



## Azrieli Science Grants Program Request for Applications

### The Neuro-Immune System and Brain Development

#### Application Manual

**Due date for Letter of Intent (LOI)**

**Friday May 14, 2021 18:00EDT**

**Due date for Full Applications**

**Friday July 9, 2021 18:00EDT**

## Background

Since its establishment in 1989, the [Azrieli Foundation](#) has funded institutions and programs in Canada and Israel in eight impact areas, including Science, Research and Healthcare. We support scientific research from bench to bedside and enable the training of scientists and clinicians. Our mission is to advance discoveries and novel approaches that address the core of challenging biomedical problems. To achieve this, we strive to initiate and sustain programs that chart new scientific territory and change paradigms. The Azrieli Foundation supports research in the neurosciences to drive discovery in molecular, cellular and physiological processes of normal and abnormal brain development and homeostasis that could lead to effective treatments, interventions and prevention of neurodevelopmental disorders (NDD).

## The Azrieli Science Grants Program

We are pleased to announce our **2021 Request for Applications (RFA): “The Neuro-Immune System and Brain Development”**.

The Azrieli Science Grants Program has three main **objectives**:

- 1) To enable scientific advances in basic and translational neuroscience, with particular focus on neural development and neurodevelopmental disorders
- 2) To bring new ideas and talent to the field of neurodevelopmental disorders
- 3) To catalyze collaborative networks of neuroscience researchers around specific research themes.

## Description of the Opportunity

In this RFA, we seek to support research projects that deepen our understanding of the cross-talk between immune and inflammatory regulators in embryonic and early postnatal development of the nervous system. The emphasis is on how these mechanisms contribute to normal nervous system development, physiological homeostasis and/or neural cell function, and/or how their dysfunction may contribute to neurodevelopmental disorders. In time this research will allow for the development of targeted therapeutic interventions for neurological disorders and mental illness where the immune system plays a significant role.

Researchers not currently working in neural systems who have an interest in moving into the field of neuroscience are also encouraged to apply, provided that preliminary feasibility studies have been documented. All applications will be evaluated on the applicability and potential impacts of their work to fundamental neurosciences and to neurodevelopmental disorders.

**For the purposes of this RFA, we define neurodevelopmental disorder as follows:** A condition affecting the nervous system that manifests in the prenatal and/or early postnatal developmental period(s). This includes developmental brain dysfunction, which is evident as neuropsychiatric problems, learning, language or non-verbal communication impairments and/or impaired motor function.

Our long-term vision is that discoveries made possible by this RFA could lead to the development of mechanism-based treatments that address the fundamental molecular features that underlie neurodevelopmental conditions.

Applications will be evaluated by an international peer-review committee who will score and rank applications and provide recommendations to the Azrieli Foundation.

### **Project and Topic Eligibility**

**Topics eligible for funding include (but are not limited to):**

- Effect of infection, immune/inflammatory pathways on embryonic/fetal brain development, and intersection of these pathways with neuroendocrine signalling
- Anatomic, cellular and mechanistic characterization of neuro-immune interface in brain developmental processes
- Role of immune/inflammatory pathways related to the gut-brain axis (including microbiome) on brain development
- Role of microglia in brain development (including their “non-immune roles” such as synaptic pruning, connectivity, oligodendrogenesis etc.)
- Studies of the mechanistic impact on brain of neuro-immune interactions as they relate to high confidence risk factors associated with NDDs in humans
- Computational approaches to analyze large unbiased datasets to identify convergent immune and neuro-regulatory pathways (molecular, cellular, synaptic, circuit) affected by variation associated with disease risk factors;
  - identification and experimental testing of causal linkage across these biological pathways
  - identification and experimental testing of potential therapeutic targets from such analysis

### **Additional information:**

- We encourage, when appropriate, the incorporation of the developmental trajectory of biological processes into experimental designs, to determine developmentally relevant periods of influence of the immune/inflammatory system on brain development.
- Applications using any relevant model/experimental system will be accepted, provided the focus is relevant to the nervous system.
- Proposals must be anchored in a hypothesis driven project, but some funding may be budgeted for development of tools and technologies that enable discovery and analysis in the above areas.

The following are **NOT** eligible for funding:

- Projects where development of a model of a disease is the sole purpose
- Research based on candidate risk genes or environmental risk factors that are not supported by well powered, statistically significant genome-wide association or epidemiological studies, respectively
- A **primary** focus on behavioral paradigms/measures, pharmacology or drug discovery

### Funding available

Projects will be funded to a maximum of **Cdn\$150,000** per year for a maximum of three years. **We expect to fund the top five applications.**

### Applicant eligibility

- Research funded by the Azrieli Foundation must be hosted at accredited Canadian universities or Research Institutions that have Canadian Registered Charity status
- Applications may be submitted by individual researchers or teams
- **Inter-institutional collaborative proposals are strongly encouraged**
- For a team application:
  - Each team must have a Nominated Principal Investigator who will be responsible for managing the collaboration and whose institution will distribute the funds to the co-Principal Investigator(s)
  - Co-Principal Investigators may be from the same or different institution(s), provided that each is an accredited Canadian University or Research Institution with Canadian Registered Charity status
  - Collaborators may be from any institution and jurisdiction, but will not receive funding
- Each applicant (Nominated Principal Investigator and co-Principal Investigators) must be an independent researcher, with mandate to direct their own research program and manage their own funding
- Early Career Investigators are encouraged to apply
- Applications may be submitted in French, but will be translated to English for review

### Eligible Expenses

- Salary support for trainees and research staff
- Consumable laboratory materials and reagents
- Purchase and care of laboratory animals
- Small laboratory equipment if essential to proposed research project (<\$10,000 total)

- Laboratory services or core facility fees such as for microscopy, sequencing
- Computer software
- Cost of open access publication
- Travel expenses for research dissemination and collaborative research related to the project up to \$5,000/year

### Ineligible Expenses

- Salary of applicants (Nominated Principal Investigator, co-Principal Investigators, Collaborators)
- Consulting fees for preparation of the application
- Research space renovations
- Indirect, overhead or administrative costs associated with managing the research project

Please note that this list is not exhaustive, and budgeted expenses will be reviewed by the Azrieli Foundation for the final decision on eligibility.

### Key Dates

Week of March 22, 2021: Launch date

Friday May 14, 2021: Due date for Letter of Intent

Friday July 9, 2021: Due date for Full Application

September/October 2021: Peer Review Committee Adjudication

November 2021: Award Notification

March 2022: Funding and Project start

### Application Process

The online application portal (Apply- by Survey Monkey) will be available on or before March 29, 2021 for Letter of Intent submission. The LOIs will be reviewed, and if eligible, we will provide access to the Full Application form on Apply by Friday May 28, 2021.

#### 1) Letter of intent (LOI) **Due date: Friday May 14, 2021; 6pm EDT**

- The LOI will be used to confirm application eligibility and to prepare peer review committee
- LOI content:
  - Project Title
  - Statement of Purpose describing what the project is expected to achieve (30 words or less)

- Project Summary including scientific goals, methods and experimental model system(s), significance and relevance to neurodevelopmental disorders (500 words or less)
- List of applicants (Nominated Principal Investigator, Co-Principal Investigators, Collaborators - refer to definitions at the end of this document), institutional affiliations and email contact for each applicant
- List of potential reviewers (also include suggestions from outside Canada)
- List of researchers who should not be reviewers due to conflict of interest
- **Note: A budget is not required at the LOI stage**

## 2) Full Application **Due date: Friday July 9, 2021; 6pm EDT**

Full application content:

- Project Title (from LOI, *modifications permitted*)
- Statement of Purpose of the project (up to 30 words from LOI, *modifications permitted*)
- Scientific Summary (up to 500 words, from LOI, *modifications permitted*)
- List of applicants (Nominated Principal Investigator, Co-Principal Investigator(s), Collaborators), institutional affiliations and contact information for each PI (from LOI, *modifications permitted, except for the Nominated Principal Investigator*) and their roles in the project
- List of Key Personnel (trainees and research staff) and their roles in the project
- Project Proposal (up to 5 pages): background, hypothesis, scientific aims, methodology, expected timelines, potential outcomes and significance
  - Font (12 point; black type; do not use narrow font sizes or type density; smaller font size in figures permitted)
  - Line spacing (single spaced; 1-inch margins)
  - Bibliography (no limit; list should indicate key publications by applicants that are relevant to the proposal; preprints permitted)
    - Include this in Project Proposal document after page 5
- Proposal Attachments (for 1 & 2 below please upload as single PDF file)
  1. Figures
    - No limit
    - Applicants are encouraged to use the Figures section to a) provide a graphical abstract of the project and/or b) outline the proposed experimental plan in a diagram
  2. Submitted manuscripts

- Published, in press, submitted or online preprint manuscripts directly relevant to the proposal (limit: 2 manuscripts)
- 3. Videos (if applicable; mp4 format)
- Additional sections (up to 250 words each):
  1. Training and Mentorship plan
    - How is training built into this project?
    - How will trainees benefit from this project?
  2. Data Management/Knowledge Translation plan
    - Who are the beneficiaries of the knowledge generated in this project?
    - How will you share the data?
  3. Impact on Neurodevelopmental Disorders
    - What is the potential for new knowledge and interventions for NDD?
  4. Impact of the global COVID-19 pandemic on the Applicant Team's Research (optional) Describe the effects of the pandemic on research operations, outputs and planning, as they relate to this application.
- Budget (maximum \$150,000/year for a maximum of 3 years) in spreadsheet form with the following sections (downloadable template will be provided; upload as a PDF, ideally fit to a single legible page)
  1. Research Personnel
  2. Consumables, Small Equipment & Computing
  3. Animals
  4. Services & Core Facility fees
  5. Travel (does not include travel to Azrieli Foundation symposium)
  6. Costs for open access publication
- Budget Description (approximately 1 page) justifying the research costs in relation to project aims
- Nominated PI and Co-PI Curriculum Vitae- please include these details
  1. Current position
  2. Education
  3. Employment history
  4. Funding: Grants, Fellowships and Awards (last 5 years)
  5. Prizes
  6. Publication List (last 5 years)
    - For unpublished manuscripts include only those that are posted on open-access pre-print servers, in press or submitted (please do not list manuscripts in preparation)
  7. Other contributions (last 5 years)- for example
    - Invited talks, conferences, workshops
    - Teaching

- Scientific or other community service
  - Public science communications
8. Names of past and current trainees, (last 5 years, include dates and degree level)
  9. Most Significant Contributions (scientific works, scientific community contribution, training and mentorship achievements); *this section is optional, up to 500 words*

**Note:** Do not submit letters of support from Collaborators. The role and contributions of listed collaborators must be clarified within the proposal.

Any extra materials submitted will be removed from the application.

The Azrieli Foundation reserves the right to reject incomplete applications.



## **Review Criteria (Full application)**

An international panel of peer researchers will score applications in the following categories (equal weight). Note that these criteria are identical to those provided to the reviewers.

### **1.) Impact and significance of the proposed work**

- How does the proposed work address important research questions and key gaps in knowledge?
- What is the potential for the proposed research to advance new knowledge and how will it contribute to or advance broader outcomes or neurodevelopmental disorders in the short or long term?
- What are the impact and significance of the proposed research in relation to Azrieli Foundation goals for the Science Grants program, as described above? (To be included in the research proposal, and in the narrative section “Impact to Neurodevelopmental Disorders”)

### **2.) Quality and originality of the proposal**

- Is the hypothesis novel? Is this project innovative?
- To what extent does the proposed research explore creative and potentially transformative concepts?
- To what extent are the methodology and experimental design appropriate to address the hypothesis?

### **3.) Scientific, Technical and Operational feasibility**

- Is the research plan well-reasoned, organized and based on clearly stated rationale?
- Does the research plan incorporate a mechanism to assess progress/success at critical junctures?
- Are the timelines for this research realistic?
- Does the research plan identify potential risks or pitfalls, and provide mitigating strategies?

### **4.) Research Environment and Team**

- Does the Training and Mentorship plan clearly describe a plan for mentorship and training of early career researchers and trainees? Is the plan likely to contribute to trainee development and capacity building?
- Does the composition of the research team reflect complementarity of expertise? Are the roles of team members clear and justified? Does the track record of the Nominated PI, (and Co-PIs if applicable) reflect the likelihood of delivering the proposed research?

- Are adequate resources available to the team (either at the host institution or through the co-PI(s) and/or Collaborator(s)) to accomplish the proposed research?

### **5.) Data Management/Knowledge Translation plan**

The Azrieli Foundation strongly encourages open and rapid dissemination of research results and data to accelerate discovery and innovation. Therefore, applicants are asked to include a clear plan for managing the data funded through the grant with the following elements:

- To what extent does the application take into account the complexity and type of data?
- Is the application considering the long-term value of the research results/data for further progress through data sharing and dissemination?
- Is this an open science initiative?
- Are there innovative aspects to researcher/stakeholder engagement and knowledge sharing?

### **Azrieli Foundation Funding Policies**

- Funds must be used for activities related to the project aims and as described in the application, with some flexibility, to be reviewed by the Azrieli Foundation.
- This RFA is not a “bridge funding” opportunity.
- Awarded researchers will be required to demonstrate their adherence to ethical standards of research practice, including animal care, informed consent, laboratory health and safety prior to release of funding.
- Nominated Principal Investigators are required to submit annual scientific and financial reports on behalf of all co-applicants.
- No-cost extensions and carry over of unused funds to the following year will be considered on a case-by-case basis, after written request directed to the Azrieli Foundation, accompanying the progress report.
- Awarded researchers are expected to participate in an annual symposium. Travel costs for this activity will be covered separately by the Azrieli Foundation (not from the grant).
- The Azrieli Foundation strongly encourages open and rapid dissemination of research results and data, methods and reagents to accelerate discovery and innovation.

## Definitions

**Nominated Principal Investigator (NPI):** an independent researcher (with mandate to direct own research and manage own funding) at an accredited Canadian university or research institute with Canadian Registered Charity status; if the application is a Team submission, the NPI is authorized to provide consent for the LOI and the full application on behalf of the team, and is responsible for managing the collaboration. The NPI's host institution will direct funds to the Co-Principal Investigator(s).

**Co-Principal Investigator:** an independent researcher (with mandate to direct own research and manage own funding) at an accredited Canadian university or research institute with Canadian Registered Charity status.

**Collaborator:** any researcher or individual who contributes to the proposed project, from any jurisdiction, but who will not receive funding.

**Early-career Researcher:** an independent researcher, who is within 5 years of their first independent research/academic position, taking into account time used for official leaves of absence (medical, parental, for example)

**Neurodevelopmental Disorder:** A condition affecting the nervous system that manifests in the prenatal and/or early postnatal developmental period(s). This includes developmental brain dysfunction, which is evident as neuropsychiatric problems, learning, language or non-verbal communication impairments and/or impaired motor function.