Societal, Economic and Regulatory Implications of Pathogen Control
Request for Applications

1. Introduction and Background

Genome British Columbia (Genome BC) is a catalyst for the life sciences cluster on Canada's West Coast and manages a cumulative portfolio of over $1B in research projects and science and technology platforms. Working with governments, academia and industry across sectors such as forestry, fisheries, agriculture, environment, bioenergy, mining and human health, the goal of the organization is to generate social and economic benefits for British Columbia and Canada. Genome BC supports BC researchers through its own funding programs and also supports local applicants competing for national funding competitions, including those run by Genome Canada. Please visit www.genomebc.ca for more information.

Genome BC recognizes the need for genomics research to be integrated with social science and humanities research to identify and study the societal issues that emerge from genomics-based[1] innovations. This may include, for example, researching broader themes of societal importance such as genetic discrimination and public perspectives of genomics application by sector; developing effective practices and policies for uptake of genomic-based applications; identifying when uptake would not be appropriate; or examining cross-cutting themes of societal importance.

Currently, there are few dedicated funding opportunities for this type of research. As part of its 2015-2020 Strategic Plan, Genome BC aims to enhance the breadth and scope of social sciences and humanities and related areas of study (SSH+)[2] and to facilitate SSH+ led collaborative projects related to genomics. In April 2016, Genome BC conducted two roundtable discussions with members of the research community from the social sciences, humanities and related areas of study. The intent of these roundtable discussions was the following: (1) to attract new capacity to Genome BC in the SSH+ space and encourage participants to share information on Genome BC with their colleagues; (2) to develop, through discussion and debate, initial ideas for pilot projects suitable for GBC funding schemes; and (3) to identify barriers to application to Genome BC for SSH+ researchers. These round tables led to two rounds of the Societal Issues competition, launched in 2016 and 2017 respectively. The first Societal Issues

[1] Genomics is the science that aims to decipher and understand the entire genetic information of an organism (i.e. plants, animals, humans, viruses and microorganisms) encoded in DNA and corresponding complements such as RNA, proteins and metabolites. Broadly speaking, this definition includes related disciplines such as bioinformatics, metabolomics (the study of the metabolite pools of an organism), proteomics (the study of the full or partial set of proteins encoded by a genome) and related areas of research. Surrounding these biological systems, social sciences and humanities research is essential.

[2] The acronym SSH+ refers to the "social sciences, humanities and related areas of study". It encompasses all disciplines that use analytical, critical, speculative or empirical methods to investigate the human condition, human behaviour and society. The "+" includes disciplines such as environmental and information sciences that might not otherwise be identified under SSH. For the purposes of this Request for Applications (RFA), it will be used instead of the term "GE^{3}LS".

competition funded four projects related to the health sector, and the second funded five projects focused on the agriculture and/or natural resource sectors.

Genome Canada also recognizes that applied social sciences and humanities research is necessary if genome sciences are to be translated beyond the lab. In this context they use the term GE^{3}LS research (Genomics and its Environmental, Economic, Ethical, Legal and Social aspects)[3].

In recognition of the value of this research and interdisciplinary collaboration, large-scale Genome Canada competitions[4] require integrated GE^{3}LS research as part of each proposal. These competitions occur periodically (typically every 12-18 months) and each has a specific focus. For example, the 2018 competition focuses on the Agrifood sector[5]. These integrated GE^{3}LS projects are necessarily focused on specific questions regarding the uptake or implementation of the particular genomics research project in question.

It is also possible to submit a stand-alone or GE^{3}LS-led large scale project to these competitions if the proposed work aligns with the current theme and is of sufficient scale. For those ready and interested in developing larger-scale projects, please contact Genome BC for further information.

While Genome BC continues to support applicants to Genome Canada, the organization has recognized the need for funding to support smaller scale projects to build local capacity and dialogue in this space.

This RFA aims to integrate SSH+ research with genomics research associated with Intake 5 of the Sector Innovation Program (SIP5) which focuses on pathogen control in particular, pathogens that can have a significant impact on food safety and human health in British Columbia.

2. Objectives

The Societal, Economic and Regulatory Implications of Pathogen Control RFA (SERI) aims to support research on the following:

- Societal concerns and questions raised by applications of genomics research to control pathogens in the food chain
- Potential regulatory and economic ramifications created by the application of genomics research to the control pathogens in the food chain

Applications should contain original research that is needed to meaningfully address questions related to one or both of these topics.

3. Parameters

- Genome BC has committed an investment of $150,000 to this initiative;

[3] The acronym GE^{3}LS should be understood broadly as genomics-related research endeavors and related activities undertaken from the perspective of the social sciences and humanities. It is therefore not strictly limited to the disciplines listed here.
[4] Large-scale Applied Research Projects have a project budget of at least $2M and four years duration. A typical proposal is worth between $5M to $10M.
[5] Agrifood sector includes aquaculture

- Each project can request between $50,000 to $75,000 from Genome BC;
- Co-funding (matching funds) is not required for these projects; and
- Project terms must be between 12 and 18 months.

4. Eligibility

In order to be eligible for this program, projects must demonstrate the following:

- Be led by an academic researcher based at one of BC's universities or affiliated hospitals, colleges, the BC Institute of Technology, government facility or other BC-based research institution;
- Be led by a researcher in an SSH+[6] discipline;
- Focus on at least one of the projects funded through the Sector Innovation – Intake 5 on Pathogen Control (SIP5);
- Address one or both of the objectives of this RFA; and
- Meet the parameters for projects in this program (project term between 12 and 18 months, Genome BC request between $50,000-$75,000).

Examples of eligible research could include, but are not limited to, work related to the following topics:

- Regulation of new genomic technologies proposed to control pathogens
- Consumer and industry acceptance of new genomic technologies
- Economic analysis of changes to food value chain based on use of new genomic technologies
- Identification of methods of collaboration or governance between producers, regulators, and distributors based on new identification and control practices introduced by genomic technologies

5. Application Process

There is a two-stage application process for this program:

1. Intent to apply to indicate interest in applying to the competition; and,
2. Application providing details on the research plan with an accompanying budget.

Notification of intent to apply and applications must be submitted directly to Genome BC through the following email address: societalissues@genomebc.ca.

Intent to Apply

Researchers interested in applying to this competition must notify Genome BC by email to societalissues@genomebc.ca. Once the teams approved for funding through the Sector Innovation Program – Intake 5 (SIP5) have been notified of the results of that competition, researchers interested in applying to the Societal, Economic and Regulatory Implications for Pathogen Control RFA (SERI) will be informed of the results so that they can start developing their proposals. To view the SIP5 results before they are publicly announced, researchers will be required to sign a confidentiality agreement. Genome BC will arrange a networking event after the releases of the SIP5 results to coordinate discussions of between SIP5 project leader(s) and interested SSH+ researchers.

[6] See earlier explanation of "SSH+".

Application

Instructions for submitting applications are available in the *Societal, Economic and Regulatory Implications of Pathogen Control- Application Form*, which will be available on the Genome BC website (www.genomebc.ca) and must be used. Detailed explanations of each application section are included with the form. Applications must address the evaluation criteria described in Appendix 1 of this RFA.

To ensure alignment with the objectives, applications must include a letter of support from researcher(s) funded through the SIP5 competition indicating alignment of the project with the SIP5 research.

A companion Excel budget must also be provided for the project. The template will also be available on the Genome BC website (www.genomebc.ca). Financial guidelines are described in Appendix 2.

Review Panel

Each application will be sent for external written review by at least two reviewers with expertise relevant to the application. These reviews are considered as input to a Review Panel which will consist of three members of the SSH+ community external to Genome BC. The Review Panel evaluates and ranks the submitted applications. Final funding recommendations will then be made by Genome BC to Genome BC's Board of Directors for approval.

Following the full decision process, all applicants, whether recommended for funding or not, will be provided with a written evaluation of their application.

6. Timelines

Key dates are listed below. Unless communicated otherwise by Genome BC, submissions must be received by Genome BC by 5pm Pacific Time on the day of the deadline.

Date	Activity
December 2018	Launch of RFA
12 February 2019	Deadline for indicating intent to apply to the Societal, Economic and Regulatory Implications of Pathogen Control RFA (SERI)
Early April 2019	Potential applicants notified of the Sector Innovation Program Intake 5 - Pathogen Control (SIP5) projects approved for funding[7]
Early April 2019	Networking event for funded SIP5 Project Leaders and potential SERI applicants Research summaries of approved SIP5 projects shared
13 June 2019	Deadline for submitting applications to SERI

[7] Results of the Sector Innovation Program – Intake 5 (Pathogen Control) competition will be shared with potential applicants to this initiative before the results are officially announced. Applicants will need to sign a confidentiality agreement.

Early October	Applicants notified of results to their application
1 January 2020	Anticipated start date for successful SERI projects

ADMINISTRATION FOLLOWING NOTICE OF RESULTS

The plan for disbursement of approved funds will be determined based on the specific needs of the project. The first disbursement of funds will flow to projects once all conditions for the release of funds have been met as detailed in the Notice of Results.

Funded projects will be required to provide Genome BC with a research and financial report at the end of the project. *Genome BC reserves the right to hold back a portion of funding until the completion of the final report*.

GENOME BRITISH COLUMBIA CONTACT

Interested researchers are encouraged to contact Genome BC at societalissues@genomebc.ca at their earliest opportunity with any questions or for clarification of any aspects of this RFA. Further information is available on the Genome BC website (www.genomebc.ca).

APPENDIX 1. EVALUATION CRITERIA AND GUIDELINES

Evaluation Criteria

To ensure that Genome BC's Societal, Regulatory, and Economic Implications for Pathogen Control RFA goals are met, projects will be evaluated on each of the following major criteria, which are regarded as equally important:

- Relevance of research idea to objectives of the RFA;
- Quality of research plan and deliverables;
- Ability of the research team to deliver; and
- Management and financial criteria.

See the application form for a description of the requirements for each section. Reviewers will be asked to interpret the evaluation criteria at a level appropriate to the scale and type of project proposed.

Relevance of Research Idea to Objectives of the RFA

1. Applicants must demonstrate, using specific and clearly defined and quantifiable milestones and objectives, the proposed outcomes to be achieved through the project. Proposals must demonstrate:
    a. The outcomes from the proposed project (e.g. upon completion and beyond).
    b. How the project outcomes will address the Societal, Regulatory, and Economic Implications for Pathogen Control RFA Objectives.

Quality of the Research Plan and Deliverables

2. Proposals must demonstrate:
    a. That the proposed objectives, goals, milestones and critical path are feasible and that the available resources are adequate to complete the project on schedule. Milestones must provide objective, quantifiable measures of success and should be realistically attainable during the proposed timeframe.
    b. That the design, methods and analysis are adequately developed, well integrated, and appropriate to the aims of the project.
    c. Links to collaborators that are essential to the success of the project (e.g. "lab-based" genome scientists), if applicable.
    d. The quality and suitability of the research/technical environment in which the work will be done.
    e. A plan for handling the research data and resources (data protection, release and publication, resource sharing, etc.), if applicable.

Ability of the Research Team to Deliver

3. Applicants must demonstrate that the project leader, co-applicants, and other team members (as applicable) have the ability to accomplish the project objectives:
    a. Have demonstrated leadership and research excellence, not necessarily related to genomics, but in relevant methodologies/scholarship to the type of research being proposed. This could include a description of the training and/or track record of the applicant(s) for the proposed research or the importance and relevance of the past work of the applicant(s).

b. Have a serious commitment to the project in terms of dedicated time and the amount of resources applied to it.

Management and Financial Criteria

4. To demonstrate a sound project management plan appropriate to the size of the project, applicants should provide the following:
    a. A communication plan for dissemination of results, including the way research results will be made accessible, communicated and transferred to project participants, user partners, and the scientific community, without conflicting with data protection (e.g. IP) policies.
    b. The management and decision-making plan for the project, including:
        - A Gantt chart of activities, linked to the proposed budget, with milestones and go/no-go decision points clearly identified;
        - The methods for addressing key challenges, roadblocks, lack of consensus and scientific progress (e.g. adherence to milestones); and
        - The individual ultimately responsible for the decision-making.

5. To demonstrate a sound financial plan, applicants should provide the following: (also see Financial Guidelines in Appendix 2):

    a. A budget for the project using the template provided by Genome BC. The budget will be assessed on the basis of the following questions:
        i. Is the project financing plan reasonable and feasible?
        ii. Do the budgeted costs comply with the Financial Guidelines (Appendix 2)?
        iii. Are the budgeted costs aligned with the proposed research plan and activities?
        iv. Is there a clear relationship between the costs and proposed benefits of the project?
        v. Do the documentation and principal financial assumptions support the proposed budget?

APPENDIX 2. FINANCIAL GUIDELINES

Eligible Costs

Eligible costs are defined as reasonable, new and incremental costs for items that directly support the objectives of the Genome BC approved project. All Genome BC funds must be spent in British Columbia.

Eligible costs may include the following:

1. Salaries:
    - Salaries and benefits for graduate students, post docs, researchers, trainees, technicians. Note that salaries of researchers or senior management who are currently funded by their respective organizations are **not** considered eligible costs; and
    - Payments to persons based outside BC, for example investigators' salaries, are **not** considered eligible costs. However, external costs that are incurred based on a reasonable fee-for-service arrangement or contract are considered eligible.
2. Reasonable and limited operating costs (i.e. day-to-day expenses incurred in conducting the research) such as the cost of conducting surveys or consultations, administrative supplies (e.g. paper, photocopying) and other consumables.
3. Reasonable and low general and administrative (G&A) costs directly linked to undertaking the project. G&A costs must not exceed fifteen percent (15%) of the non-administrative costs of the project budget (calculated as total budget less administrative costs). Examples of G&A costs include:
    - Costs for the project's communications and public outreach activities, including costs associated with ensuring open access to the findings (e.g. costs of publishing in an open access journal or making a journal article open access);
    - Costs related to travel that is not directly related to the research activities (e.g. travel to conferences). Travel for research activities such as sample collection should be listed as consumables under the relevant project activity in the budget; and
    - Costs for attending or participating in conferences.
4. The costs related to services provided by fee-for-service providers.
5. Cost of equipment, computer hardware or software, information databases and communications linkages required to complete the project, up to a maximum of $5,000. Note that equipment under $2,000 is to be budgeted as a Consumable. The opportunity cost of using existing infrastructure **cannot** be included as an eligible cost.