



21 December 2021

A message from NMIN's Scientific Director & CEO

With NMIN at the half-way point of its NCE mandate, I am pleased to report that we are on track in terms of fulfilling the Network's core aims in research, capacity building, networking and partnerships.

NMIN's Grand Challenges Program will soon enable a number of exciting new and highly networked research efforts, with expressions of interest submitted and reviewed by the RMC on December 15, 2021.

NMIN's fourth and final research funding call has also been launched, toward enabling the most promising projects funded in Rounds 1 and 2 to fulfill their commercial and social potential, representing NMIN's legacy research impacts.

In tandem with the Network's research progress, NMIN's HQP program has attracted a higher number of trainees than anticipated and leveraged online technologies to engage them in value-added capacity building and networking activities at impressive rates despite pandemic restrictions.

A measure of this engagement is evident in the fact that eight more trainees will soon be awarded NMIN's Advanced Training Certification (ATC) in recognition of their high degree of engagement in NMIN and its HQP activities. Congratulations to them for attaining this accreditation and for making the most of the opportunities this Network has been able to offer them!

I look forward to our collectively moving NMIN into its next stage of accomplishment and growth.

Thanks to each of you for being a part of this Network and Canada's vibrant community of nanomedicine scientists!

Dr. Christine Allen, PhD.
Scientific Director & CEO, NMIN

Grand Challenges & Round 4: NMIN's Research Program to 2024

NMIN's third call for research funding proposals is centred on a Grand Challenges Program, whose \$3M budget will support large, multidisciplinary project teams addressing significant basic and applied research questions.

Following the initial submission of 13 EOIs in September 2021, the *NMIN Grand Challenges Expressions of Interest (EOI) Integration Workshop* was held 21-23 October 2021 in Toronto for EOI applicants to discuss the integration of their EOIs into larger programs of research.

Invited, full applications will be reviewed by an external panel of scientific experts and by the RMC, whose recommendations will be considered by NMIN's Board of Directors for a final funding decision in early May 2022.

NMIN's fourth call for follow-on research funding proposals is being launched today, 21 December 2021, and aims to support the commercialization and/or clinical translation of completed Round 1 and Round 2 NMIN projects, where matching funds, an achievable two-year timeframe, and a clearly identified commercial or clinical endpoint are present.

Round 4 applications for up to \$200,000 will be accepted until 30 September 2022, or until the funding is fully allocated, whichever comes first. Call details will be sent to all NMIN PIs; please note that a pre-application consultation is required.

Please also note that this is a follow-on program tailored to support completed Round 1 and 2 projects with high commercial potential.

Projects may also be eligible for support from NMIN's [SI-Commercialization program](#) if they are significantly aligned with NMIN's mission and show exceptional potential to benefit Canada.

Questions: Rasika Kulkarni, Manager, Research Administration at rasikakulkarni@nanomedicines.ca.

NMIN's new Core Facility supports bench-to-bedside innovation translation

NMIN's new Early Health Technology Assessment (eHTA) platform supports the translation of NMIN-supported research results from bench to bedside.

This platform will provide education, coaching, and contract research services on the use of eHTA to inform a broad range of R&D and commercialization-related activities and decisions.

Specifically, these services include the use of economic evaluation methods like cost-effectiveness analysis to: identify target product profiles that maximize the potential value delivered by an innovation to stakeholders; develop societal impact assessments for grant applications; perform bottom-up market sizing for business plans; and inform strategies for generating evidence during clinical development that will ultimately strengthen reimbursement dossiers.

The overall goal of the platform is to enhance the value propositions of NMIN-funded technologies to healthcare payers by conducting early evaluations of their cost-effectiveness, thereby de-risking potential investments, licensing deals, and commercial partnerships.

In addition, the platform team aims to strengthen investigator and trainee capacity to understand, commission, and conduct eHTAs, which will help them understand the societal considerations of technology development decisions, and to develop business models with compelling value propositions throughout their careers.

Initial consultations are open to all members of the network. The eHTA platform team looks forward to collaborating with NMIN-funded project teams to co-develop grant applications to fund eHTA case studies relevant to their specific technologies, both through NMIN's SI-KTEE/Commercialization Support program and through external opportunities.

Questions/inquiries: kristina.michaux@ubc.ca



The eHTA team, L to R: Dr. Nick Dragojlovic (Technical Lead); Elisabet Rodriguez Llorian (Post-doctoral Research Fellow), Kristina Michaux (Research Coordinator), and Dr. Larry Lynd (PI).

RESEARCHER NEWS

Dr. Pieter Cullis was recognized for his contribution to COVID-19 mRNA vaccine technology with the [Prince Mahidol Award](#), and profiles in [The Lancet](#) and [The Globe & Mail](#).



[READ MORE](#)

Entos Pharmaceuticals Inc., led by Dr. John Lewis, received the 2020 BioAlberta Achievement award for Company of the Year. Dr. Lewis previously received BioAlberta's 2018 Scientific Achievement and Innovation Award.



[READ MORE](#)

Dr. Gang Zheng was featured on a UHN podcast, discussing his development of the porphysome: a unique nontoxic nanoparticle made with lipids and pacific algae.



[READ MORE](#)

Dr. Bruce Verchere is co-leading the newly launched JDRF Centre of Excellence in Type 1 diabetes research—the first such Centre in Canada.



[READ MORE](#)

New Theme II Accelerator

The new Theme II: Gene Therapy KTEE & Research Accelerator is UBC Post-doctoral Fellow Dr. Miffy Cheng (PhD), reporting to Theme co-leaders Drs. Pieter Cullis and Christian Kastrup.

She can be reached at miffy.cheng@ubc.ca



New Manager, Research Administration

As of 19 October 2021, NMIN has a new Manager, Research Administration: Dr. Rasika Kulkarni (MSc, PhD).

She can be reached at rasikakulkarni@nanomedicines.ca



[READ MORE](#)

Online Resources on NMIN Research

The NMIN website is your one-stop source for information about who's in the network, what research NMIN is supporting, and the outputs generated by NMIN research. The website features:

Neutrophil encapsulation platform for targeted drug delivery

Theme I: Targeted Drug Delivery

Host institution: University of Toronto

To achieve targeted, cell-mediated drug delivery, this project proposes to hijack human white blood cells (neutrophils) and use them to deliver drugs. *In vitro* generated neutrophils, loaded with liposomes containing rational combinations of therapeutics, will naturally migrate to sites of disease characterized by inflammation, leading to localized drug delivery and reduced systemic toxicities.

Through collaboration with CCRM (Centre for Commercialization of Regenerative Medicine), our project team can generate large numbers of human neutrophils *ex vivo*, which we have demonstrated can be successfully loaded with liposomes.



PI: Christine Allen
Collaborators:
Mitchell Cairo (New York Medical College); Robert Hancock (UBC)

NMIN Project Database

describing every NMIN-supported research project, with a project overview and details about the researchers and partners involved.

Afsaneh Lavasanifar

Professor, University of Alberta

Researcher

Dr. Lavasanifar is Professor in the Pharmaceutical Sciences division of the Faculty of Pharmacy and Pharmaceutical Sciences at the University of Alberta. She is also the Scientific Chief Officer and Vice President of Meros Polymers Inc., a spinoff company established on basis of technology developed her lab.

Her research is focused on the design and development of polymer-based delivery systems that can increase solubility, modify the pharmacokinetic pattern, reduce toxicity and increase the efficacy of different therapeutic agents. The ongoing research projects in her



NMIN project involvement:
PI: Nano-delivery of Novel Inhibitors of DNA Repair for Enhanced Therapy in Head

NMIN Researcher Database

profiling all investigators and collaborators on NMIN research, listing their NMIN project involvement.

Alhussan A, Bromma K, Perez MM, Beckham W, Alexander AS, Howard PL, Chithrani DB	Lockdown: Molecular Uptake and Retention of Gold Nanoparticles in Tumor Cells and in Cancer-Associated Fibroblasts	2021	Cancers (Base)	2021-RES-51-05
Anaiffano E, Korikow M, Norouzi M, James K, Ciolek S, Masum F, Saidat Mossavi P, Guo Y, Tang L, Syder A, Ma D, Pearson JD, Trcka D, Pietette M, Ambagala A, Babuk S, Pickering B, Wana J, Bremner R, Mazzilli T, Sinton D, Brumell JH, Green AA, Pardee K	A Glucose Meter Interface for Point-of-Care Gene Circuit-based Diagnostics	2021	Nature Communications	2019-13-03
Carlson TM, Zhang L-H, Ross CID	CRISPR/Cas9 Editing: Sparking Discussion on Safety in Light of the	2020	Human Gene Therapy	2019-12-05

NMIN Publication Database

listing the peer-reviewed publications emerging from NMIN research, with links to the full-text versions.

Name	Title	Institution	PI	Theme/Program	NMIN Project
Sheldon Decombe	An ultrasensitive digital nanosensor for immunotherapy effectiveness	University of Toronto	Aaron Wheeler	Diagnostics	An ultrasensitive digital nanosensor for immunotherapy effectiveness
Quinn Matthews	A platform for automated functionalization of lipid nanoparticles for CAR T cell therapy	University of Toronto	Keith Pardee	Diagnostics	On-Demand Biofunctionalization of Lipid Nanoparticles for CAR T Cell Therapy

HQP Research Presentation Database

with links to posters and videos of presentations by NMIN HQP about their research, including research from NMIN-supported projects.

Archive of NMIN Lectures

Learn more about NMIN research in *NMIN Lectures*, which focus on the activities and successes of NMIN investigators and/or Network research. Recordings are available of *NMIN Lectures* by Drs. Warren Chan, Pieter Cullis, Christian Kastrup, and Afsaneh Lavasanifar. [Access the recordings.](#)

NMIN Researchers:

SHARE YOUR RESEARCH NEWS WITH NMIN

And we'll share it with the world!

Did you win an award? Get a new grant? Publish a new paper? Receive a new honour?

Tell the NMIN staff about it, and we'll help make sure that word of your success gets out.

Our mailing list includes over 1200 members of the nanomedicine community in Canada and beyond, our newsletters and tweets reach even more readers, our press releases are received by dozens of media outlets, and the NMIN website averages over 6,000 page views each month.

We'll also ensure that the research outputs of your NMIN-supported research—patents, publications, spin-offs, etc.—are prominently highlighted online, in our communications, and in our NCE reporting.

KEEP NMIN INFORMED
info@nanomedicines.ca



Online Capacity-building Resources

Over the past 2.5 years, NMIN has delivered a range of capacity-building opportunities, including webinars, lectures and partnered events. Recordings of most of these sessions are available on NMIN's website.

IP Management

The webinar [Navigating Intellectual Property \(IP\) Risk](#) provides practical tips and tricks on how to manage IP risk throughout product development.

[Best Practices in IP Management](#) reviews NMIN's three interactive [IP Management Tools](#) about when to patent, freedom to operate, and filing a patent.

Commercialization/Start Ups

[Developing an Entrepreneurial Mindset](#) outlines paths by which to take breakthrough inventions from lab to market.

The series [Business Models for NanoMedicine Researchers](#) explores science-based business models for translating scientific results into real-world impacts.

Funding Opportunities

The [Mitacs Internships & Fellowships Opportunities](#) webinar describes Mitacs' Accelerate and Elevate Programs, and how to access the approx. \$6.5M allocated by Mitacs for NMIN HQP.

Gene Therapy Tools

[rhAmpSeq™ CRISPR: Multiplexed Amplicon Sequencing and Analysis](#) discusses this tool for generating NGS-ready libraries, while [Recent Advancements in CRISPR Reagents](#) explores additional new gene editing tools.

Communications

[Preparing Clear-Language Research Summaries](#) presents practical tips and tricks for clear-language science communication.

The [Connect and Communicate with Confidence](#) workshop series provides tools for delivering more effective presentations; using graphic design; and honing your leadership and mentoring skills.

Research

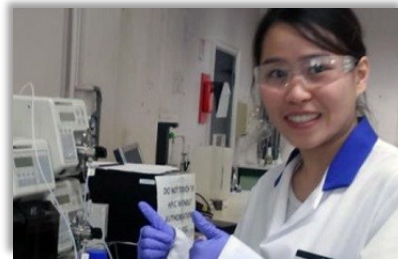
[Lectures](#) by NMIN researchers and invited speakers including [Dr. Molly Stevens](#) are online, as are videos from partnered events including: [NMIN's 2019 Scientific Meeting](#), Vancouver Nanomedicine Day [2020](#) and [2021](#), [Developing Genetic Drugs using Nucleic Acids and LNPs](#), and [Investing in Canada's Nanomedicine Ecosystem](#).

Commercialization Planning

[Designing Effective Commercialization Plans for Grant Proposals](#) explores commercially relevant evaluation criteria such as market size and competitiveness, and explains how to design studies with endpoints relevant to potential commercial partners.

More info: leahgraystone@nanomedicines.ca

NMIN Postdoctoral Fellowship in Gene Therapy awarded



With Dr. Pieter Cullis (UBC), Dr. Miffy Chang is developing new ionizable and functionalized lipids to more effectively deliver siRNA for cancer therapy.

[READ MORE](#)

HQP Research Presentations

The sixth round of this series highlighting NMIN research and the presentation skills of NMIN HQP took place 28 October, on the topics: [Non-equilibrium Structural Dynamics of Supercoiled DNA Plasmids](#); [RNA: The Key to Improving Platelet Transfusions?](#) and [Development of lipid nano-particle-enabled gene therapy approaches in the brain](#).

Round 6

NMIN HQP Research Presentations



Cameron Hastie
University of British Columbia



Madelaine Robertson
University of British Columbia



Sarah Thomson
University of British Columbia

[VIDEOS & POSTERS](#)

CAREER OPPORTUNITIES



The Lynd Research Group & NMIN seek a PostDoctoral Fellow for a 2-year term to support the development of NMIN's [eHTA platform](#). [Read the job posting](#)



Cuprous Pharmaceuticals Inc. seeks a post-doctoral fellow with expertise in formulation development to prepare, characterize, troubleshoot, & optimize nanoformulations for *in vitro* & *in vivo* applications at various scales. [Read the job posting](#)



The Allen Lab at the University of Toronto seeks a Research Associate & a Postdoctoral Fellow in the field of nanomedicine & drug delivery. [Read the job posting](#)



Dr. Isabelle Brunette's research group at Université de Montreal seeks a postdoctoral fellow wishing to explore new frontiers in gene therapy & vision science. [Read the job posting](#)

KNOWLEDGE NUGGETS

Career search tips & tactics for NMJN job seekers

NMJN recently hosted three career-oriented webinars: [Resumes that Work](#), [Networking Your Way to a Better Career](#), and [Mastering Interviewing](#). Below, we highlight several immediately applicable tips and tactics shared during the first two sessions.

FOR YOUR RESUME

Before writing your resume, clearly understand and be prepared to articulate “who you are, what you do, and why it matters.” These key factors enable you to tell a compelling story about what you bring to any given position. Bonus tip: This information forms the content of your opening statement and elevator pitches!

Include accomplishment statements in your resume using the format Skill+How+Impact. For example: “effectively trained and coached [skill] 15+ new employees in 2020 on new procedures to manage complaints [how], increasing customer satisfaction by 25% [impact].”

FOR YOUR JOB SEARCH

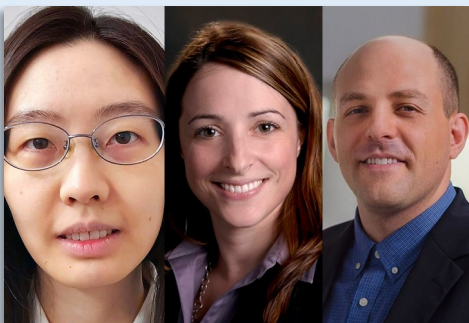
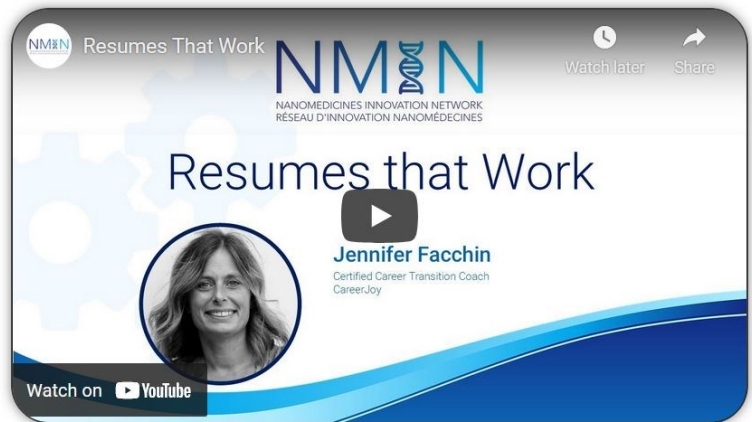
Access the “hidden job market” through networking—practice striking up conversations beginning with “NBR” (non-business related) topics—topics of a general nature, and ease into the fact that you are conducting a job search. Conclude with the “million dollar question:” Who else should I speak to?

Reach out to people that can provide you with a “warm introduction” to others that may be in a position to hire you or refer you to an organization that is hiring in your area of expertise. Identify people you know who can provide you with such introductions by answering these four questions:

1. I always get great advice from...
2. I love speaking to...
3. A role model I have is...
4. Someone doing well in their professional life is...

Recordings are available for these webinars

Click on the images to access



Featuring (L to R): Dr. Karen Chan (NanoCore Operational Lead); Dr. Nancy Dos Santos (PharmaCore Operational Lead) and Dr. Nick Dragojlovic (eHTA Technical Lead).

NMJN's Core Facilities: How they can help!

Monday 10 January 2022

12:00 -1:00 pm PST | 3:00-4:00 pm EST

Representatives of NMJN's three [Core Facilities](#) – NanoCore, PharmaCore and the eHTA – will explain how these platforms can benefit NMJN-supported research projects and platforms.

A Q&A session will allow attendees to discuss how these Core Facilities can facilitate their research and commercialization efforts. This webinar is intended mainly for NMJN researchers and trainees but everyone is welcome.

[INFO & REGISTRATION](#)



NMIN Lecture with Dr. Keith Pardee

Wednesday 26 January 2022

11:00 am-12:00 pm PST | 2-3:00 pm EST

Join us for the fifth NMIN Lecture, featuring Dr. Keith Pardee (University of Toronto) discussing his work at the intersection of synthetic biology and human health. Hear about how his lab is pioneering the development of *in vitro* devices to host cell-free synthetic gene networks for broad applications in research and human health.

[INFO & REGISTRATION](#)

Help strengthen Canada's nanomedicine ecosystem

Become a member of NMIN's partner organization **NanoCanada** and access opportunities to promote your nanotechnology businesses, products, or innovations.

[More information](#)



Congratulations

to NMIN partner organization Acuitas Therapeutics on winning the Global Impact Award from Life Sciences BC for its role in producing the Pfizer-BioNTech COVID-19 mRNA vaccine.



CALL FOR ABSTRACTS

NanoCanada's international conference program and advisory committees are pleased to invite authors to **submit abstracts** for contributed talks and poster presentations.

— DEADLINE JANUARY 14, 2022 —

About From Earth to Space

From Earth to Space will explore the latest deep tech advancements in nanomedicine, global societal challenges, sustainability, the future of transportation, and more. As part of this exploration, we'll look at deep tech's impact on the planet and some of today's global societal challenges.

LRD 2022

17th LIPOSOME RESEARCH DAYS

SAVE THE DATE

JUNE 12-15, 2022
University of British Columbia
Vancouver, BC, Canada

Organizers:
Terry Allen & Pieter Cullis
tallen@ualberta.ca, pieterc@mail.ubc.ca

nanomedicines.ca/LRD-2022/

 **THE UNIVERSITY OF BRITISH COLUMBIA**

KEY THEMES
Vaccines | Gene therapy | Gene editing | Chemotherapy | Lipid & membrane biophysics



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