



## **REQUEST FOR APPLICATIONS**

### **Biomarkers of Doping in Sport**

#### **1. Background**

Established in 1999, the World Anti-Doping Agency (WADA) is an international, independent agency composed and funded equally by the Sport Movement and Governments of the world. Its key activities include scientific research, education, development of anti-doping capacity, investigations, and monitoring compliance with the World Anti-Doping Code — the document harmonizing anti-doping policies across all sports and all countries. WADA's mission is to lead a collaborative worldwide movement for doping-free sport.

Les Fonds de recherche du Québec (FRQ) fall under the authority of the Chief Scientist of Quebec and consist of three funds (Nature and Technology, Health, and Society and Culture) that share a common mission to promote and financially support research, knowledge dissemination and researchers' training in Quebec, and to establish the necessary partnerships to fulfill this mission.

Science is an important driver of advances in the fight against doping. Innovative research leads to the identification of new doping trends, new substances, new doping methods and new detection approaches. The impact of this research can extend beyond WADA's main objective of protecting athletes. Knowledge generated by anti-doping research can be applicable to broader societal challenges. Addressing these broad challenges requires complementary expertise that has been developed by many Quebec researchers.

WADA funds [scientific research](#) projects to develop and optimize analytical tools for the detection of use of prohibited substances and doping methods within sport populations. These projects are analogous to biomedical research studies that aim to develop new tests for disease prevention, screening, diagnosis, and therapeutic monitoring of clinical populations.

The development of novel biomarkers of doping is a key priority for anti-doping research. The challenges for the development and implementation of new biomarkers for anti-doping testing not only involve specific analytical approaches and omics technologies, but also require complementary expertise and research approaches that have been advanced in Quebec for the development of clinical biomarkers.

In this context, WADA and the FRQ have joined together to launch a Request for Applications (RFA) that aims to develop biomarkers of doping.

This RFA is connected to the Memorandum of Understanding (MOU) that WADA and the FRQ announced on [16 May 2018](#), which would yield CAD 2 million to focus on advanced areas of anti-doping scientific research; and that, on [24 May 2018](#) resulted

in another joint RFA regarding the use of artificial intelligence in the fight against doping. That call led to the funding of [three projects](#).

As part of this second RFA, WADA and the FRQ aim to promote research on biomarkers of doping that integrates expertise in anti-doping science with Quebec expertise in areas such as biostatistics, bioinformatics, clinical pharmacology, development of diagnostic tests, and design/analysis of clinical trials.

## **2. Eligibility of research proposals**

Applications eligible for this RFA should aim to develop:

1. biomarkers of relevant prohibited substances or methods, or
2. biomarkers of known confounding factors encountered in anti-doping testing.

Priority will be given to biomarkers of substances/methods with higher prevalence of use. Priority will also be given to translational research proposals that aim to move biomarkers beyond the discovery stage and into anti-doping testing by WADA-accredited Laboratories within as short a timeframe as possible after the end of the project. Applicants must ultimately aim to demonstrate how the candidate biomarker can improve anti-doping outcomes.

Proposed projects should aim to attain concrete deliverables by the end of the funding period that have the potential to be subsequently translated into new analytical methods to detect the use of prohibited substances or methods. Applicants should specify minimum performance characteristics (e.g., sensitivity, specificity) for a biomarker-based test to have a reasonable chance of demonstrating utility when used to complement current anti-doping approaches. Projects that develop novel strategies for the analysis, detection and validation of doping biomarkers are also eligible for support from WADA and the FRQ through this program.

The types of studies that would be eligible include, but are not limited to, the following:

- Development of biomarkers to improve the detection of autologous blood transfusions, erythropoietic stimulating agents, synthetic forms of endogenous anabolic androgenic steroids, or synthetic forms of growth hormone, insulin-like growth factor 1 (IGF-1), insulin, myostatin inhibitors or their endogenous signalling modulators;
- Validation of candidate biomarkers or biomarker panels that have been previously reported;
- Application of new discovery tools to existing samples or datasets;
- Evaluation of the degree to which genetic and environmental factors influence biomarker levels and their potential impact on interpretation of laboratory test results;
- Development of biomarkers to mitigate the effects of confounding factors on current analytical methods;
- Development of screening methods to identify samples that are not consistent with other samples from the same athlete;

- Development of computational methods to enable implementation of biomarkers in routine anti-doping testing; and
- Later stages of translational research to evaluate the potential for implementation of promising biomarkers.

WADA and the FRQ would like to support projects that improve the use of existing datasets or samples from existing athlete cohorts. Proposals are encouraged to consider multiple sample matrices (e.g., urine, whole blood, plasma, serum, dried blood spots). Applicants are also encouraged to integrate sex- and gender-based considerations into their study design (i.e., samples disaggregated by sex, and sex-specific associations reported, where applicable).

Studies requiring human samples would be expected to have access to existing samples or have a feasible plan for generating such samples. Studies using non-human model systems are not eligible.

### **3. Applicants**

The research team must include at least one member based in Quebec.

Collaboration between research groups is encouraged, including integration of expertise in both anti-doping science and the development of biomarkers for clinical use.

All projects should also demonstrate engagement of [anti-doping laboratories](#) (e.g., WADA-accredited laboratories) or [anti-doping organizations](#) in the development of the research plan to help ensure practical applicability of the research. Teams are encouraged to include anti-doping laboratory scientists with expertise in methods for sample collection, test development, test validation, and ongoing test performance in compliance with the [International Standard for Laboratories](#).

### **4. Parameters**

There is approximately CAD 800,000 available for this competition. WADA and the FRQ will invest a maximum of CAD 400,000 in an individual project if costs are well justified. Successful projects will be awarded funding for a term of up to two years.

### **5. Application and decision process**

Scientists interested in submitting proposals for the above-noted topics are invited to submit their applications by **5 October 2020 (24:00 GMT)** via the [WADA Grants](#) platform.

It is recommended that applications be submitted in English, though French applications will also be accepted. All other relevant documents should be translated if the originals are in a language other than English or French. The following documents must be submitted via the platform:

1. A project description (maximum five pages) including objectives, methodology, experimental design, timelines, preliminary results and relevant bibliographic references;
2. Information about the researchers (Canadian researchers are encouraged to submit their Canadian Common CV), their home institution and the available resources, facilities and equipment; and
3. For research involving human subjects and/or human samples (including existing material), a copy of the local ethics committee approval, participant information letter and consent form.

If these documents are pending at the time of submission, they will be required once the grant is approved for funding.

Applicants are encouraged to contact WADA for assistance with composition of the research team and access to biological samples, as well as other technical aspects.

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Applicants may also contact the FRQ for assistance:

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The evaluation criteria will be as follows:

- Project quality (relevance, rigour, clarity, feasibility, originality);
- The research teams' competence and expertise; and
- The expected benefits for anti-doping outcomes.

Additional assets for project proposals include training and advancement of the next generation of researchers and preparation of a knowledge transfer strategy.

All of the projects submitted will be reviewed initially by independent external experts, and then by a panel of WADA representatives and external experts. The projects that are retained will be submitted to the WADA and the FRQ Executive Committees for approval.

**Applicants can expect to receive a reply by the end of May 2021.**

WADA and the FRQ thank all scientists who submit proposals that are aligned with the topics described above and that bring together expertise in anti-doping science with biomedical expertise in Quebec and beyond to foster research on biomarkers of doping.