



Global Nexus (NexusHealth)

Coming together to transform health

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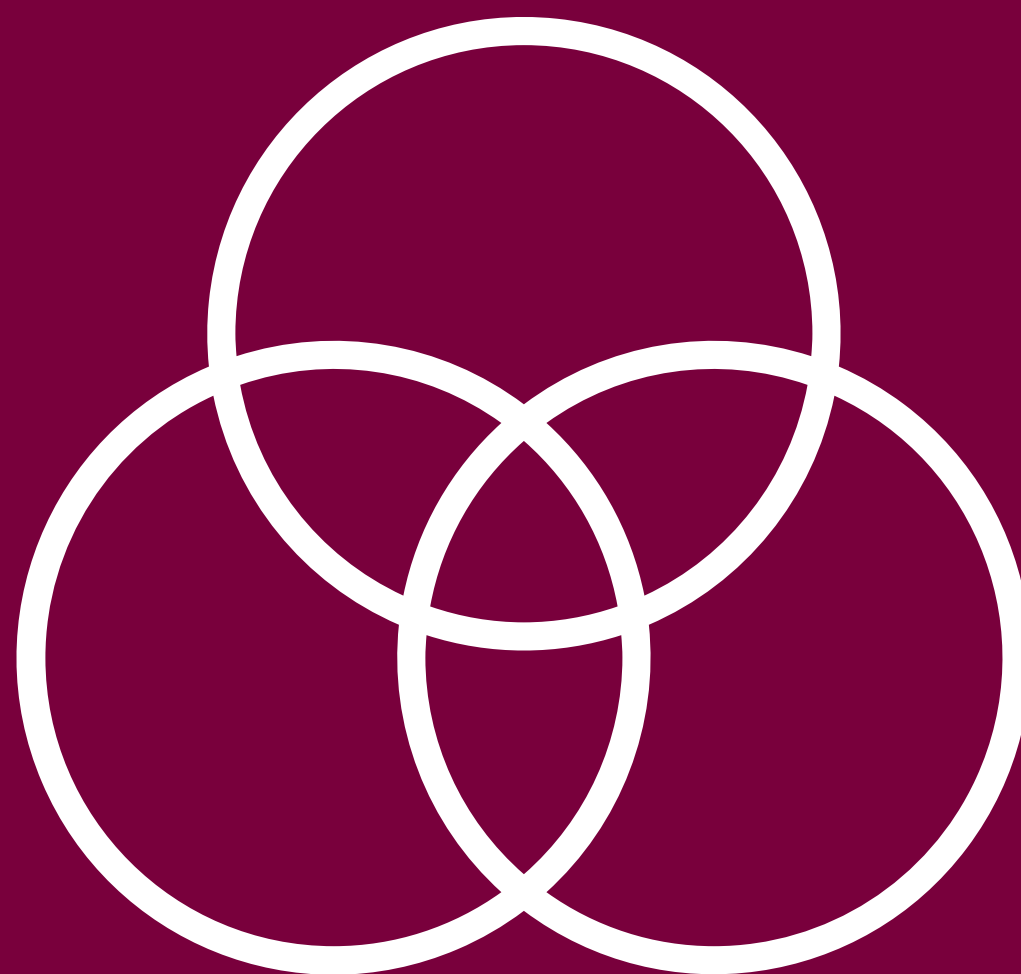
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McMaster University



About Global Nexus



Context: The Valley of Death



Global Nexus at a Glance

Global Nexus is a McMaster-based **health innovation accelerator**, designed to transform how the modern university catalyzes the translation of health-related discoveries to tangible new health solutions.

We're bringing together **stakeholders from across sectors** and working together in new ways to more efficiently move novel health solutions from the academy to society, where they can benefit the patients who need them.

Our **ethos of co-design** ensures stakeholders from different sectors have input at all stages of research, helping to shorten the pathway from ideation to implementation.





COVID-19 as a template

The speed at which COVID-19 diagnostics and vaccines were designed, approved, manufactured, and distributed was anomalous; however, it should be the norm. When traditionally disparate groups come together with a shared goal, new efficiencies and opportunities emerge. Global Nexus fosters these collaboration-borne efficiencies with its unparalleled access to:

- Researchers from an array of health and health-adjacent disciplines
- Partners from industry, government, public health, and diverse communities
- State-of-the-art animal/pre-clinical facilities
- Medicinal chemistry and synthetic biology platforms
- GMP-compliant biomanufacturing laboratories
- On-site clinical trials units
- Commercialization and translation resources
- Experts in uptake, access, and equity



Tackling Tomorrow's Health Issues Today

We're currently applying this template to the development of new **antimicrobial drugs (e.g., antibiotics), vaccines, diagnostics,** and novel **therapeutics** for infectious disease.

We are also working with promising compounds that could lead to all-new treatment options for **neurodegenerative diseases** and **cancer**. This suite of candidate health products positions us at the front line of several worsening health crises:

- **Antibiotic resistance** (est. 10 million deaths per year by 2050)
- **H5N1** — highly pathogenic avian influenza (next pandemic?)
- **Pandemics and outbreaks** (versatile vaccine platform)
- **Cancer and neuro conditions** (multiple candidate compounds)
- **Chronic conditions** (allergy, autoimmune, digestive, etc.)
- **Vector-borne diseases** (West Nile, Lyme, Dengue)
- **HQP in the workforce** (experiential training for the next-gen)
- **Future-proofing domestic infrastructure** (Canadian solutions)

Current Projects & Initiatives

We are developing a new bioinnovation centre that will allow us to scale our initiatives and impact exponentially; however, we're already making progress in these areas.

Using existing McMaster infrastructure, we are leading a range of important research initiatives in collaboration with key external partners.



AI-guided drug discovery



Aptamer-based therapeutics



Inhaled COVID-19 vaccines



Synthetic biology platform



Canadian Pandemic Preparedness Hub



Equitable and inclusive vaccine science

Equity & Access in Vaccine Science



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Kirkland, QC and Hamilton, ON, April 23, 2024 – During National Immunization Awareness Week, Pfizer Canada and McMaster University are proud to announce a significant project aimed at addressing critical gaps in health equity in the development and delivery of vaccines.

Pfizer Canada’s investment of \$500,000 to McMaster’s Global Nexus is aimed at supporting McMaster University's commitment to inclusive excellence in research by training emerging scholars from equity-deserving groups in the field of vaccinology, as well as students conducting vaccine research focused on populations who are especially vulnerable to infectious diseases.

Despite the effectiveness of vaccines in combating infectious diseases, systemic disparities in representation, efficacy, distribution, and uptake all persist. Recognizing these challenges, Pfizer is proud to support McMaster University's endeavour to support inclusive excellence in vaccine development and delivery.

"This grant from Pfizer Canada underscores our shared commitment to advancing health equity," stated Matthew Miller, Executive Director of Global Nexus at McMaster University. "Through Global Nexus, these talented young scientists are driving innovation and addressing research gaps to ensure vaccines protect all communities."

Changing the Paradigm





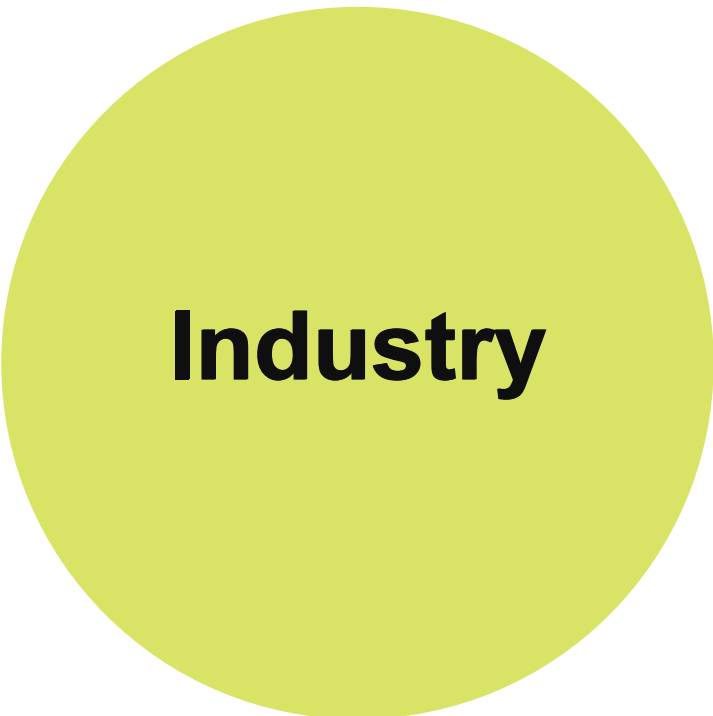
A Moral Failure

The lack of clinical trials activity and infrastructure in Canada is a moral failure that deprives patients of life-saving therapeutics, prophylactics, and technologies.

Global Nexus will change that.

Here's how.

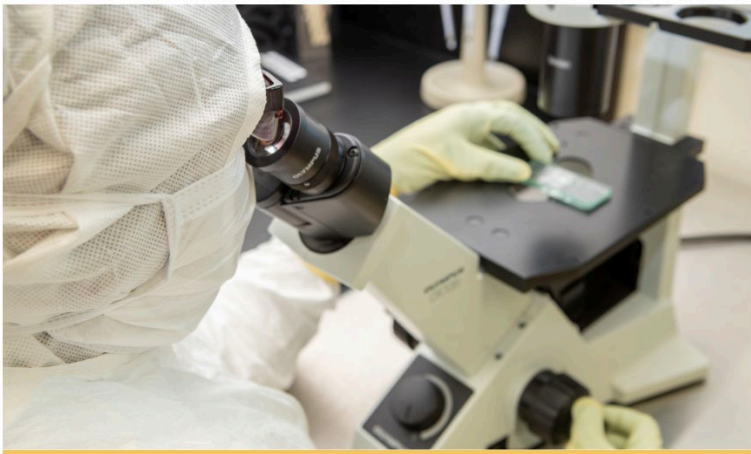
Working Across Sectors: Some of our Outside Partners



Leading a national drug and vaccine development network



McMaster and University of Ottawa receive more than \$115M to bolster pandemic preparedness in Canada



Strong Institutional Track-Record & Support

- McMaster has historically led **more industry-sponsored research** than any other Canadian university
- Global Nexus is the **foremost priority** of the Faculty of Health Sciences and the focal point of McMaster's upcoming fundraising campaign
- Global Nexus has strong **external validation**
 - Support from industry leaders, like Pfizer, GSK, and others
 - Co-lead of a national hub
 - Home of a national clinical trials network
 - Successfully recruited world-leading experts to join our team



Funding Timeline Brief

- April 2022: New CL3 Laboratory (BRIF stage 1): \$15M
- April 2023: Canadian Pandemic Preparedness Hub: \$2.5M (with UOttawa)
- April 2024: Biomanufacturing Lab (BRIF stage 2): \$31.7M
- April 2024: Pfizer Canada: \$710K
- October 2024: Centre for Collaborative Chemistry (FedDev): \$4M
- January: Biomanufacturing Lab (Province): \$17M

Global Nexus 3 year total: \$71M-\$73M



What's Next?





A new bioinnovation building at McMaster

- Development underway
- Linked to McMaster Hospital
- Collaborative Space

CL3 Lab

Our new containment level-3 (CL3) lab will allow Global Nexus researchers to conduct high-impact studies on dangerous, "Risk Group 3" pathogens, like SARS-CoV-2, Influenza A Viruses, Tuberculosis, and others. This lab will be equipped with an insectary for the study of vector-borne diseases, like Lyme.

GMP Biomanufacturing Lab

A new facility compliant with good manufacturing practices (GMP), which will enable safe, clean, and consistent production of an array of vaccines, medicines, and biologics.

AI/ML-Guided Drug Development Platform

A centralized facility with revolutionary drug discovery and development infrastructure. This centre will combine cutting-edge robotics integrated with AI/ML algorithms, while also facilitating manufacturing scale-up.

Central Animal Facility

A significant portion of McMaster's existing Central Animal Facility will be relocated to the Bioinnovation Building, where it will be expanded to facilitate a broad range of critical preclinical studies.

Radiopharmaceuticals

The building will also support GMP development of radiopharmaceuticals, built off of McMaster's world-leading reputation in the field

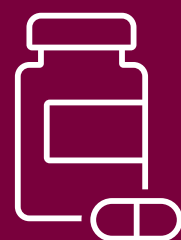
Clinical Trials Platform

Global Nexus is developing space at McMaster purpose-built to facilitate human trials for various health products.

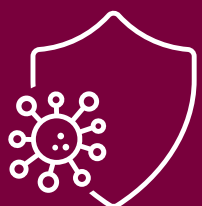
Impact-Focused Outcomes



More health products in clinical trials at any given time, ensuring a steady innovation pipeline



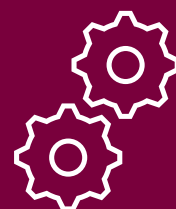
New antimicrobials to treat drug-resistant infections and mitigate the growing threat of AMR



Novel vaccines and medicines for infectious threats, like avian influenza and Lyme disease



New therapeutics for a range of chronic conditions, including cancer and neurodegeneration



Enhanced capacity to manufacture and test health innovations domestically, making them quickly accessible to patients in Canada



A pipeline of diverse scientists, clinicians, and health experts who will drive innovation into the future



Thank you!

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