



Global Coordination of Animal Disease Research

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Focus of Presentation

- **Background to STAR-IDAZ**
- **Activities and outputs/outcomes of STAR-IDAZ**
 - **Priority topics**
 - **Long-term research needs**
- **Plans for future development**



“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 Objectives

- Strengthen the linkages between and reduce the duplication of global research effort on high priority infectious diseases of animals (including zoonoses), maximise the efficient use of expertise and resources and accelerate coordinated development of control methods.
- Identify and co-ordinate the response to gaps in research activities for targeted diseases/issues.
- Create the necessary critical mass and capacity to address emerging infectious disease threats.

STAR-IDAZ Objectives (continued)

- **Improve the cost-effectiveness and added value to network partners of current research programmes.**
- **Develop durable procedures for a better co-ordinated, rapid response to urgent research needs.**
- **Identify unique regions with localised diseases and improve access to research in those areas.**
- **Improve access to and the utility of research results across all partner organisations.**

Scope of STAR-IDAZ

Coordination of research relevant to:

- **Emerging and major infectious diseases of production animals (livestock, including aquatic animals and bees).**
- **Zoonoses.**
- **Diseases of wildlife and other free-living animals if identified as reservoirs of infection of emerging and major infectious diseases of humans or production animals.**

Project Activities – working at different levels

- **Sharing information on existing research programmes.**
- **Analysis of and responding to global, regional and industry sector priorities.**
- **Facilitating networking of on-going research activities on major issues.**
- **Developing strategic trans-national animal health research agendas.**

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

Preliminary Inventory of Research Activities and Priority Research Needs - Q1 - 3

Indicate, in order of importance:

1. The six diseases/health issues and associated research activities relating to the XXXXX sector that are currently the subject of greatest research effort in your country.
2. The current six most important diseases/health issues affecting the XXXXX sector in your country and the associated research needs
3. The six most important disease/health threats to the XXXXX sector in your country and the associated research needs.

Preliminary Inventory of Research Activities and Priority Research Needs - Q7

Taking into account your responses relating to the various livestock sectors please indicate, in order of importance what you consider to be the ten priority areas in your country where further research is needed.

Research Needs (Diagnostics; Vaccines; Therapeutics; Epidemiology and Control; Host Pathogen Interactions)

Top Ten Priorities Identified by STAR-IDAZ Partners (Q7)

Influenza

TB

FMD

Salmonella

Antimicrobial Resistance

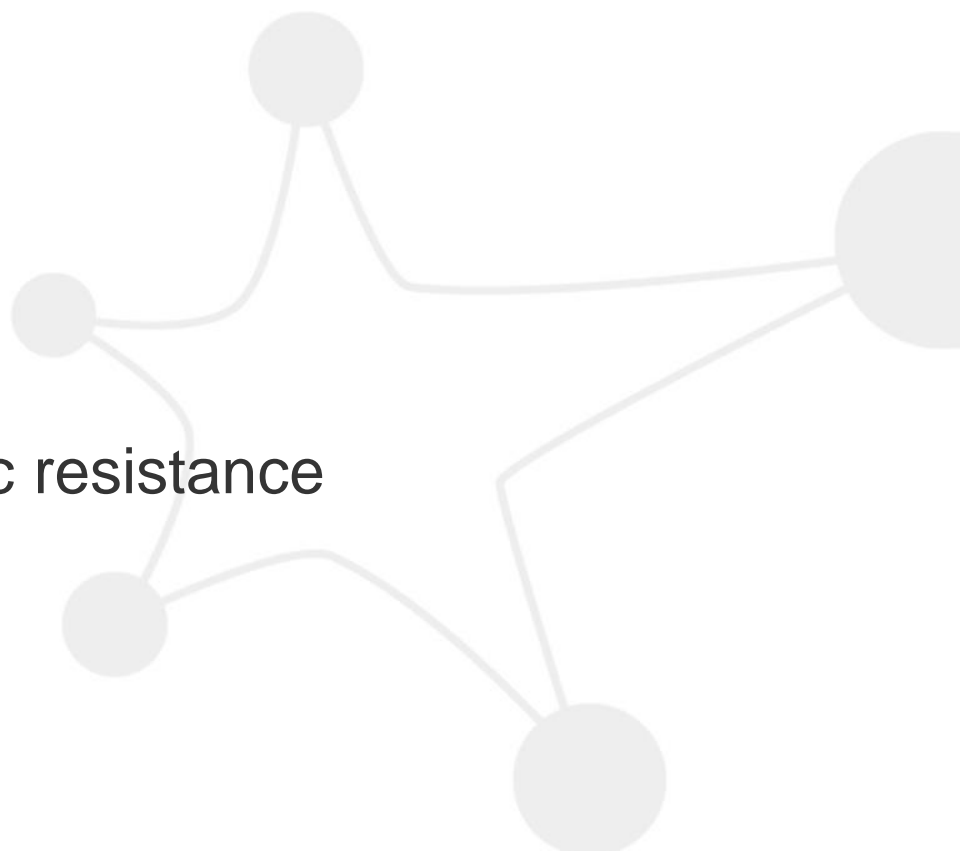
Brucellosis

Parasitosis and anthelmintic resistance

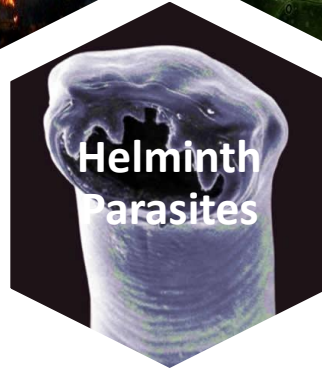
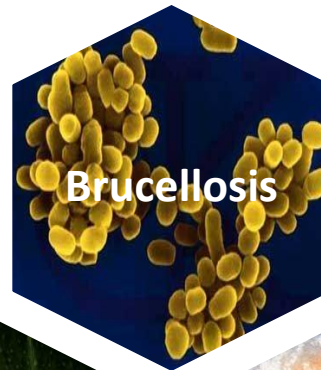
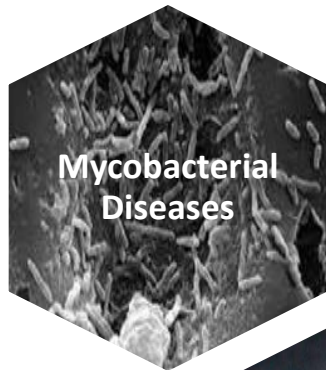
Campylobacter

Classical swine fever

PRRSV



Research Priorities



Global FMD Research Alliance



Global Foot-and-Mouth Disease (FMD) Research Alliance



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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



Global African Swine Fever Research Alliance



Global African Swine Fever
Research Alliance



Fighting African Swine Fever Together

Bovine TB Research Gap Analysis and Prioritisation Workshop

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

Bovine TB Research Gap Analysis and Prioritisation Workshop

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**

Bovine TB Research Gap Analysis and Prioritisation Workshop

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

Research area	Gaps	[Organisation 1 name]		
		ongoing ^a	planned ^b	collabor. ^c
1.	Diagnostics			
1.1.	General tests			
1.1.a.				
	Diagnostic tests for species other than cattle			
	False negative results			
	Increased sensitivity to detect mycobacteria in biological samples (including faeces)			
	Biomarkes in addition to or substitution of IFN- γ			
	Detection of specific mycobacterial antigens			
	Improved IGRAs			
	Improve skin test			
ST	List and characterise different types of PPD and strains used in each country/region/continent			
	Tuberculin standardisation - need for defined skin test reagents			
BR/LT	Develop synthetic reagents to use in place of PPD			
BR/LT	Development of a non-sensitising skin test in association with vaccination.			
	Need to develop a better potency test			
ST	Further research to develop targeted enrichment approaches to concentrate samples for diagnostic purposes.			

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

PPRSV Research Gaps

Research area	Gaps	[Organisation 1 name]		
		ongoing ^a	planned ^b	collabor. ^c
1.	Diagnostics			
1.1.	<i>Serological</i>			
1.1a	Development of differential ELISAs to allow detection of different strains (Type 1, Type 2 and High Path)			
1.1b	Potential and limitations of the use of oral fluids for the virological and serological diagnosis			
	Analysis of PPRV herd immune status using oral fluid samples			
1.1c	Pen-side tests for antigen/antibody detection			
1.1d	Strain divergence and diagnostics			
	System for the reliable and rapid detection of new strains			
1.1e	Multiplex platforms			
1.1f	DIVA test			
	Tests to assess immune status and protection			
1.2.	<i>Molecular diagnostics</i>			
1.2.a.	PCRs for detection of all strains			
2.	Vaccines			
2.1.	<i>Vaccine development</i>			
2.1a	More effective vaccines			
2.1b	Oral/nasal vaccines that give a local immunity at the place of entry			
2.1c	Development of marker vaccines together with differential ELISAs			
2.1d	Development of farm-specific vaccines			
2.1f	Safe adaptable attenuated and vector vaccines			
2.1e	Vectors			

Long-Term Research Challenges in Vaccinology

- Pathogen diversity, emergence and re-emergence of pathogens will remain a challenge for effective vaccination
 - Complex bacteria and parasites
- Veterinary vaccinology research **has to be** focused on **adopting new developments in technology**
- **Insufficient use of new technologies** to design vaccines for the purpose intended; e.g., prevent transmission, DIVA
- Future research should be aimed at developing vaccines that **approach the ideal as closely as possible** and which are directed against diseases not yet controlled by vaccination and against newly emerging diseases

Veterinary Vaccinology Research Alliance

Vision

A coordinated global research alliance **facilitating** the development of novel and/or improved' veterinary vaccines

Mission

To establish and sustain global research partnerships that will generate scientific knowledge and tools to contribute to the successful development of novel and/or improved' vaccines

Veterinary Vaccinology Research Alliance

Strategic Goals

Goal 1. Identify research opportunities and facilitate collaborations, **sharing tools and reagents and resources**/facilities within the network

Goal 2. Facilitate international efforts to better understand the **underpinning immunology** and address the unmet needs in **protective immunity** in the field of veterinary vaccinology

Goal 3. Provide a forum for continued identification of research priorities and gaps

Veterinary Vaccinology Research Alliance

Strategic Goals

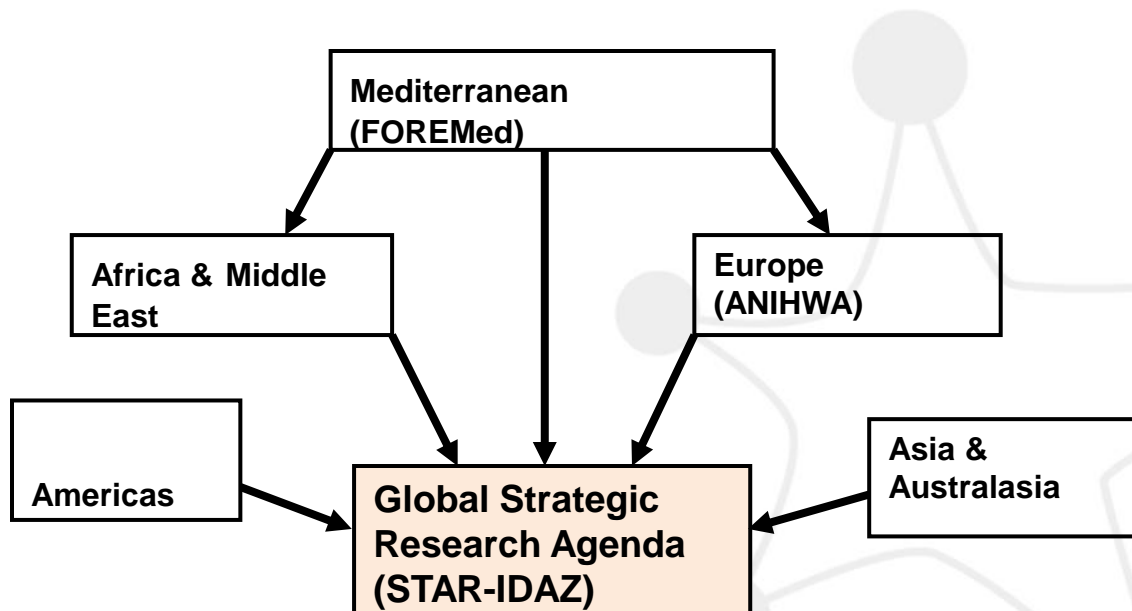
Goal 4. Foster a multi-disciplinary community to **develop and enhance the uptake of new tools and technologies**

Goal 5: Promote collaboration with the human vaccinology research community (One Health approach)

Goal 6. Serve as a **communication and technology sharing gateway** for the global vaccinology research community and stakeholders

Foresight Activities

Objective: To identify the scientific and technological needs to prevent, control or mitigate animal health and zoonotic challenges for the next 20 years



Foresight activities and methodologies

REGIONAL WORKSHOPS:

- Americas: scenario consideration
- Asia & Australasia: 7 questions
- Europe: scenario building and back-casting

- Moscow Workshop: Driver – disease interactions.
Backcasting to a preferred future - *Animal disease minimised or rapidly contained ensuring a safe and secure food supply.*

Summary of Combined Results

Structural/Political/Capacity – Box 1

Research pipeline – investment in basic research

Sound public policies relating to science and technology

Maintenance of capacity

Partnerships/collaborations

Knowledge management system

Knowledge/technology transfer

Integrated surveillance system/ Centralised diagnostic testing

Summary of Combined Results

Technology – Box 1

Diagnostic tests - Express methods

Vaccine development/New genetically engineered vaccines

Alternatives to antimicrobials

Alternative methods to control vectors

Biosecurity

Systems based approaches/research

Summary of Combined Results

Specific topics/disease challenges - Box 1

Improved Understanding of the role of wild life

Vector-borne diseases

Antibiotic effectiveness and availability

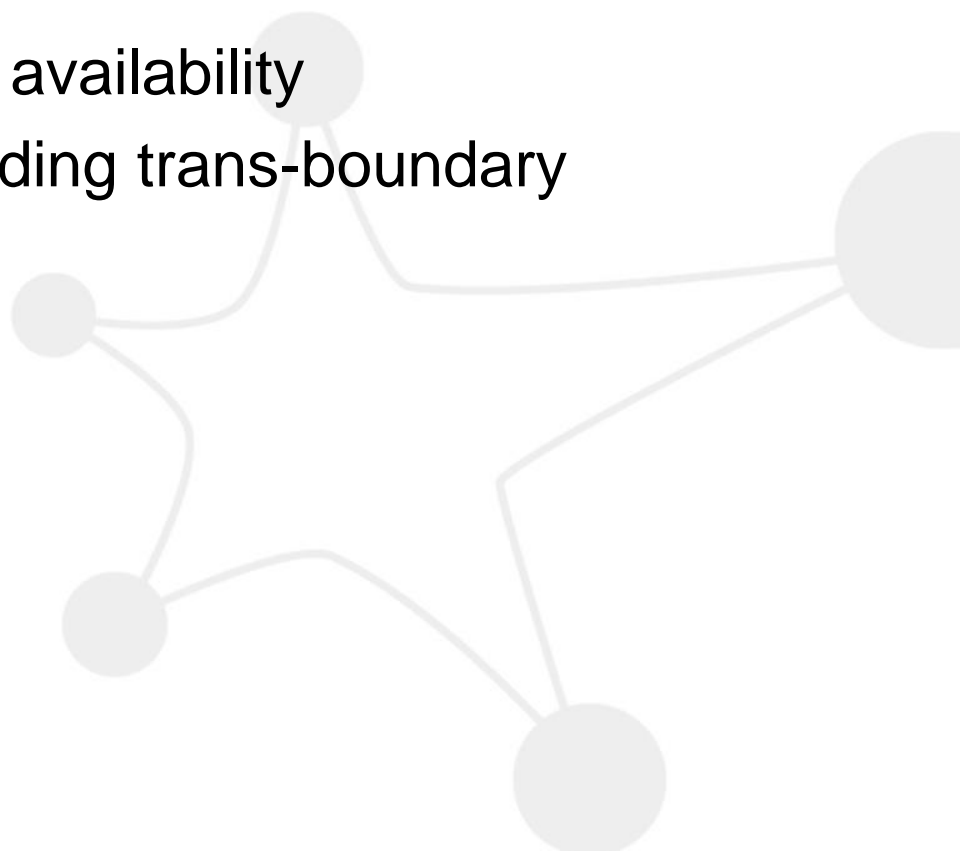
Disease introductions, including trans-boundary animals diseases

Improve food safety

Gut health

Anthelmintic resistance

New diseases



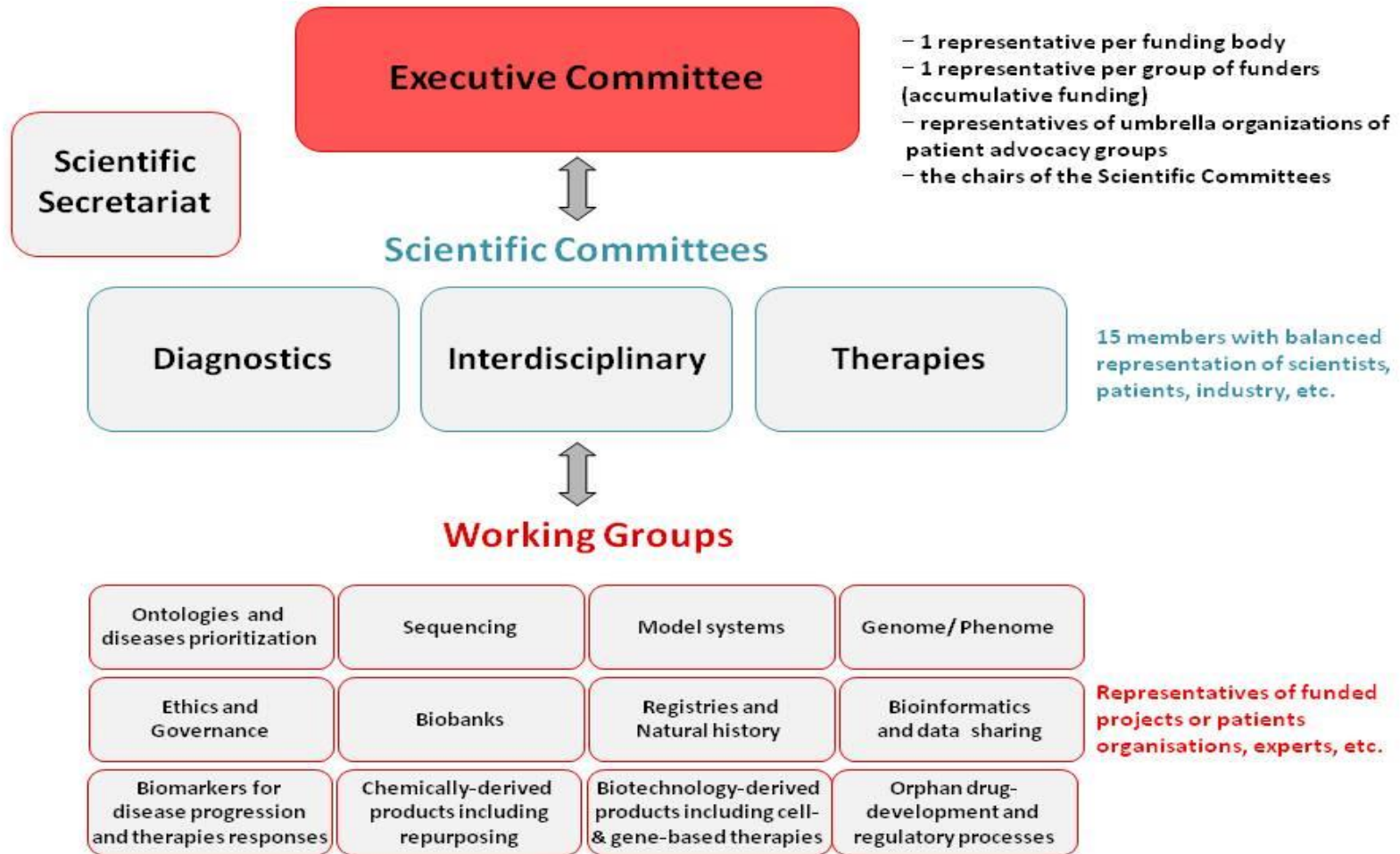
G20 Ministry of Agriculture Chief Scientists (MACS) meeting

A working group to explore the alignment of research priorities and collaboration with the aim of reducing gaps and avoiding duplication, focusing on animal diseases, in particular high priority vaccines.

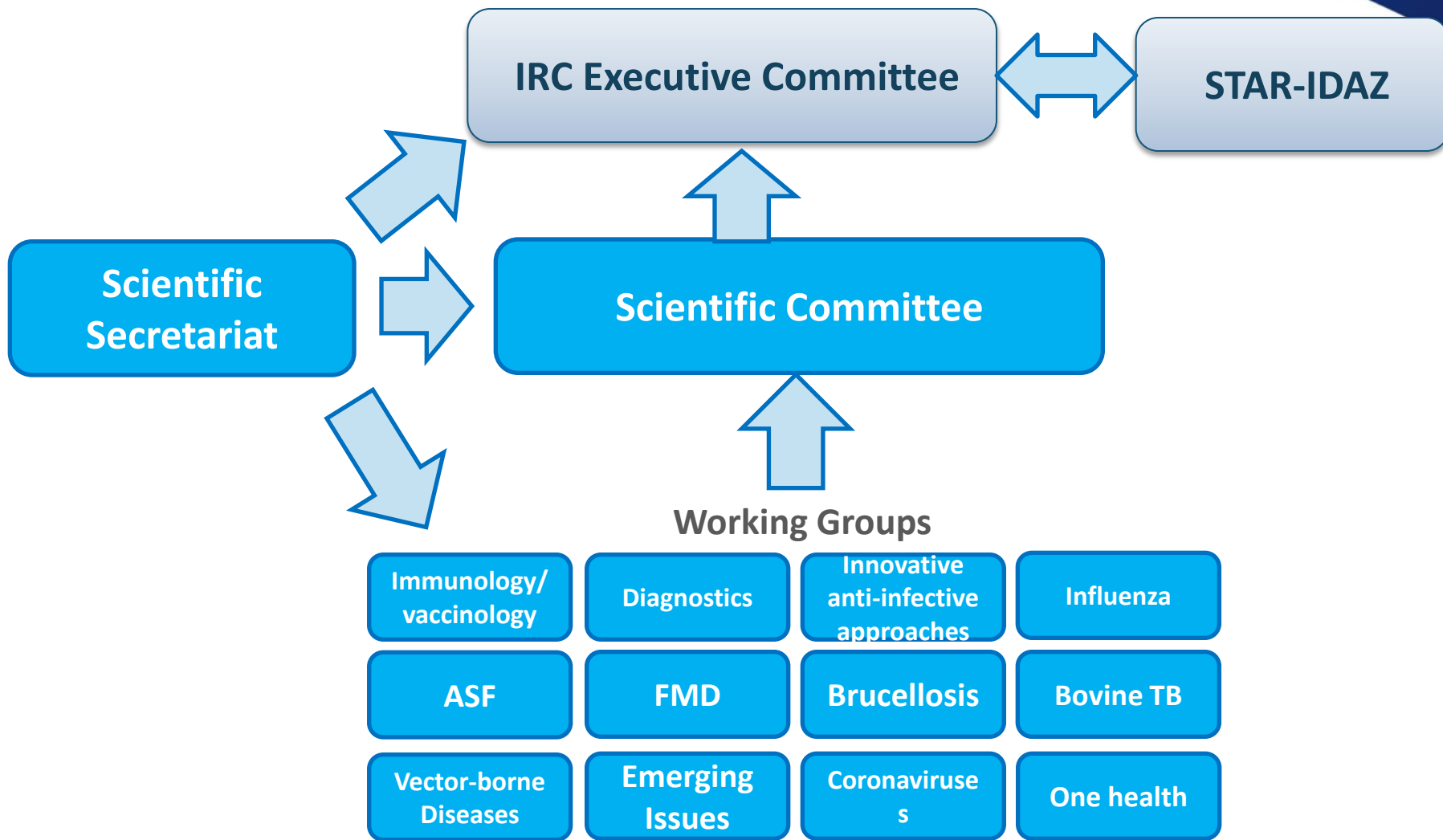
Moving to another level...



IRDiRC Model



Governance Structure



Programme-Owner Commitment

- A minimum level of investment in research on the agreed priorities over a five year period
- Agreed delivery targets
- Agree to coordinate/align funding to deliver these targets
- Agree to share research results

Delivery Targets

IRDiRC – “200 new therapies for rare diseases and means to diagnose most rare diseases”!!

IHEC – to decipher at least 1000 epigenomes within the next 7 – 10 years!

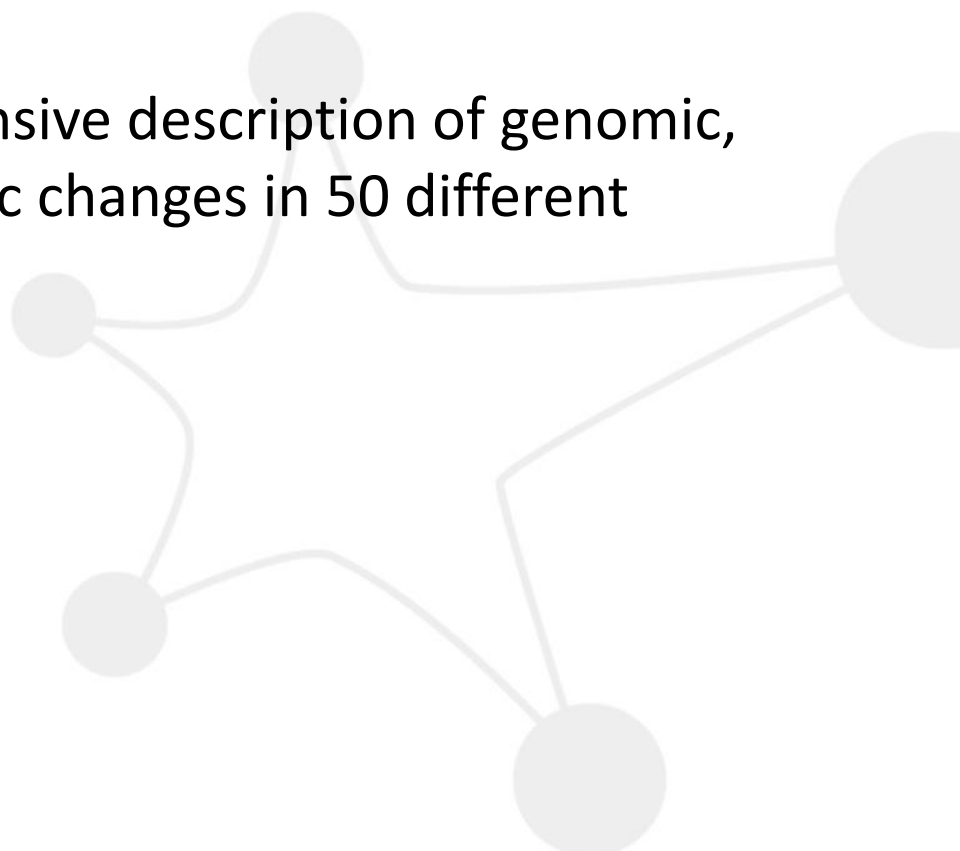
ICGC – “To obtain a comprehensive description of genomic, transcriptomic and epigenomic changes in 50 different tumor types and/or subtypes”

STAR-IDAZ - ?

Vaccines,

Diagnostics,

Critical Scientific information



STAR-IDAZ IRC deliverables

The overall objective of STAR-IDAZ IRC is 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 and other animal health products, and/or**
- **procedures**
- **key scientific information/tools to support risk analysis and disease control .**

Mandate of the Working Groups

- Map and report on major ongoing national, regional or international initiatives in its field of interest to maximize worldwide awareness of these projects.
- Point out the problems and difficulties in the scope of the WG that ultimately prevent or delay the development of new diagnostics, vaccines/therapies and/or key information/tools for risk analysis and disease control strategies (gap analysis)
- Recommend prioritised research objectives, actions or solutions to resolve gaps, problems and difficulties in the scope of the WG
- Cooperate to ensure synergies of all research projects within the scientific area of the working group, by exchanging results, expertise, experiences and information

Mandate of the Working Groups

- Agree on good research practice to be adopted (e.g. standard operational procedures, performance indicators) for animal health research
- Promote scientific excellence and enabling environment, including human resource development and capacity building
- Liaise with other working groups as appropriate
- Adopt and report back on the implementation of STAR-IDAZ IRC policies and guidelines in animal health research projects and propose changes where necessary
- Report to the Scientific Committee at least twice a year
- Working groups may organise, in collaboration with the IRC secretariat, scientific conferences in their domain

STAR-IDAZ IRC Secretariat

- Organizing meetings of the STAR-IDAZ IRC Executive Committee, Scientific Committee and working groups
- Maintaining the STAR-IDAZ website and databases and keeping all members updated
- Assisting the Scientific Committee and Working Groups in organising research gap analysis meetings and running periodic foresight exercises
- Conducting, upon request, the preparation of any document necessary to the STAR-IDAZ IRC committees and working groups, such as assisting bibliographic searches or literature reviews

STAR-IDAZ IRC Secretariat

- Collecting and diffusing pertinent information and results to the researchers funded by STAR-IDAZ IRC members
- Disseminating results of STAR-IDAZ IRC projects with different means of communication: website, newsletters, communication materials, conferences.



Thank You For Your Attention

<http://www.star-idaz.net/>



