



STAR-IDAZ
International Research
Consortium on Animal Health

Executive summary of priority research needs

Influenza

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Research Priorities for influenza

STAR-IDAZ IRC has developed roadmaps on influenza(<https://roadmaps-public.star-idaz.net/#/home>) to highlight areas where research effort needs to be focused in order to speed up the delivery of improved control methods for animal influenza outbreaks for the benefit of both human and animal health. In the development of research roadmaps for 1) epidemiology and disease control strategies, 2) diagnostic tests development, and 3) candidate vaccines development, working groups of international experts identified the research gaps in Table 1 as priorities.

Table 1: Main research priorities identified for influenza

Topics	Research priorities
Vaccine development	<ul style="list-style-type: none"> • Develop DIVA vaccines • Design antigens that are more broadly cross-reactive with antigen variants at least within the virus clades or more preferably within the subtype • Study physical characteristics, stability, safety and immunogenicity for adjuvants • Design vaccine for multiple antigens expression by a single vector • Better understanding of maternal antibody needed to improve vaccination strategies • A better understanding and definition of correlates of protection among different target species, improving also bioinformatics tools • Need acceptance/definition of correlates of protection from CHALLENGE models on different targeted species • Challenge models on different targeted species that can be tested outside BSL-3/4 Research/Select Agent facilities to screen vaccine candidates • Study new viral vectors or beneficial bacteria as vectors • Comparison and impacts of mucosal vs systemic vaccines
Influenza control strategies	<ul style="list-style-type: none"> • Improved cost-effective biosecurity - new tools, optimized and assessed approaches, including smallholder education programmes • Role of environmental, ecological and human variables in virus transmission patterns • Multistakeholder co-creation of solutions and control strategies • Modelling aimed at identifying risk regions, optimizing surveillance and prevention measures and decision making for best prevention and control strategies & measures • Design vaccination strategies that fit species, age, production type as well as in varied stages of an outbreak • Study cross-species infectivity, including wild bird populations, that could prevent spill over of HPAI • Rapid and safe depopulation methods, particularly for poultry, including carcass disposal • Study socio-economic aspects, particularly stakeholder acceptance • Viral, host, and environmental factors that influence the risk of virus evolution and adaptation to new species (e.g. acquiring an HA multibasic cleavage site) • Identify molecular markers that favour interspecies transmission from wild bird reservoirs to other hosts (poultry, swine)

Diagnostic development tools	<ul style="list-style-type: none"> • Validation of rapid, accurate and cost-effective in-field diagnostic tests for targets populations (e.g. pen-side tests) • Inexpensive and readily available DIVA tests associated with surveillance protocols • Improvement of RRT-PCR and NGS, robotics or other approaches which favour local testing and centralized tools to support bio-informatic analysis and visualization/sharing of data (depending also on training of bioinformatics) • Reliable tests for environmental sampling • Sample transport media that stabilise virus without refrigeration • Finding and maintaining public-private partnerships for (rapid, accurate, cost-effective) diagnostics, mutually beneficial for the partners involved
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STAR-IDAZ IRC and animal influenza

STAR-IDAZ International Research Consortium (IRC) is a global initiative to address the coordination of research programmes at an international level in the area of animal health and in particular infectious animal diseases including zoonoses (STAR-IDAZ – Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses) – for details see <http://www.star-idaz.net/>.

Research on influenza is a high priority topic for the STAR-IDAZ IRC, where we wish to speed up the delivery of improved control methods for animal influenza outbreaks. Influenza outbreaks are currently having a major impact at global level, causing major economic losses in the poultry sector of affected countries. Moreover, influenza viruses, are being reported in a growing number of mammals and, being sporadically zoonotic, could have the potential to escalate causing a human influenza pandemic.

A full report is available at: <https://www.star-idaz.net/app/uploads/2022/05/Animal-Influenza-Research-Review-25-April-2022.pdf>

Research on animal influenza

In 2021, STAR-IDAZ IRC, in collaboration with USDA-ARS, commissioned an [influenza research review](#) report to provide a general overview of research that has been conducted across the major fields of animal influenza in the previous six years. By incorporating research updates and input from leading scientists in the field, the influenza research review report represents a picture of animal influenza research around the world, enriched by the first-hand knowledge of those working at its cutting edge.

The findings of the report fed into a gap analysis workshop held on the 14-15th of June 2022 at the National Animal Disease Centre in Ames, Iowa. Expert opinions and the review of recent and current research and control measures, alongside knowledge of on-the-ground countermeasures (both in use and under development) and their efficacy, were used in identifying the critical knowledge gaps.

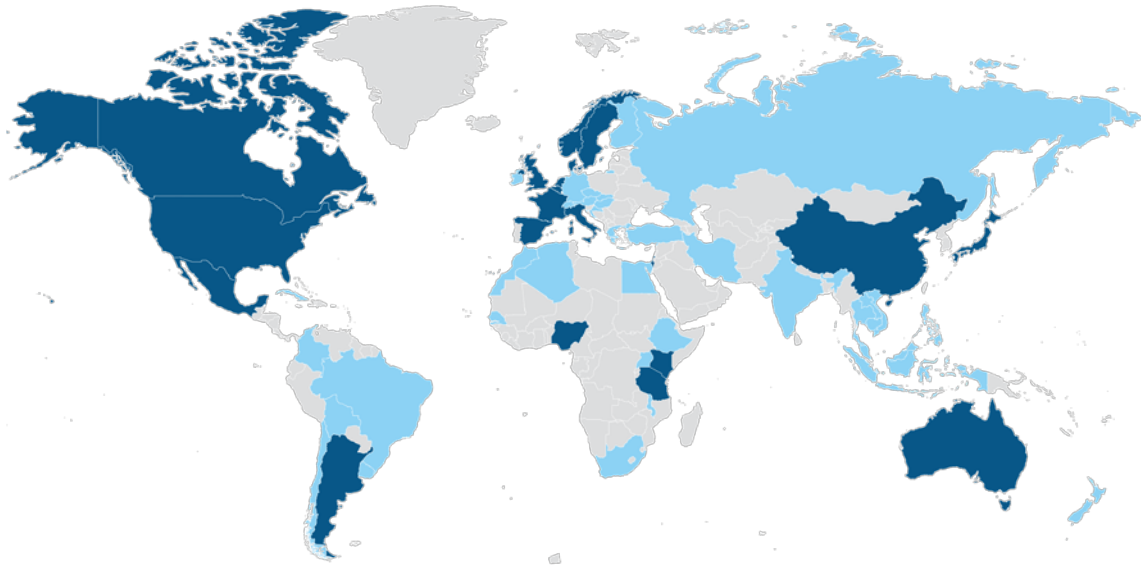
Based on previous gap analysis, the key objectives of the three workshops, held online the 30th and 31st of January and 1st of February 2023, were to develop research roadmaps for control strategies, diagnostics and vaccine development for influenza. The research roadmaps which highlight the steps that need to be taken to focus the research efforts where it is most needed to improve efficiency in response to future outbreaks, can be found in detail at this link (<https://roadmaps-public.star-idaz.net/#/home>).

During each workshop the research priorities within the main topics discussed were identified by experts utilising an on-line tool for voting. In Table 1 above, the main research priorities identified are summarised.

Conclusion

STAR-IDAZ IRC, as suggested by the animal influenza WG, recommend research funding targeted at the research priorities listed above to speed up the delivery of improved control methods for animal influenza outbreaks.

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



30 Partner organisations

20 Countries

55 Associated countries

\$2.5b Research investment

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Are you a animal health research funder/programme owner wishing to join the STAR-IDAZ International Research Consortium?

Please contact v.mariano@woah.org for more information