Government of Canada Gouvernement du Canada

Science, Technology and Innovation Priorities for the Canada Excellence Research Chairs Program and the Canada First Research Excellence Fund

CHALLENGE	☐ Healthy Canadians	☐ Innovative and Resilient Communities	☐ Sustainable Food Systems	☐ Clean and Resource-Rich Canada	☐ Technologically Advanced Canada
DESCRIPTION	Enhancing the health and wellness of Canadians across all life stages.	Building thriving communities that are inclusive, liveable, smart, and safe.	Maximizing Canada's agri-food potential to support economic growth and secure, equitable access to food.	Fighting climate change and protecting Canada's environment while harnessing the potential of our natural resources to support a resilient, sustainable economy, and high quality of life.	Advancing transformative and enabling technologies that will support a technologically advanced economy and society.
OBJECTIVES	• Promote physical and mental health and wellness, including addressing the social, economic, and environmental determinants of health • Prevent and treat disease whether chronic, rare, or infectious, including emerging public health threats and future pandemics • Support Canada's readiness for health emergencies • Strengthen health care and primary care	• Reduce economic and societal inequality, including through addressing systemic barriers to economic and social inclusion • Improve and strengthen public institutions and public trust • Support diverse forms of creativity to foster innovation	• Protect food sources through clean innovations in agri- and aqua-culture that enhance biosecurity, support biodiversity, and improve water and waste management • Enhance food quality, safety, stability, and shelf life • Develop and apply innovative technologies to improve agricultural processes and products and reduce carbon emissions	• Fight climate change through the advancement of knowledge and applications in climate science (mitigation) • Enhance resiliency to the adverse effects of climate change (adaptation) • Preserve and protect the natural environment, including water, air, and soil quality, and its biodiversity • Develop sustainable approaches to resource extraction and processing that maximize economic value and minimize adverse environmental impacts • Advance energy diversification and renewable and next-generation clean energy • Develop and accelerate the adoption of clean technologies across the economy and society • Integrate different knowledge systems, including traditional, community, and Western science • Accelerate progress in difficult-to-decarbonize sectors of the Canadian economy, such as aerospace	• Develop enabling and digital technologies and leverage disruption to support innovation • Transform manufacturing processes and practices to enhance productivity • Advance knowledge on public acceptance and adoption of new technologies • Accelerate transition to a more digitally enabled society
AREAS OF FOCUS	☐ **Aging population** (e.g., chronic conditions, dementia, healthcare systems) ☐ **Antimicrobial resistance** (e.g., OneHealth, microbiology, genetics) ☐ **Brain health** (e.g., Alzheimer's, dementia) ☐ **Indigenous health** ☐ **Mental health and wellness** ☐ **Precision medicine** (e.g., treatment, prevention, diagnostics, imaging and analytics) ☐ **Primary care** (e.g., delivery models, access, and outcome improvements) ☐ **Problematic substance abuse** ☐ **Public and population health** ☐ **Regenerative medicine** (e.g., stem cells, tissue engineering, cell therapy) ☐ **Vaccinology and therapeutics** (e.g., vaccine development, CAR-T cell research)	☐ **Data** (e.g., data privacy, security, collection, analysis, communication, ownership, use) ☐ **Governance and public institutions** (e.g., democracy, security, public trust, law) ☐ **Healthy communities** (e.g., social dimensions of aging; economic and social determinants of health) ☐ **Inclusive growth** (e.g., business-sector innovation, digital economy, marginalization / inclusion, research barriers) ☐ **Inclusive societies** (e.g., reconciliation, systemic barriers, cross-cultural understandings, social cohesion, transportation, housing) ☐ **Inequality** (e.g., social, economic, health) ☐ **Resilient infrastructure** ☐ **The North** ☐ **Technological solutions** to address community opportunities and challenges (e.g., Smart cities) ☐ **Technology and society** (e.g., impact and ethics of AI, bioscience, or surveillance; impact of technology on relationships and human systems, transportation)	☐ **Agri- and aqua-culture** (e.g., regenerative agriculture, genomics-enabled agriculture) ☐ **Agri- and irrigation technology** (e.g., smart / precision agriculture, plant biotechnology, nanobiotechnology) ☐ **Bioeconomy** ☐ **Climate change research** ☐ **Food sovereignty** (e.g., Northern and Indigenous communities) ☐ **Indigenous-led agriculture** (e.g., Indigenous plants, products, and knowledge) ☐ **Livestock health and sustainability** (e.g., livestock vaccine research) ☐ **Plant health** ☐ **Proteins and alternative food sources** ☐ **Safety and security of food supply chain** (e.g., blockchain technology)	☐ **Alternative energy technologies** (e.g., carbon dioxide conversion; industrial-scale hydrogen production; high-performing clean battery technology; small modular reactors; wind and solar power, geothermal and waste heat) ☐ **Circular economy** (e.g., waste treatment, management and value creation, greening manufacturing, sustainable food packing and new compostable materials to replace single use plastics) ☐ **Clean technologies** ☐ **Clean transportation** (e.g., electrification, green aviation, clean fuels and materials) ☐ **Climate change research** (e.g., mitigation; adaptation and resilience; climate monitoring, modeling and prediction; sensing technologies; human impacts; climate policy) ☐ **Conservation ecology** (e.g., biodiversity, OneHealth) ☐ **Energy** (e.g., sustainable oil and natural gas technologies and processes) ☐ **Forestry** (e.g., forest ecology, fire science, sustainable forest management) ☐ **Green chemistry** ☐ **Low carbon materials for the construction sector** ☐ **Modern mining** (e.g., sustainable mining technologies and processes) ☐ **Northern and Arctic** (e.g., polar science, Indigenous resilience and adaptation) ☐ **Reducing energy consumption for the transport of data** ☐ **Water** (e.g., oceans science and technologies, blue economy)	☐ **Artificial intelligence** (e.g., machine and deep learning; human emotions/language applications, including Indigenous languages; surveillance, computer vision) ☐ **Big data technologies and analytics** (e.g., Internet of Things, blockchain, predictive and cognitive analytics) ☐ **Biomanufacturing** ☐ **Cybersecurity** (e.g., confidential computing technology and processes) ☐ **Genomics and applied science** ☐ **Materials and processing technologies** (e.g., new and advanced materials; chemical manufacturing; metal, non-metal, composite material, and photonics manufacturing; nanotechnology) ☐ **Micro-electronics and semi-conductors design and manufacturing** ☐ **Next generation communication technology** (e.g., 5G, 6G) ☐ **Photonics** ☐ **Quantum technologies** (e.g., quantum computing, quantum sensing) ☐ **Smart and digital manufacturing** (e.g., robotics, embedded sensors, 3D printing) ☐ **Space economy**
CROSS-CUTTING DISCIPLINES AND APPLICATIONS	**Enabling technologies (e.g., AI, blockchain, genomics, quantum)**				

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Social sciences and humanities, including ethics