, including immunopathology
- Cross-cutting issues with other areas
- Research priorities
Bovine TB Research Gap Analysis and Prioritisation Workshop

Epidemiology

• Wildlife ecology
• Global burden of disease
• Cost of disease and benefits of control options
• Human Impact
• Cross-cutting issues with other areas
• Research priorities
# bTB Research Gaps

<table>
<thead>
<tr>
<th>Research area</th>
<th>Gaps</th>
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<tbody>
<tr>
<td>1. Diagnostics</td>
<td></td>
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<tr>
<td>1.1. General tests</td>
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<tr>
<td>1.1.a.</td>
<td>Diagnostic tests for species other than cattle</td>
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<td></td>
<td>False negative results</td>
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<td></td>
<td>Increased sensitivity to detect mycobacteria in biological samples (including faeces)</td>
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<td></td>
<td>Biomarkers in addition to or substitution of IFN-γ</td>
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<tr>
<td></td>
<td>Detection of specific mycobacterial antigens</td>
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<tr>
<td></td>
<td>Improved IGRAs</td>
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<td></td>
<td>Improve skin test</td>
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<tr>
<td>ST</td>
<td>List and characterise different types of PPD and strains used in each country/region/continent</td>
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<tr>
<td></td>
<td>Tuberculin standardisation - need for defined skin test reagents</td>
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<tr>
<td>BR/LT</td>
<td>Develop synthetic reagents to use in place of PPD</td>
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<tr>
<td>BR/LT</td>
<td>Development of a non-sensitising skin test in association with vaccination.</td>
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<td></td>
<td>Need to develop a better potency test</td>
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<td>ST</td>
<td>Further research to develop targeted enrichment approaches to concentrate samples for diagnostic purposes.</td>
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Global Research Alliance for Bovine TB (GRAbTB)

**Vision**
A coordinated global research alliance enabling improved understanding and control of bovine TB

**Mission**
To establish and sustain global research partnerships that will generate scientific knowledge and tools to contribute to the successful control and eradication of bovine TB
Global Research Alliance for Bovine TB (GRAbTB)

**Strategic Goals**

**Goal 1.** Identify research opportunities and facilitate collaborations within the Alliance

**Goal 2.** Conduct strategic and multi-disciplinary research to better understand bovine TB

**Goal 3.** Develop novel and improved tools to control bovine TB

**Goal 4.** Serve as a communication and technology sharing gateway for the global bovine TB research community and stakeholders

**Goal 5.** Promote collaboration with the human TB research community
Global FMD Research Alliance

VISION OF GFRA
A coordinated global alliance of scientists producing evidence and innovation that enables the progressive control and eradication of FMD.

MISSION OF GFRA
To establish and sustain global research partnerships to generate scientific knowledge and discover the tools to successfully prevent, control and eradicate FMD.

PROGRAMS OF GFRA
GFRA aims to expand FMD research collaborations worldwide and maximize the use of resources and expertise to achieve its five strategic goals (see below).

Several research programs are currently active in Europe, North America, South America and South-East Asia. GFRA programs will continue to expand the alliance in these areas and will actively reach out to new areas of the world that have a stake in the progressive control and eradication of FMD.

STRATEGIC GOALS OF GFRA
- **Goal 1.** Facilitate research collaborations and serve as a communication gateway for the global FMD research community
# Brucellosis Research Gaps

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<tbody>
<tr>
<td>1. Diagnostics</td>
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<tr>
<td>1.1 General</td>
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<tr>
<td></td>
<td>Conventional typing is difficult and poses reproducibility problems</td>
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<td></td>
<td>Detection of latently infected animals is important</td>
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<td>Differentiation between exposed, infected, and infectious</td>
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<td>1.2 Serological</td>
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<tr>
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<td>Lack of information on the performance of serological tests in swine</td>
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<tr>
<td></td>
<td>- <strong>Improved diagnostics for swine</strong>, including evaluation of conventional tests</td>
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<td>Lack of limited information on performance of tests in camels, yaks, water buffaloes and wildlife</td>
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<tr>
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<td>- Test validation (including evaluation of conventional tests - RBPT &lt; CFT &amp; ELISA) test development for camels, yaks, water buffaloes</td>
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<td>- Improved tests for human and canine brucellosis</td>
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<td>- Develop tests to diagnose smooth and rough strains in the same test</td>
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<td><strong>Identification of immunodominant antigen of diagnostic significance</strong></td>
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<td>- Gene expression in vivo for antigen identification</td>
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<td>- Evaluation of potential protein antigens for eliminating FPSR, including cross-reactivity with other bacteria</td>
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<td>- Validating ELISA's based on the M antigen</td>
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<tr>
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<td>- Validate the skin test to discriminate true brucellosis from FPSR</td>
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*ongoing*, *planned*, *collabor.*
An avenue in the Brucella Research Roadmap...

- **Brucella vaccine**
  - Identify protective antigens
  - Identify protective pathways
  - Role of immune effector cells
  - Identify correlates of protection

- Genetic modification to remove stealth mechanisms and virulence
- Identify stealth mechanisms
- Identify virulence mechanisms
- Gene expression under different in vivo environments
SIRCAH

“Secretariat for the International Research Consortium on Animal Health”

Partners
DEFRA
BBSRC
OIE
CABI
IFAH-EUROPE
SIRCAH Activities

- Establish working groups for priority diseases and crosscutting issues - assisting with the organisation of meetings, including helping to pull together the gap analysis and mapping funding activities against identified research needs.
- Produce and publish gap analysis and roadmap reports from working groups.
- Advise the Scientific Committee (SC) and ExC on how research programmes could be aligned and make funding recommendations based on the gap analysis, roadmap reports and current funding activities.
- Help mobilise resources - bringing together funding bodies and helping to identify funding opportunities
- Facilitating knowledge transfer to bring innovation to the market
Contact us

For further information on:

- STAR-IDAZ IRC visit www.star-idaz.net.
- CWG AH&W visit http://www.scar-cwg-ahw.org/ 

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Thank You For Your Attention

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