NANOMEDICINES INNOVATION NETWORK
RÉSEAU D'INNOVATION NANOMÉDECINES

Letter from the Executive Director

May 2023

Preparing for future pandemics

NMIN involved in federally funded biomanufacturing hubs at UBC & UofT

On 2 March 2023, the Canadian government announced its initial Stage 1 investment of $10M in five biomanufacturing hubs across the country, made through the integrated Canada Biomedical Research Fund (CBRF) and Biosciences Research Infrastructure Fund (BRIF) competition.

These multidisciplinary hubs will accelerate the R&D of next-generation vaccines, therapeutics and diagnostics toward improving Canada's pandemic readiness, with nanomedicines an integral part.

NMIN researchers and legacy platforms will play a role in two of these hubs: *Canada's Immuno-Engineering and Biomanufacturing Hub*, led by The University of British Columbia (UBC), and the *Canadian Hub for Health Intelligence & Innovation in Infectious Diseases*, led by the University of Toronto (UofT).

As a Network legacy, NMIN's three Core Facilities will be integrated into these hubs, providing a strong innovation-facilitating foundation on which they can build, to ensure continuation of Canada's global leadership position in LNP gene therapy and drug delivery. This was a core commitment affirmed in the letters the Network provided in support of the hub applications.

Reflecting the Network's involvement, NMIN Scientific Director and CEO Dr. Gilbert Walker represented NMIN at the UofT hub announcement, while NMIN's eHTA Core leader Dr. Larry Lynd represented NMIN at the UBC event—where NMIN Founding Scientific Director Dr. Pieter Cullis played a hosting role.

"Contributing to the advancement of these hubs is a major component of NMIN's NCE legacy strategy," stated NMIN Executive Director Dr. Diana Royce, who is currently involved in the planning of next steps for the UBC-based hub.

"We're gratified to know that, in this way, our Network investments will continue generating globally competitive commercial innovation opportunities beyond NMIN's NCE lifetime, with social and economic benefits for Canadians and others worldwide."

MESSAGE FROM THE EXECUTIVE DIRECTOR

At the meeting of NMIN's Board of Directors on 29 March 2023, the Network's NCE liaison, Sara Esam, shared the NCE Program's annual "report card" for NMIN for the 2021-2022 fiscal year. For the third straight year, NMIN was found by the NCE Monitoring Committee to be definitively on track in fulfilling its strategic plan, its objectives, its EDI commitments, and meeting or exceeding all NCE Program expectations.

The NCE's evaluation is based on NMIN's extensive reporting on achievements and KPIs across the Program's five mandate areas, as compiled in its Annual NCE Progress Report and statistical reporting package.

I would like to reiterate the gratitude already conveyed by the Board Chair, Dr, Inès Holzbaur, to our NMIN staff for their role in this achievement, and to extend this thanks to all the Network's researcher leaders, investigators, HQP, partners and committee members. Running a successful network is truly a team effort!

The NMIN Administrative team is currently pulling together the content for NMIN's 2022-2023 NCE reporting, so I'd like to remind all our PIs how important it is to this process that you submit the reports requested of you on the progress and achievements of your NMIN-supported research. We will be excited to share with you our measurement of the Network's progress over the past year once we have all the data in hand.

Meanwhile, planning proceeds apace for NMIN's 2024 Research Conference, which will take place 24-27 January 2024 in Vancouver. Staff are adding details as they are confirmed to the event webpage on NMIN's website, where you can already find the preliminary program.

Confirmed keynote speakers for the event include: Sean Moffitt, co-founder of Futureproofing; Dominik Witzigmann, former NMIN HQP and current CEO of NMIN spin-off NanoVation Therapeutics; and NMIN's own Pieter Cullis and Shana Kelley.

As the culminating event of the Network, the 2024 Research Conference will be a showcase for cutting-edge science, a celebration of our accomplishments, and a launch pad for future progress in the field. Sponsorship opportunities are available, as detailed in the event prospectus, so please spread the word.

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eHTA team publishes in *Value in Health*

In late March 2023, the team behind NMIN's eHTA (early Heath Technology Assessment) Core Facility published "Frameworks for Health Technology Assessment at an Early Stage of Product Development: A Review and Roadmap to Guide Applications" in the journal *Value in Health*.

The NMIN-supported study reviews and summarizes existing eHTA frameworks, understood as systematic approaches to guide early evidence generation and decision making. Read the article.

Get in there!

Make sure you're included in NMIN's national database of nanomedicine-related R&D capacity in Canada.

As part of its legacy strategy, NMIN is creating an online database of Canadian nanomedicines researchers and the areas of expertise represented within their labs.

The database is intended to facilitate collaboration among nanomedicine researchers and labs—within and beyond the NMIN Network, now and in the future.

Please complete the NMIN survey with details about the research & development expertise within your lab, and NMIN will include this information in the database to facilitate collaborative research opportunities Canada-wide.

Complete the NMIN survey:
https://www.nanomedicines.ca/expertise-survey/

Speaking of future progress, to facilitate networking and collaboration among Canadian nanomedicine experts beyond the NCE lifespan of this Network, at the initiative of Associate Scientific Director Dr. Afsaneh Lavasanifar, NMIN is compiling information to populate an online database of nanomedicine expertise.

By capturing who has expertise in what, and which labs have what capacities and special instrumentation, this searchable database will enable efficient research match-making within the field across Canada.

Please help us build this additional NMIN legacy feature by taking approximately five minutes to enter information about your expertise and that of your lab into the online survey here.

Only nine months until we all gather for a last hurrah as a Network in beautiful BC. Here's to making the most of NMIN's final year as an NCE!

Dr. Diana Royce, Ed.D.
Executive Director, NMIN

RESEARCHER NEWS

NMIN Founding Director Dr. Pieter Cullis received a 2023 Killam Prize for enabling "fundamental advances in the development of nanomedicines employing LNP technology for cancer therapies, gene therapies and vaccines" & the 2023 Julia Levy Award from the Society of Chemical Industry (SCI).

READ MORE

NMIN Researcher Dr. Devika Chithrani's research into low-harm cancer treatment using gold nanoparticles was profiled in the *Victoria Times-Colonist*.

READ MORE

NMIN Researcher Dr. Shana Kelley is heading the new Chicago-based bioscience research lab funded with $250 million from Meta CEO Mark Zuckerberg & wife, as president of the *Chan Zuckerberg Chicago Biohub*.

READ MORE

NMIN Researcher Dr. Gang Zheng and colleagues have discovered a simple way to overcome cell membranes in order to deliver cancer therapeutics to tumor cells, using LNPs containing the reagent EDTA (ethylene-diaminetetraacetic acid).

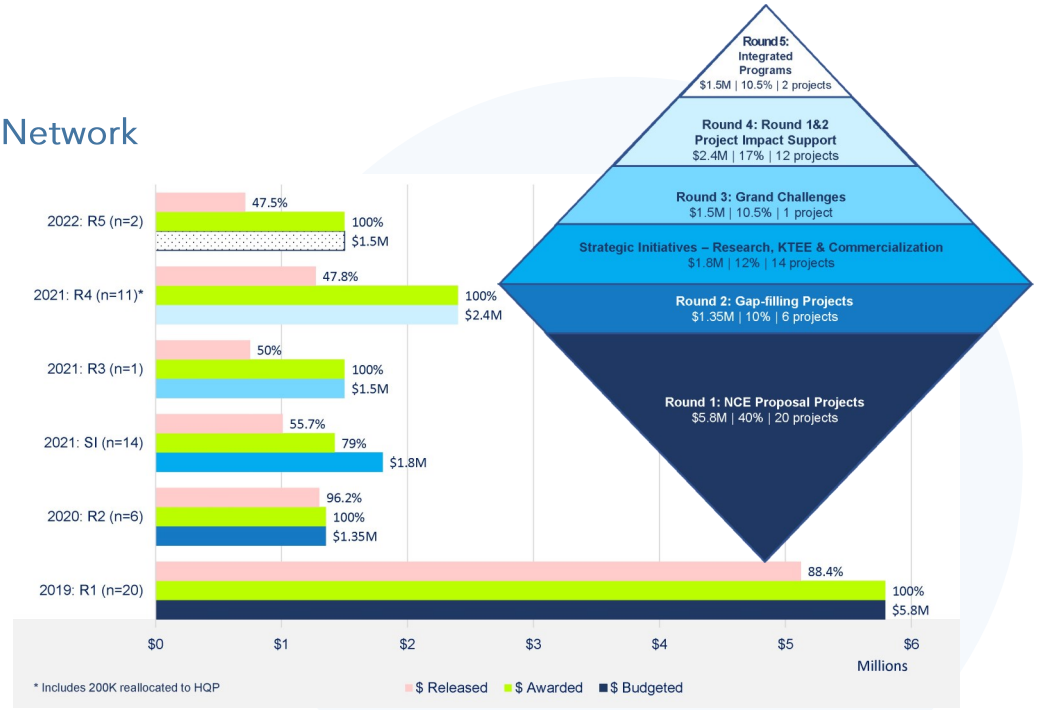
READ MORE

Research Updates

CHARTING A STEADY COURSE: Network research investment is on track

With the most recent research investments approved by NMIN's Board of Directors and Executive & Nominating Committee in March 2023, the Network has committed 97% ($13,930,085) of its research funding budget. As depicted in the graphic on the right, nearly 100% of this funding has been awarded, with between 47% and 96% (by round) already released.

In March, 11 projects were approved for Round 4: *Project Impact Support Program* funding. This signifies that ~40% of NMIN's 28 originally funded projects generated results with high commercial potential considered worthy of further development.



NMIN Research Project Funding
$14,345,085 budgeted / $13,930,085 (97%) awarded as of 31 March 2023

Additionally, three new *Commercialization Strategic Initiatives* were approved in March, further reflecting the overall shift in focus toward KTEE activities expected of networks at this stage.

In terms of project completion, 21 of 30 early-round NMIN projects have been completed, for a 70% completion rate that exceeds the benchmarked target by over 3%.

All of which adds up to the Network's being very much on track to fulfilling its strategic plan and maximizing its use of NCE research funding within its NCE lifespan.

IN OTHER NEWS: An improving climate for rare disease genetic therapies

Regulatory changes are on the way to accommodate the explosion of interest and activity focused on gene therapies and their potential use in the treatment of rare diseases—a result, in part, of the successful mRNA COVID vaccines.

The US Food and Drug Administration (FDA) announced two related initiatives on Rare Diseases Day 2023 in early March.

On the one hand, the agency announced it will be engaging ethicists to help the agency better frame issues around gene editing, as well as data generation using patients with rare diseases that have no cure.

Additionally, the FDA announced that it plans to soon launch a pilot program to expedite the approval of gene therapies for rare diseases.

These developments bode well for broader regulatory change in this promising area of endeavor, in which nanomedicines and NMIN researchers are closely involved.

"We really need to open the path to treating rare diseases, now that the tools are in our grasp," comments Dr. Terry Allen, Chair of NMIN's Research Management Committee. "These measures should certainly help."

Help NMIN's eHTA team to identify better ways to commercialize technologies in the life sciences.

Please take 10 mins to complete this NMIN-supported survey about commercializing technologies in the life sciences.

NMIN's Highly Qualified Personnel (HQP) Program

Finding a place in industry

NMIN HQP transition into industry employment

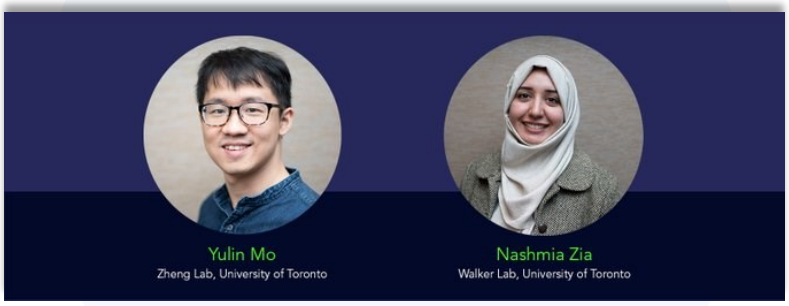
Congratulations to two NMIN HQP who recently assumed roles with a world-leading specialty chemicals company and with a top global management consulting firm, respectively.

Dr. Adele Khavari is Senior Project Manager at Evonik Industries.

Dr. Courtney van Ballegooie is a Consultant with Bain & Company.

HQP Research Presentations

The **13th round** of this series highlighting NMIN HQP's research took place on 30 March 2022, focusing on Light-Activated siRNA Endosomal Release (LASER) by porphyrin LNPs, and the use of nanomicelles for the timely diagnosis of liver fibrosis.



VIDEOS & POSTERS

For a searchable list of presentations featured in this series, with links to posters and video recordings, see the HQP Research Presentations Database on NMIN's website.

NMIN is pleased to congratulate **Dr. Nashmia Zia**—a Postdoctoral fellow at the University of Toronto (supervised by NMIN scientific Director & CEO Dr. Gilbert Walker) and NMIN's Theme 3 (Diagnostics) Research Accelerator—for winning the 2023 *PRiME-Unity Health Toronto Clinical Catalyst* award. Read more.

Meet the latest recipients of NMIN Advanced Training Certification (ATC)

L to R top: Miffy Cheng, Yulin Mo, Liza Silverman, Wesley Walker. *L to R, 2nd row:* Genc Basha, Karen Chan, Po-Han Chao, Cécile Darviot, Harrison Fan. *L to R, 3rd row:* Sarthak Garg, Isabelle Largillière, Tavonga Mandava, Samantha McWhirter, Tyler Thomson. *L to R, bottom row:* Ariadne Tuckmantel Bido, Michael Valic, Abishek Wadhwa, Logan Zettle, Nashmia Zia.

All received Silver-lever certification, except those in the top row who attained Gold-level certification in acknowledgment of their being highly engaged in a range of NMIN activities.

Welcome aboard!

Dr. Zeinab Hosseinidoust joined NMIN's HQP Advisory Committee in November 2022.

We are grateful for her input into planning NMIN's HQP training and programming opportunities!

Dr. Hosseinidoust is an Associate Professor of Chemical Engineering at McMaster University.

Recent NMIN Lectures

Jonathon Jafari imparts entrepreneurial know-how in two webinars

Jonathon Jafari, Lead Entrepreneur in Residence for the Human Health Venture Studio of entrepreneurship@UBC, delivered a series of two webinars for NMIN in February and March 2023.

He presented on the topics of: the entrepreneurial journey, by which one brings meaningful scientific discoveries to patients and partners; and Target Product Profiles (TPPs), living documents that leverage a multi-disciplinary approach to drive more robust product development. Recordings of both webinars are available on the NMIN website.