Coordinating animal health research globally to accelerate delivery of disease control tools and strategies

Efficient, effective and focussed research to reduce the impact of animal disease on animals, livestock sector, environment, public health and food security

Overview
The STAR-IDAZ International Research Consortium (IRC) of research funders and programme owners, aims to maximise the impact of animal disease research funding through coordination and cooperation.

Objectives
The overall objective of the STAR-IDAZ IRC is to coordinate research at the international level to contribute to new and improved animal health strategies for at least 30 priority diseases/infections/issues.

Deliverables
The deliverables include; candidate vaccines; diagnostics; therapeutics and other animal health products; procedures; and key scientific information/tools to support risk analysis and disease control.

The Secretariat supports the STAR-IDAZ IRC Executive Committee, Scientific Committee and Working Groups.

SIRCAH (secretariat)

Scientific Committee
The Scientific Committee brings expertise and representation from academia, livestock and animal health industry, and risk assessment/regulatory bodies.

- Identifies need for and missions of Working Groups and assesses their progress
- Supports gap analysis and research prioritisation with strategic direction
- Proposes research priorities, policies and guidelines
- Coordinates the scientific merit of proposals
- Acts as a scientific coordinating body and exchange for best practice
- Makes funding recommendations to the Executive Committee

Working Groups
The working groups comprise relevant science experts including representatives from funded projects, livestock industries and other stakeholders. Composition is geographically balanced.

- Map and report national, regional or international initiatives
- Point out the challenges to overcome (gap analysis)
- Recommend research objectives or solutions to resolve gaps
- Grace synergies across research projects
- Agree good research practice
- Promote scientific excellence and enabling environment
- Listen with other Working Groups
- Advise STAR-IDAZ IRC policies and guidelines
- Report to the Scientific Committee

Research Community
The research community comprises all those people and organisations who can contribute towards tackling the overall problem.

- Research scientists
- Farms and industry experts
- Capability specialists

Animal Disease Control System Solution Engine
The Animal Disease Control SSE provides a common platform for the the STAR-IDAZ community to collaborate and deliver its strategic objectives by supporting more efficient, effective and focussed research that can deliver real impact to society.

Research Roadmaps

Funded projects help overcome a particular challenge, through a number of maturity levels until a solution is reached. A key part of a project is identifying the areas of knowledge and capability that can help accelerate it and sharing the primary and secondary impacts for the benefit of the community. It’s important that a portfolio approach is taken in choosing which projects to fund balancing opportunity, resources and risk.

Deliverables

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

The IRC Executive Committee comprises one representative per Partner Organisation, the Chair of the Scientific Committee and the STAR-IDAZ Chairperson.

- Agree Governance, Policies and Guidelines, including decision on the Working Groups
- Coordinates research funding strategies
- Promotes support from the livestock and animal health industries and from donors

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Animal Disease Control System Solution Maps

**Actors**
Set of participants involved in the system
- **Government**
  - Society / consumers
  - Regulators / government
  - Transporters, receivers and processors
  - Academia
  - Health professionals
  - Private companies / industry
  - National, international and international health organisations
  - Non-governmental organisations
  - Other agencies

- **Society / consumers**
  - Behavior of the actors in the system
  - Meat products are provided

- **Regulators / government**
  - Human factors
  - Collaboration & creative ways of working
  - Infection
  - Human factors
  - Collaboration & creative ways of working

- **Transporters, receivers and processors**
  - Sensing & measurement
  - In-silico modelling of systems from micro to macro scales

- **Academia**
  - In-silico modelling of systems from micro to macro scales

- **Health professionals**
  - Data analysis
  - Testing, trialing and evaluating

- **Private companies / industry**
  - Policies, problems & standards
  - Regulatory approval and commercial licensing

- **National, international and international health organisations**
  - Research into understanding human behaviour and
    science and technology expertise that is brought to

- **Non-governmental organisations**
  - Sensing & measurement
  - In-silico modelling of systems from micro to macro scales

- **Other agencies**
  - Testing, trialing and evaluating

**Capabilities**
Growing body of knowledge, assets and resources brought to bear on the solution
- **Growing body of knowledge, assets and resources brought to bear on the solution**
- **In-silico modelling of systems from micro to macro scales**
- **Sensing & measurement**
  - Generating systems and approaches for gathering data
- **Data analysis**
  - Interpreting, understanding and building meaning from data
- **Testing, trialing and evaluating**
  - Business and platform to evaluate solutions from labs to field
- **Failure & root cause analysis**
  - Systematically understanding failures and their causes
- **Economic & impact modelling**
  - Understanding the full impacts of possible changes in the system
- **Policies, problems & standards**
  - Setting systems and approaches for gathering data
- **Regulatory approval and commercial licensing**
  - Creating and evaluating potential vaccine candidates and
    strategies
- **Public and private organisations involved in vaccine discovery**
  - Public and private organisations involved in vaccine discovery
- **Research into understanding human behaviour and
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**Actions**
Activities throughout the end to end pipeline
- **Activities throughout the end to end pipeline**
- **In-silico modelling of systems from micro to macro scales**
- **Sensing & measurement**
  - Generating systems and approaches for gathering data
- **Data analysis**
  - Interpreting, understanding and building meaning from data
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**Diagnostics**
Detection and classification of abnormal events or unusual patterns of activity in the animal or population
- **Detection and classification of abnormal events or unusual patterns of activity in the animal or population**
- **Sensing & measurement**
  - Generating systems and approaches for gathering data
- **Data analysis**
  - Interpreting, understanding and building meaning from data
- **Testing, trialing and evaluating**
  - Business and platform to evaluate solutions from labs to field
- **Failure & root cause analysis**
  - Systematically understanding failures and their causes
- **Economic & impact modelling**
  - Understanding the full impacts of possible changes in the system
- **Policies, problems & standards**
  - Setting systems and approaches for gathering data
- **Regulatory approval and commercial licensing**
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    strategies
- **Public and private organisations involved in vaccine discovery**
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    science and technology expertise that is brought to

**Intervention**
Treatment of disease or intervention to prevent disease from spreading
- **Treatment of disease or intervention to prevent disease from spreading**
- **Sensing & measurement**
  - Generating systems and approaches for gathering data
- **Data analysis**
  - Interpreting, understanding and building meaning from data
- **Testing, trialing and evaluating**
  - Business and platform to evaluate solutions from labs to field
- **Failure & root cause analysis**
  - Systematically understanding failures and their causes
- **Economic & impact modelling**
  - Understanding the full impacts of possible changes in the system
- **Policies, problems & standards**
  - Setting systems and approaches for gathering data
- **Regulatory approval and commercial licensing**
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**Control**
Management of an outbreak or disturbance once it has been identified
- **Management of an outbreak or disturbance once it has been identified**
- **Sensing & measurement**
  - Generating systems and approaches for gathering data
- **Data analysis**
  - Interpreting, understanding and building meaning from data
- **Testing, trialing and evaluating**
  - Business and platform to evaluate solutions from labs to field
- **Failure & root cause analysis**
  - Systematically understanding failures and their causes
- **Economic & impact modelling**
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**Animals**
The individual animal that becomes diseased as a result of the pathogen
- The individual animal that becomes diseased as a result of the pathogen
- **Society / consumers**
  - Behavior of the actors in the system
  - Meat products are provided

**Pathogens**
The microorganisms or viruses that cause disease in animals and populations
- **Microorganisms or viruses that cause disease in animals and populations**
- **Society / consumers**
  - Behavior of the actors in the system
  - Meat products are provided

**Pathogenic Animal**
The population of animals that live with the diseased animal
- The population of animals that live with the diseased animal
- **Society / consumers**
  - Behavior of the actors in the system
  - Meat products are provided

**Production environment**
The context and habitat in which the population of animals live
- The context and habitat in which the population of animals live
- **Society / consumers**
  - Behavior of the actors in the system
  - Meat products are provided

**Ecosystems / environments**
The place in which the pathogen is primarily found
- The place in which the pathogen is primarily found
- **Society / consumers**
  - Behavior of the actors in the system
  - Meat products are provided

**Biome**
The habitat and other similar organisms in which the pathogen occurs
- The habitat and other similar organisms in which the pathogen occurs
- **Society / consumers**
  - Behavior of the actors in the system
  - Meat products are provided
Animal disease control research roadmaps

Generic roadmaps that can be applied to different diseases

**Vaccine development**
- Vaccine
  - Identity of protective antigens
  - Expression System
  - Adjuvant
  - Delivery Route
  - Delivery Platform
  - Virulence in Challenge Model

**Diagnostic test development**
- Organism isolation (primary step)
- Genome detection
- Antigen detection
- Host response
- Sample collection
- Stage specific antigen
- Gene expression
- Gene detection
- Direct detection / identification

**Diagnostic test**
- Pathogen genome
  - Molecular Typing
  - Vector
  - Environment
- Warning signal
- Prevalence of disease
- Host Range
- Contact network
- Coinfection

**Therapeutics development**
- Vaccine
  - Safety
  - Delivery Route
  - Delivery Platform
  - Virulence in Challenge Model
- Inactivated Vaccines
- DNA/RNA vaccines
- Subunit vaccines
- Vectored vaccines

**Therapeutics**
- Mode of action
- Pharmacology
  - Drug design
  - Kinetics
- Combination of drugs
- Delivery routes

**Epidemiology and development of disease control strategies**
- Pathogen genome
  - Molecular Typing
  - Vector
  - Environment
- Host Range
- Contact network
- Coinfection

**Lead**
- Research Question
- Solution Routes
- State of the Art
- Dependencies
- Projects
- Challenges

**SSE Roadmaps**
- These generic disease control roadmaps can be applied to different diseases to help identify disease specific research gaps, leads and projects to focus on problems that matter. Each roadmap has a target lead, and explores the dependent leads that need to be solved.