

Global Call for Research Proposals: Innovations to improve livestock vaccines

- This document is a Call for Research Proposals for funding support from the International Development Research Centre (IDRC).
- The purpose of this call is to support the use of the latest cutting edge innovations to improve existing vaccines against livestock diseases.

Deadline: March 21, 2017 at 12:00pm EDT (Ottawa)

Click [here](#) to submit an application

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1. About the International Development Research Centre

The International Development Research Centre (IDRC), a Canadian Crown corporation, funds research in developing countries to create lasting change on a large scale. We achieve this by providing developing-country researchers with financial resources, advice, and training to help them find solutions to local problems; by encouraging knowledge sharing with policymakers, researchers, and communities around the world; by fostering new talent by offering fellowships and awards; and striving to get new knowledge into the hands of those who can use it.

2. About the Livestock Vaccine Innovation Fund

The Livestock Vaccine Innovation Fund (LVIF) is an initiative developed by the Bill & Melinda Gates Foundation, Global Affairs Canada, and Canada's International Development Research Centre. It represents a joint investment of CA\$ 57 million over five years to support the development, production, and commercialization of innovative vaccines against livestock (including poultry) diseases in sub-Saharan Africa, South and South East Asia. The LVIF will work through partnerships to develop vaccines that are affordable, available, and acceptable to livestock smallholders, and to facilitate their use at scale. The Fund targets key livestock diseases that have the most impact on both women and men livestock smallholders.

3. About the Call

3.1 The Challenge and Opportunities

Vaccines are the most cost-effective means available for managing infectious diseases in animals. However, vaccines that are available for prevention or control of diseases with the greatest impact on poor livestock smallholders are often not designed with the developing country smallholder context in mind. These vaccines often confer short-lived immunity resulting in multiple re-vaccinations, display poor efficacy or safety profiles, have limited capacity to protect against multiple serotypes and are mostly administered using parenteral injection requiring skilled vaccinators. The majority of current livestock vaccines were developed several decades ago and consist of either live vaccines with uncharacterized attenuation or crude preparations of killed pathogens with low immunogenicity. In addition, the conventional parenteral administration route of these vaccines results in suboptimal induction of immune responses resulting in equally suboptimal immunity and/or immunological memory.

Despite major advances in biotechnology and vaccinology which now provide an unparalleled opportunity for the development of new or improved livestock vaccines, very few vaccines that address the outlined challenges have been introduced over the past 20 years. In fact most improvements have either been marginal or when significant, have failed to respond to the realities of the needs of livestock smallholders in low and middle income countries (LMICs) or have consisted of costly production methods that could not attract manufacturers who target these relatively low resource markets.

Recent biotechnological advances such as the genomics revolution and greater computational capacity to analyse large nucleic acid data sets and deduce through systems approaches potential immunological pathways and their interaction with pathogenic factors provide exciting opportunities to improve attributes of existing vaccines. For instance, rapid characterization of virulence genes provides greater prospects to achieve targeted attenuations that strike the desired balance between safety and immunogenicity. Similarly, advances in the immunological understanding of modulation of desired immune responses by targeting relevant immune cells or tissues provide unique opportunities to improve current vaccines. Finally, cutting edge progress in vaccine research indicates that development of vaccines with greater serotype coverage are now within our reach.

Strong partnerships between livestock vaccine researchers, vaccine manufacturers and early involvement of regulatory authorities in Africa and South and Southeast Asia will be important when working towards accelerating the registration of improved livestock vaccines for smallholders.

3.2 Research to be supported by this Call

Research supported by this call will comprise of novel ideas or pre-existing innovations to respond to the challenges of existing livestock vaccines in Sub-Saharan Africa and South and Southeast Asia. Proposed research will be expected to focus on generating vaccines with better product profiles and must demonstrate high potential for adoption by vaccine manufacturers and livestock smallholders.

This call seeks proposals that are adopting innovative approaches to increase the duration of immunity by better induction and maintenance of immunological memory, reduce the number primo-vaccinations and/or revaccinations, improve vaccine safety and develop universal vaccines with capacity to provide protection against multiple strains, subtypes or serotypes. Examples of research eligible for this call include *in silico* prediction of virulent or immunogenic genes and subsequent application of these to develop safe, stable but highly effective vaccines, targeted delivery of vaccines by use of novel adjuvants or cytokines to generate the desired immune response, formulation of vaccines with appropriate carriers to generate effective mucosal immunity or eliminate parenteral administration. In addition, rapid platforms to predict and generate vaccines that can protect against multiple serotypes will be considered. Where applicable, innovations from other medical or veterinary fields could be harnessed to provide new mechanisms to deliver vaccines to maintain circulating antibodies against specific pathogens during windows of susceptibility or eliminate the need for revaccination.

The results of these projects will be the discovery of new adjuvants/vaccine delivery systems and novel vaccine design/formulations that present significant improvements over current vaccines and which can be transferred to vaccine manufacturers for subsequent registration of commercial vaccines for the livestock diseases listed in Appendix 1.

Research teams will need to present a compelling justification for the proposed innovative approach. Specifically, teams should describe why previous work targeting the proposed improvement have not been successful and explain why they believe the proposed innovation

will be successful. In addition, it is essential for research teams to demonstrate strong capacity to generate timely results based on specific milestones and within the allocated budget.

It is important to emphasize that approaches mentioned above are only meant to be *illustrative*, and not a comprehensive list of appropriate approaches, or exclusive of others.

This Call will **not** fund projects:

- related to registration issues;
- related to commercialisation;
- designed for fundamental research only.

4. LVIF Budget Contribution and Duration

We intend to provide grant funding for up to 6 research projects of up to a maximum of CA\$ 1,000,000 each for up to 30 months.

Proposals must include an overall plan of activities for a maximum of 30 months.

Contribution in the form of co-funding and mobilization of third party resources (public or private sector, other donor or stakeholder funding, etc.) to support and expand the research is encouraged.

5. Eligibility

- The proposed research must focus on vaccine improvement for one or more of the eligible livestock diseases of the LVIF as specified in Annex 1.
- Applicants from academia, private and public sector organisations with a strong research focus are eligible for this global call.
- Applicants from the United Nations system cannot apply to this Call as lead or co-applicants. UN organizations may participate as collaborating organizations.
- Applicants from CGIAR Centres are not eligible as lead applicant but are eligible as co-applicants or collaborating organizations.
- The lead applicant and co-applicants may negotiate and develop funding arrangements directly with third-party organizations for specific services. IDRC will not contract directly with third-party organizations. Applications that involve third-party organizations must clearly justify their involvement and explain their role(s). The total third-party participation in a project is set at a maximum of 30% of the budget.
- A person cannot be the lead applicant for more than one project. At most, person can apply as the lead applicant for one project and be a co-applicant for two additional projects.

For more information about eligibility please refer to the Frequently Asked Questions.

6. Research Ethics

- It is the policy of IDRC that research work involving human participants or animals be carried out in accordance with high ethical standards.
- Prior to commencing research, applicants will need to obtain approval from an official institutional or national research ethics body and will need to comply with the terms and conditions of the Grant agreement.
- Any research involving animals will need to obtain explicit approval from an appropriate body for oversight of the use of animals in research. All research will need to comply with local regulations and the terms and conditions of the Grant Agreement.
- Any research involving the use of genetically modified organisms must demonstrate adherence to all applicable international standards and procedures and meet local regulations and the terms and conditions of the Grant Agreement.

7. Cross-cutting Considerations

Applications must describe how the cross-cutting considerations presented below will be integrated into the design and implementation of the proposed research. While it may not be possible to address all considerations at the same level of depth, these will be taken into account in the selection process.

- **Gender equality:** One of the aims of the LVIF is to increase the participation of women scientists in livestock vaccine research. Proposals need to demonstrate how the project will involve women from all participating organizations comprising the research team and throughout the research process; a strategy that explains how this will be achieved needs to be included. Research teams should also incorporate in their proposal, vaccine attributes and features that respond to the unique challenges of women livestock smallholders.
- **Environment:** Proposals need to demonstrate that they have considered the potential environmental impacts of their activities, detailing potential benefits and describing how any harmful effects will be mitigated. See Annex 2 for more information.

8. Intellectual Property

- Research projects must demonstrate the Freedom to Operate in order to avoid the commercial use of a technology that is suspected to infringe on existing intellectual property rights.
- Applications must explicitly address intellectual property rights and must detail any potential issues identified (e.g. patents emerging from the research).
- There may be intellectual property rights considerations that flow from a patentable invention generated during the course of a project funded by the LVIF. The intellectual

property guidelines followed by the LVIF recognize rights to patentable inventions and copyright. IDRC reserves the right to discuss intellectual property issues with accepted proposals or to request clarification pertaining to intellectual property issues from applicants.

9. Submission and Review Process

9.1 Timeline

IDRC invites eligible applicants to submit an electronic application through IDRC's grant application submission system to this Call for Research Proposals before the deadline: **March 21, 2017 at 12:00pm Eastern Daylight Time (Ottawa)**. Acknowledgements of receipt will be sent to all applicants whose application was received before the closing date and time. Successful and non-successful applicants will receive notification of results by **August 31st, 2017**.

9.2 Selection Process

An external Expert Review Panel will evaluate and rank research proposals received according to the review criteria outlined below and will provide this information to the Governance Steering Committee of the LVIF. The Governance Steering Committee will use this information to make recommendations for funding decisions.

Proposals will be either accepted or rejected. Accepted proposals may receive specific comments from the reviewers, including budgetary adjustments, which applicants will be required to satisfactorily address before receiving any grant. Applicants with accepted proposals will be required to sign a Grant Agreement with IDRC that details the terms and conditions for the grant.

10. Review Criteria

Proposals will be assessed against the following review criteria:

Review criteria	Percentage of score (%)
<p>Innovative approach The proposal:</p> <ul style="list-style-type: none"> Provides a detailed justification of the selected innovative approach and clearly describes how this approach will result in a transformational improvement of a current vaccine of relevance to livestock smallholders in sub-Saharan Africa, South and South East Asia (25%) Demonstrates well-defined objectives and clearly described methodology. (10%) 	40

<ul style="list-style-type: none"> Addresses all ethical issues in relation to the use of animals and genetically modified organisms. (5%) 	
<p>Feasibility</p> <p>The proposal:</p> <ul style="list-style-type: none"> Describes how the proposed results will be achieved within the 30-month funding period and the allocated budget. (10%) Provides clear and achievable milestones within the 30-month funding period. (5%) Describes a clear plan of engagement with potential manufacturers and regulatory authorities to ensure support for the innovation into a commercial product. (10%) Clearly includes and describes effective partnerships with organizations in sub-Saharan Africa, South or South East Asia. (10%) 	35
<p>Expertise and composition of research team</p> <p>The research team demonstrates strong expertise in vaccine research, cutting edge biotechnology and has a proven record in livestock vaccine research and development. (15%)</p>	15
<p>Cross-cutting considerations</p> <p>Gender equality and Environment (please refer to Cross-cutting Considerations section). (10%)</p>	10

11. How to Apply

All applications must be submitted through an online application system by March 21, 2017 at 12:00pm ET. **Proposals received after the submission deadline WILL NOT be considered.**

Please visit [link to be added] to access the online application system and all the documents related to this Call.

Applications can be submitted in either English or French.

11.1 Additional Documentation for Application

1. Application form (note: applications must be submitted online)
2. [Guidelines for acceptable project expenditures](#)
3. Frequently Asked Questions

12. Enquiries

Any enquiries related to the Call and application process should be sent by e-mail to LVIF@idrc.ca.

All enquiries should be received on or before 17:00 ETD on March 3, 2017 in order to receive a response prior to the deadline date.

Any enquiries which affect all applicants received on or before the above-mentioned deadline will be added to the FAQs with the Fund's responses to those inquiries, without revealing the source of the inquiries.

13. Additional Important Considerations

1. As a Canadian Crown corporation, IDRC is subject to Canada's *Access to Information Act*. Consequently, any submissions in response to this Call for Research Proposals will be held by IDRC in a manner consistent with the *Access to Information Act*, including IDRC's obligations to disclose documents requested by members of the public.
2. Although there is no limit on the number of co-applicants in one application, IDRC will only negotiate Grant Agreements with the organization of the lead applicant and the organizations of up to two co-applicants (i.e. up to three Grant Agreements per research project).
3. By way of submitting an application under this call, the applicants consent to the disclosure of the documents submitted by the applicant to the reviewers within IDRC, Global Affairs Canada, the Bill & Melinda Gates Foundation and externally who are involved in the assessment and selection processes of proposals. If selected for funding, the applicants further consent to the disclosure of their name and the title of the proposed project in any announcement of selected projects. Unsuccessful proposals will be destroyed within 180 days after the close of the application period.
4. Applicants must be committed to publishing research findings in the public domain in accordance with IDRC's Open Access Policy.
5. IDRC reserves the right to reject proposals based on the geographical location of the applicant's organization or based on relevant policy or legislative considerations.
6. After an institutional assessment of an applicant's organization is performed, IDRC reserves the right to require the applicant's organization to partner with another institution as a condition of receiving the grant.

Annex 1**Eligible list of diseases for the Livestock Vaccine Innovation Fund**

Anthrax
Avian influenza
Bovine anaplasmosis
Bovine babesiosis
Bovine tuberculosis
Classical swine fever
Contagious Bovine Pleuropneumonia
Contagious Caprine Pleuropneumonia
East Coast fever
Echinococcosis
Foot and Mouth disease
Heartwater
Haemorrhagic septicemia
Lumpy Skin disease
Newcastle disease
Peste des Petits Ruminants-PPR
Porcine cysticercosis
Rift Valley fever
Sheep and Goat pox

Annex 2

Environmental Safety Guidelines of the Livestock Vaccine Innovation Fund

The research, development and manufacturing of veterinary vaccines is the subject of several national and international legislations and standards. The basic criteria that must be met are those of safety, efficacy, quality, purity and potency. Environmental safety is one of the aspects that must be considered at all stages, and must be demonstrated within the vaccine research and development process. The World Organisation for Animal Health (OIE) is the reference for laboratory methods and requirements for the production and control of vaccines and other biological veterinary products. Overall, Good Manufacturing Practices, Good Laboratory Practices and Good Clinical Practices should be applied throughout all stages of veterinary vaccine research, development and manufacture.

For the LVIF Global call for Research for Innovations in Livestock vaccines, the projects that will be funded should at the very least comply with their national or relevant international legislations related to veterinary vaccine research and development. In addition, research teams must comply with the Terms and Conditions of the Grant Agreement, including those related to environmental safety guidelines.

Potential risks related to research conducted under this call include contamination, pollution, virus shedding, infection of non-target species, recombination with naturally occurring virus relatives, reversion to virulence and integration of genetically modified virus DNA into host cell chromosomes. All research teams must identify potential environmental risks and indicate how each will be mitigated through the use of proper infrastructure and adequate processes. Research teams are required to conduct self-assessment and classify their proposed research into one of the following categories:

- X – Very High Environmental Risk: Projects with high probability of medium or high environmental impact that would be hardly manageable.
- A - High Environmental Risk: Projects with low or moderate probability of high environmental impact or high probability of low or moderate environmental impact;
- B - Low or Moderate Environmental Risk: Projects with low or moderate probability of low to moderate environmental impact; and
- C - Negligible Environmental Risk: Projects with negligible probability of environmental impact

Please note that the IDRC reserves the right to subject the self-assessment to an independent environmental safety expert prior to project selection and funding. Depending on the classification category above, some proposed research projects may be asked to conduct a full environmental impact assessment of their proposed research.

Some useful links addressing Canadian and International Environmental Safety Standards are provided below.

1. World Organisation for animal health (OIE):
<http://www.oie.int/en/international-standard-setting/terrestrial-manual/access-online/>
2. CEAA, 2012:
<https://www.ceaa-acee.gc.ca/default.asp?lang=En&n=A4C57835-1>
3. World Health Organization (WHO)
http://www.who.int/biologicals/vaccines/good_manufacturing_practice/en/
4. OECD
<http://www.oecd.org/chemicalsafety/testing/goodlaboratorypracticeglp.htm>
5. European Commission
http://ec.europa.eu/health/documents/eudralex/vol-4/index_en.htm