

NM₂N

NANOMEDICINES INNOVATION NETWORK
RÉSEAU D'INNOVATION NANOMÉDECINES

NCE ANNUAL PROGRESS REPORT 2019-2020



NCE RCE

Networks of Centres | Réseaux de centres
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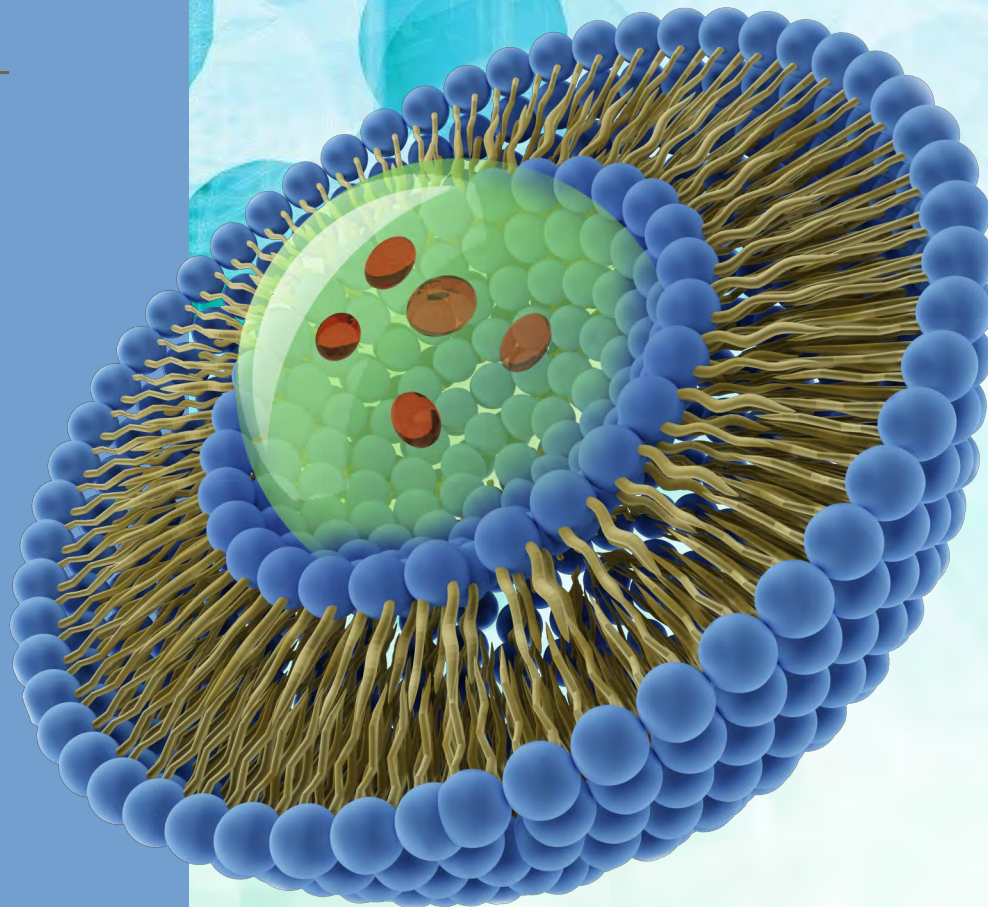




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A. YEAR IN REVIEW

On behalf of the NMIN Board of Directors, I am pleased to confirm that in fiscal 2019-20, the NanoMedicines Innovation Network (NMIN) successfully launched and is fully operational in all five NCE mandate areas. A summary of 2019-20 performance highlights is provided below.

Governance and Management

- A 10-person [Board of Directors](#), comprising leaders in industry, law, finance, venture capital, innovation, biopharmaceutical product development, pharmaceutical science and management and governance was appointed on 7 May 2019. Four (4) Board meetings were held in fiscal 2019-20, the first of which (7 May 2019) was an in-person meeting held in Vancouver jointly with the Networks' *Research Strengthening Workshop*.
- A complete set of NMIN operational policies and procedures, and Board and Committee Terms of Reference were reviewed and approved by the Board on 7 May 2019 as part of a comprehensive *Board Member Orientation Binder* issued upon appointment to each NMIN Board and Committee member.
- The NMIN [Administrative Centre](#) was fully staffed on 18 June 2019.
- The following NMIN Committees were established and have been active:
 - Board Executive and Nominating Committee - Three (3) meetings
 - Board Finance and Audit Committee - Three (3) meetings
 - [Research Management Committee](#) (RMC) - Five (5) meetings
- The following NMIN Committees were established:
 - NMIN [HQP Program Advisory Committee](#) (HPAC), which advises RMC on HQP programming.
 - [NMIN HQP Network \(NHN\) Executive Committee](#), which leads communications between the Network and its HQP and advises the HPAC and RMC on HQP policies and programs.

Rapid Research Program Implementation and Funding

- Two rounds of research funding calls were adjudicated (one closed to researchers named on projects in the successful NCE application and one open Canada-wide) with 26 projects receiving Board funding approval as follows: 22 research projects; two (2) Core facilities; one (1) Strategic Initiative - Research; and one (1) Strategic Initiative – KTEE.
- All conflicts of interest were managed in accordance with NMIN's Board-approved policy at every stage of the research proposal review and approval process.
- All project funding is issued in installments, and continued funding eligibility is subject to satisfactory progress and performance as evaluated by the RMC and approved by the Board.
- NMIN leveraged an additional 87 cents for every NCE dollar it invested in research, for a research leveraging ratio in 2019-20 of \$1 NCE:\$0.87 Non-NCE. Network-wide, for every NCE dollar spent, NMIN raised an additional 69 cents, for an overall leveraging ratio in 2019-20 of \$1 NCE:\$0.69 Non-NCE .

HQP and EDI Initiatives

- NMIN has taken proactive measures to increase the participation of women and early-career investigators. For example, at the May 2019 [Research Strengthening Workshop](#), the September 2019 [Scientific Meeting](#) and in the recruitment of members to the HPAC, early-career individuals from diverse backgrounds at universities across Canada were invited to join who had not participated in the development of the successful grant application but would benefit from NMIN's networking and capacity-building opportunities.
- A detailed *NMIN HQP Strategic and Operational Program Plan* and a *COVID-19 Modified HQP Program Implementation Plan* were developed and Board-approved. This plan includes multifaceted



HQP “value-added capacity-building” programs and initiatives, including a learning credentialing system developed with input from curriculum development experts at The University of British Columbia (UBC).

- The [NHN Executive Committee](#) was established, comprised entirely of NMIN trainees who play a leadership role in the planning and delivery of NMIN’s HQP programs, networking activities and other capacity building-related Network initiatives. The President of the NHN Executive Committee sits on the NMIN Board as an Observer and on HPAC as a voting member; the Vice-President sits on the RMC as a non-voting member, representing the voice of HQP in NMIN decision-making processes.
- The HPAC, comprising nine (9) members from across Canada, has broad representation geographically, is multidisciplinary and gender balanced. This advisory committee to the RMC provides recommendations on training and programming opportunities that increase the knowledge, skills and expertise of trainees and new professionals in the field of nanomedicines.
- NMIN has signed two (2) Memorandum of Understanding over the past year expanding the reach and impact of its HQP programming: 1. with Mitacs - three (3) NMIN HQP were approved for Mitacs internships with industry partners; 2. with the [Precision Medicine Initiative](#) (PRiME) at the University of Toronto to partner on mutually beneficial HQP programming that increases the breadth and depth of the capacity-building reach and impact of both organizations.

Networking and Partnership Engagement

- NMIN engaged 60 partners participating in and contributing to the Network, of which 50% are industry partners. NMIN has 35 partners investing in Network research as follows: 11 industry partners; nine (9) universities; six (6) hospitals or care centres; four (4) not-for-profits, foundations, charities, or associations; two (2) federal departments and agencies; and three (3) others.

- Weekly Research Leaders meetings have been held since January 2019 (38 in 2019-20) to facilitate networking and research communications. NMIN-funded investigators and their trainees are regularly invited to present their NMIN-supported research projects and discuss progress, challenges and new opportunities with Theme Leaders and Platform Administrative Leads. The NCE Liaison, B. Viens, regularly attends these weekly meetings and provides valuable advice.
- Significant outreach to and interactions with the broader community in Canada and internationally have been realized over the past year through NMIN executives’, researchers’ and trainees’ participation as conference presenters, workshop presenters and keynote speakers at national and international events.

KTEE

- NMIN co-led the development of the [Nanomedicines Day Vancouver](#) 2019, 12 September 2019, and led the industry engagement and sponsorship program for the event.
- NMIN’s first [Scientific Meeting](#) was held on 13-14 September 2020 (attendees: 37 NMIN HQP; 25 industry and partner organization representatives; seven [7] NMIN Board and Committee members; four [4] Networking affiliates; two [2] Tri-Council Agency representatives; one [1] guest speaker; six [6] NMIN Administrative Staff). Post-conference evaluation results were extremely positive with >96% of attendees rating the event as Excellent or Above Average.
- NMIN secured the right to host the international [Liposome Research Days](#) (LRD) conference in Vancouver, Canada in June 2021. Planning has been underway since September 2019. NMIN research project results and trainee posters will be featured at this prestigious international event.

B. Performance Against Program Review Criteria & Network Objectives

B1 - Excellence of the Research Program

OVERVIEW: With 26 projects funded in Year 1, NMIN fully launched the Network Research Program as set out in the successful NCE application. Through rigorous peer review criteria aligned with NMIN's mission and vision, 22 Research Projects, two Core Facilities, and two Strategic Initiatives were selected from 40 applications, representing a 65% success rate. The Round 1 Call was completed in August 2019 with funds issued in September 2019. The Round 2 Call was completed and funds issued in March 2020. At the end of the fiscal, 80-90% of the Year 1 research funding had been issued, with ~10% held back, to be released contingent on the submission of an RMC-approved progress report (due to COVID-19 delays, to be submitted in December 2020).

RESPONSIVENESS TO COVID: Deadlines for Research Project progress reports have been extended, and the research budget has been amended¹ for Round 1 and Round 2 research projects, to ensure that NMIN investigators will be able to complete projects that were delayed or had to start over because of institutional shutdowns. Strategic consultations with researchers on the impacts of the COVID-19 pandemic are ongoing. Nimble responses from the Network enabled support for COVID-19 research projects through its Strategic Initiatives research project funding stream. NCE to Non-NCE research partner funding realized was in the order of ~1:0.87, illustrating the relevance of NMIN research investments for the 35 partner organizations from across sectors of the economy.

EQUITY, DIVERSITY, AND INCLUSION CONSIDERATIONS: All research project applicants were required to complete an EDI section proposal detailing: how EDI issues will be addressed; the applicant's EDI philosophy or "way of working" and track record; EDI-related goals and actions to be taken; and EDI-related targets for the NMIN-supported research teams.

Elements within Excellence of the Research Program: The excellence, focus and coherence of the research program

- NMIN assembled all Network investigators to develop research proposals, to network and to facilitate new collaborations at a [*Research Strengthening Workshop*](#) (7-8 May 2019) and later all funded investigators and their trainees were invited to attend NMIN's first *Scientific Meeting* (13-14 September 2019) [see also Section B3].
- A "formative approach" was used to ensure strategic alignment and excellence of the research proposed for funding. Activities included:
 - Formative feedback provided by Research Leaders and attendees to all applicants after the *Research Strengthening Workshop*.
 - If applications were not scored as "A – approved as presented" by the RMC, applicants were provided with formative feedback and invited to complete a "lightning-round" of revisions.
 - If applications did not reach the expected level of excellence after the first round of formative feedback, the projects were provided an additional round of formative feedback and welcomed to reapply in the next call for proposals.
- National teleconferences were held by Theme Leaders, the Scientific Director, and the Executive Director to respond to applicant queries around the Round 1 Call.
- A Network-wide list of Frequently Asked Questions (FAQs) was circulated to ensure a "level playing field" of knowledge and information among all applicants.
- Applicants invited to apply to the Round 2 Call were able to fill gaps in the expertise and diversity of individuals and teams funded by NMIN. An additional six (6) new projects were identified, with four (4) approved before the end of the fiscal year.
- Theme-specific teleconferences are held for all investigators to provide regular updates on the Network and on project progress.

The balance between research into new discoveries and the application of research breakthroughs to address practical problems facing Canadians

- NMIN funds both Research Projects (Proof of Concept and Proof of Principle) and Strategic Initiatives (SI), with a focus on moving discoveries to commercialization. Both types of projects must respond to complex research opportunities and address gaps that no single investigator or lab could tackle working alone. Proposals leveraging one or both of the Network's Core facilities (NanoCore and PharmaCore) were prioritized, as were projects with clear potential for commercial impact.

Fig. 1: NMIN Research Investments 2019-2020



The achievements of the researchers in the continuum of research and their ability to contribute to the realization of the Network's objectives

- Feasible go/no-go milestones were required in research funding applications. The RMC and NMIN Administrative Centre team have mentored applicants where the go/no-go milestones and research proposed were not at an acceptable level of excellence. Five (5) publications emerged from research, including two [2] specialized publications, and three [3] refereed publications in top journals: *Nature Nanotechnology*, *American Chemical Society (ACS) Nano*, and *Drug Delivery and Translational Research*.

The value added by the Network's multifaceted approach, in terms of having all the critical linkages in place to generate world-class research breakthroughs, to apply that knowledge to practical solutions, and to commercialize innovations that produce social and economic benefits

- NanoCore and PharmaCore, NMIN's Core facilities, have created significant new research opportunities for Canadian nanomedicine research. Not only have 19 of 24 funded research projects (79%) opted to collaborate with these two NMIN-initiated and funded Core facilities, these Core research platforms have also been identified as legacy initiatives for the Network, with planning already underway for them to spin-out as a new, for-profit company (NanoCore) and an academic CRO (PharmaCore) by 2025.
- NMIN's research leveraging ratio in 2019-20 of \$1 NCE:\$0.87 Non-NCE partner cash and in-kind investment illustrates the relevance and value of NMIN's research program to the generation and application of new knowledge to practical solutions, and the potential commercialization of innovations that have high potential to generate social and economic benefits for research partners.

The extent to which the program will contribute to Canada's abilities and reputation for international leadership in areas of high economic and social importance to Canada

- NMIN's Scientific Director, Research Leaders, Network Investigators and HQP have already been recognized as global leaders in the nanomedicines research and commercialization field. In the context of this NCE, NMIN researchers are attracting additional new global companies to Canada to invest in leading edge research in Lipid Nanoparticle (LNP) delivery systems and new diagnostic tools and therapeutics to address and potentially cure currently untreatable diseases.

The extent to which new and emerging social and ethical challenges are an integral part of the research program

- NMIN's [Strategic Initiatives Research Program](#) (open call) enables a rapid Network response to just-in-time research, commercialization and knowledge mobilization opportunities. By 31 March 2020, ten

(10) Expressions of Interest were received, and two (2) Strategic Initiative projects were funded - one of which was focused on developing therapeutics for COVID-19.

- Specific efforts have been made to include rare disease patient organizations and their research needs into the strategic research planning process. Consultations towards a clinically oriented project on rare disease therapeutics is ongoing.
- Significant effort was made to consult with economists, other social science researchers, and rare disease foundations that are currently developing a collaborative programmatic proposal for research on the social, policy, ethical and economic issues of drug development costs for rare diseases and the often prohibitive costs to patients and health systems to access new rare diseases therapeutics.

The relationship of the proposed research program to similar work conducted in Canada and abroad

- NMIN is conducting leading edge research in each Theme, and the RMC and Board of Directors ensure that NCE funds are not invested in projects where unjustifiable duplication of effort is a risk. NMIN researchers are in regular communication with the top researchers in their fields from around the world, and students are being recruited to work on NMIN-funded research projects from top labs across Canada and around the world.

B2 - Development of Highly Qualified Personnel

OVERVIEW: NMIN Investigators have recruited 91 exceptional HQP to support NMIN-funded Research Projects. These HQP have been actively engaged in the Network, and have access to the Network's value-added, capacity-building HQP Program. A detailed HQP Strategic and Operational Program Plan has been developed. There are ten (10) HQP capacity-building initiatives: six (6) NMIN-led opportunities, three (3) investigator/HQP-led opportunities, and one (1) industry-driven, needs-based training opportunity. Overarching these ten initiatives is a modularized, self-selected Advanced Trainee Experience that is Network credentialed, where HQP build towards an NMIN certificate through completion of combinations of Network-

supported capacity-building and training program offerings.

RESPONSIVENESS TO COVID: A COVID-19 Modified HQP Program Implementation Plan has been developed and approved by the Board, allowing the roll-out of the value-added, capacity-building programs through remote access. Examples of these adaptations include development of NMIN Remote Training Workshops, providing all NMIN Training Initiatives virtually, and providing Skill Development Awards to make remote learning opportunities available.

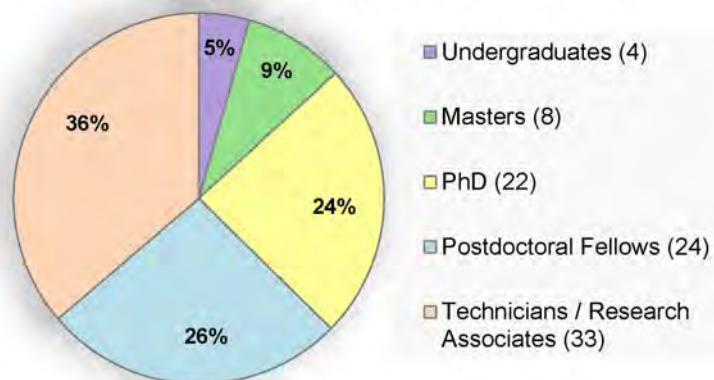
EQUITY, DIVERSITY, AND INCLUSION CONSIDERATIONS: A detailed [*EDI Framework*](#) has been developed. EDI training for all Network members (Committee members, investigators, HQP, and staff) has been arranged, and is to be completed online over a three-month period from July–September 2020. Demographics of potential Committee membership for the two HQP-related Committees were reviewed to ensure that Committee membership mirrored the diversity of Canadians and a cross-Canada Network. HPAC members are non-NMIN-funded researchers that are early- to mid-career faculty with a high commitment to mentorship and training. This extends the reach of NMIN's impact and broadens the Network's range of advice provided on training priorities and investments.

The ability to attract, develop and retain outstanding researchers in research areas and technologies critical to Canadian productivity, economic growth, public policy and quality of life

- NMIN has 91 HQP working on NMIN-funded research, including postdoctoral fellows, PhD and master's students, undergraduates, research assistants and technicians, and research associates.

"As a trainee, the opportunity to participate in the Scientific Meeting and have the history and prospects of nanomedicine contextualized by many of the field's frontrunners was invaluable. Beyond this, being able to participate in this discourse and better inform the trainee experience was surreal, and I hope to continue to be able to play a role in NMIN's relationship with aspiring graduate students and research technicians."

Fig 2: Highly Qualified Personnel 2019-2020



- HQP are actively engaged in the Network's research program. HQP were invited to the 2019 *Scientific Meeting* (see Section B3), and Investigators were required to support at least one HQP to attend the event with them.
- A "permeable membrane" has been created around the Network, with the development of the NHN application process where trainees working on related nanomedicines research can apply to join the NHN, even if they are not working in the lab of an NMIN-funded researcher or on an NMIN-funded project.
- NMIN responded to concerns around lack of PDF-level funding by developing NMIN's inaugural [Postdoctoral Fellowship Awards](#), with two outstanding award recipients in March 2020.
- NMIN supports capacity-building for researchers and partner organizations by providing them access to NMIN [Training Initiatives](#) within the HQP Program.
- NMIN has partnered with two (2) companies on three (3) Mitacs fellowships that provide hands-on industry training for three (3) NMIN HQP.

Training strategies that expose HQP to the full range of economic, social, and ethical implications of the Network's research by involving them in activities from the initial research discovery to its application through to practical social and economic benefits

- NMIN ensures HQP have access to exceptional training opportunities through Network partnerships. Two Memorandums of Understanding have been executed in the HQP Program- with Mitacs and the Precision Medicine Initiative (PRiME) at the

"The NMIN Postdoctoral Award is the precise thrust I need to launch myself in academic research. It represents an outstanding opportunity to advance my research portfolio toward becoming an accomplished professional in nano-drug delivery."

— **Dr. Noorjahan Aibani**, NMIN PDF Awardee in Targeted Drug Delivery

University of Toronto.

- Mitacs representatives have been actively involved through inclusion of and presentations by a Mitacs representative at the 2019 *Research Strengthening Workshop* and 2019 *Scientific Meeting* to explain and promote Mitacs HQP support program opportunities.
- A detailed operational plan for NMIN's HQP Program was developed to provide training and capacity-building across the full range of economic, social, and ethical implications of the Network's research, as shown through the Priority Areas and Strategic Goals:

Priority Area 1: Nanomedicine Research Skills and Experience

- Strategic Goal 1: Equip trainees with core, cutting-edge research skills in a world-class research environment (also addressed through the Research Program)

Priority Area 2: Intellectual Property (IP) Creation and Commercialization Skills and Experience

- Strategic Goal 2: Provide specific training in IP creation, identification, protection, and commercialization

Priority Area 3: Entrepreneurial and Leadership Skills and Experience

- Strategic Goal 3: Provide opportunities for hands-on/experiential learning opportunities for the development of business-relevant entrepreneurial and leadership skills

Priority Area 4: Communication and Knowledge Mobilization Skills and Experience

- Strategic Goal 4: Provide specific training on knowledge mobilization to prepare trainees for communicating their research to the public, policy makers, and industry.

Priority Area 5: Genetics, Ethical, Environmental, Economic, Legal and Social (GE³LS) Issues Awareness and Understanding

- Strategic Goal 5: Provide specific training on GE³LS issues and increase trainees' awareness and understanding of these concepts.

- NMN's capacity-building webinars program was launched, with [Developing an Entrepreneurial Mindset](#) with speaker Dr. Elicia Maine, W.J. VanDusen Professor of Innovation & Entrepreneurship in the Beedie School of Business at Simon Fraser University.

B3 - Networking and Partnerships

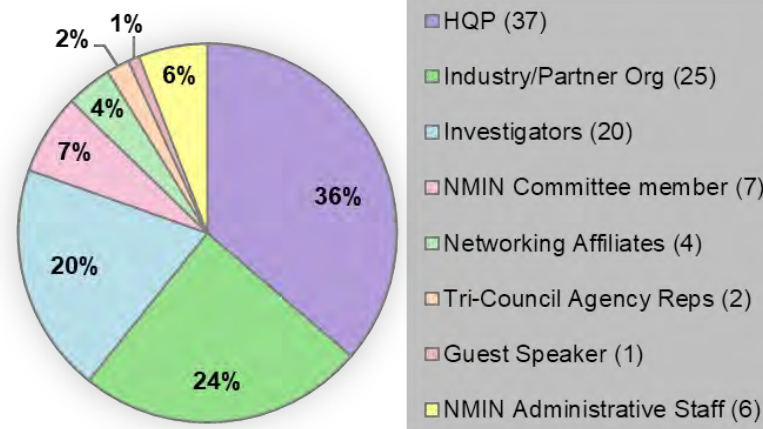
OVERVIEW: Held three major events:

- 2019 [Research Strengthening Workshop](#) (7-8 May 2019), with thirty-eight participants. The program included presentations about all proposed research projects and discussions of Research Themes, and helped to develop connections among Theme participants.
- [Vancouver Nanomedicine Day](#) 2019 (12 September 2019). NMN led fundraising, with \$27,104 raised from 16 partners.
- 2019 [Scientific Meeting](#) (13-14 September 2019), with 102 delegates. The *Scientific Meeting* was well received, with 96.4% of respondents to the Post-Event Evaluation rating the event as Excellent or Above Average. Sessions included: "101" sessions to build a "common language" among Network members across Themes; presentations by key industry partners on gaps in skill/expertise, employment opportunities, scientific priorities, and recent discoveries in the sector; and a panel discussion entitled "Lessons from the School of Hard Knocks: Establishing a company to protect and develop your IP." Sessions were videotaped and are available to Network members.

RESPONSIVENESS TO COVID: All in-person meetings have been cancelled at this time. To continue supporting networking and collaboration, NMN is holding video- and tele-conferences with Investigators and HQP.

"A Scientific Meeting highlight was the *Lessons from the School of Hard Knocks*. I have never attended a session like this before. It was absolutely amazing."

Fig. 3: 2019 Scientific Meeting Delegates



EQUITY, DIVERSITY, AND INCLUSION CONSIDERATIONS: Seven early- to mid-career investigators who did not have NMN projects were invited to the *Research Strengthening Workshop* and *Scientific Meeting* to engage and network with Network Members. One of these networking affiliates was identified and recruited to Chair the HPAC, and three other networking affiliates were identified and appointed as members of the HPAC training committee.

Elements within Networking and Partnership: Effective research and technology development links between national and international academic institutions, federal and provincial agencies, non-governmental organizations and private sector participants

- The Scientific Director, Executive Director and Manager, Research and Partnerships have held 173 meetings with partners and stakeholders over the past year (Scientific Director, Dr. Pieter Cullis, 49; Executive Director, Dr. Diana Royce, 74; Manager, Research and Partnerships, Daniel Rogers, 50).
- 60 partner organizations are participating in and contributing to the Network and its projects.
- Three Theme-specific teleconferences were held to network, discuss project progress to date, and identify potential concerns. Teleconferences had 100% attendance.



The history of partnerships with complementary organizations and how the proposed network will build on these partnerships and how it will accelerate the development of the proposed network

- Strong relationships have been built between NMIN and local and national multi-sectoral organizations over the past year, including: NanoCanada, Life Sciences BC, Industry Canada, Health Canada, Genome Canada and the National Research Council of Canada. NMIN Investigators' 60 Network partner collaborations with organizations across sectors has generated \$809,530.21 in cash and \$644,641.00 in cash equivalents through in-kind contributions, resulting in an NCE:Non-NCE research funding leveraging ratio in Year 1 of approximately \$1 NCE: \$0.87 Non-NCE and a Network-wide NCE leveraging ratio of \$1 NCE: \$0.69 Non-NCE.
- Multidisciplinary, multisectoral approaches in the research program
- NMIN's two core research platforms, NanoCore and PharmaCore, provide cross-thematic support to the 79% of NMIN's diagnostics, therapeutics, and drug delivery research projects. Figure 4: Partners by Sector 2019-2020 illustrates that Network research project

"A Scientific Meeting highlight was the size of the meeting, which made it very easy to connect with individuals at breaks or meals. I'm new to this community, and found it easy to introduce myself to people."

partners are drawn from six diverse partner sectors.

Demonstration that the right partners/individuals are at the table to address the proposed issue, including international partners when applicable

- RMC assessment of Research Funding applications include a review and assessment of all project partners. Where appropriate, both the RMC and Board of Directors provided formative input regarding additional partnerships to explore and/or provided introductions to specific new partnership opportunities/relationships.

- 31% of NMIN's research partners are from industry, 11% are from the not-for-profit sector, and 17% are from the hospital sector. Universities are major research collaborator representing 26% of all partners.
- The Administrative Centre has invested in building strong relationships over the past year with national (e.g., NanoCanada) and regional not-for-profit and patient organizations (e.g. Life Sciences BC; Toronto Innovation Acceleration Partners [TIAP]; Rare Diseases Canada; Canadian Organization for Rare Disorders [CORD]).
- NanoCore is currently developing collaborative research project partnerships with five (5) companies from around the world – USA (4), Denmark (1).

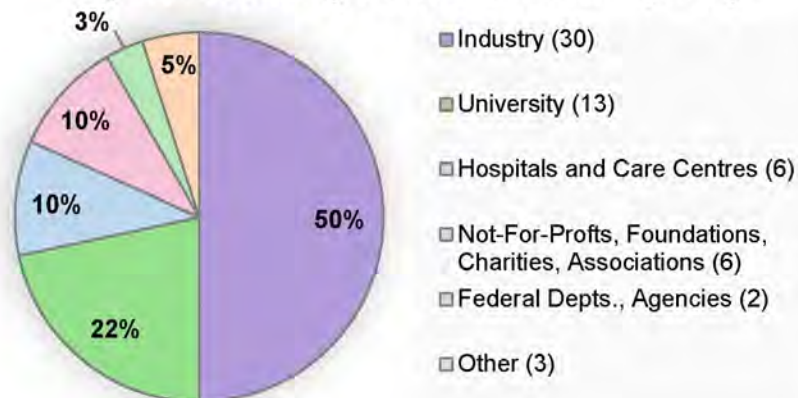
Optimization of resources through the sharing of equipment and research facilities, databases and personnel

- Supported development of collaborations between investigators at the 2019 Research Strengthening Workshop.
- Further identification and strengthening of potential collaborations and knowledge exchange achieved through Theme teleconferences and Network-wide leveraging of core platforms/facilities.
- NanoCore and PharmaCore expertise and services are extensively leveraged by a majority (79%) of NMIN-funded research projects (Round 1 research projects N=15/20 projects [75%], Round 2 research projects N=5/6 [83%], and Round 2 Strategic Initiatives N=1/4 projects [25%]).²

"Although I was not aware of the network at the time the application submitted, the event [Research Strengthening Workshop] was an excellent opportunity to meet the other researchers from similar areas. I had very informative networking with other researchers and the event led to collaborative work and a grant with Dr. Hancock's group at UBC. I am going to apply to the upcoming grant application through NMIN."

— **Azita Haddadi**, networking affiliate

Fig. 4: Partners by Sector 2019-2020 (n=60)



Presence, nature, and extent of contributions from the private, public and not-for-profit sectors, and from international partners, as well as the prospect for increasing commitments as the work progresses

- NMIN leveraged an additional 87 cents from research partner organizations across sectors for every NCE dollar it invested in research for a research leveraging ratio of \$1 NCE:\$0.87 Non-NCE.
- Five active partnership discussions are underway between industry partners (Leo Pharma, Denmark; Kernal Biologics, Massachusetts, US; Peel Therapeutics, Utah, USA; DNALite, California, USA, IDT, USA & Canada) and the NanoCore, with collaborative research agreements being developed, which will bring additional R&D non-NCE investments into Canadian universities.
- Partner investments in all research projects is expected to increase over the coming year to achieve at least 1:1 leveraging of NCE: Non-NCE investments in Network research.
- The Scientific Director partnered with Dr. Kaushik Pal from the Shastri Indo-Canada institute on an application for an international Canada-India trainee exchange program (outcome pending).
- Capacity building/skill development partnerships completed with Integrated DNA Technologies on the delivery of a Symposium entitled [Developing Genetic Drugs using Nucleic Acids & LNPs](#), 6 February 2020.

"Genetic-based drugs comprise one of the most exciting areas of new therapeutics development in medicine today... NMIN and the NanoCore were established to develop novel delivery platforms to facilitate administration of these compounds...

"The initiative brought into existence an organized network of labs working on this problem along with a Core facility that can perform formulation/encapsulation of drug compound into the delivery vehicle as a service to researchers. The initiative is already producing novel delivery tools with unique properties and the Core facility is proving to be a welcome resource to all.

"IDT is pleased to collaborate with NMIN and to work with the NanoCore to help speed these new technologies to market and get a new generation of useful tools into the hands of researchers."


— Integrated DNA Technologies

B4 - Knowledge & Technology Exchange & Exploitation

OVERVIEW: In Year 1, the focus has been to establish the Network and launch the Research Program, while building a foundation for KTEE. The Administrative Centre and Research Leaders have been working intensively with investigators to strengthen the commercial and translational foundations of each project to position them for IP generation, company creation, and social and economic impact.

RESPONSIVENESS TO COVID: NMIN has held multiple meetings with ISED, CIHR and industry representatives and is co-leading a number of initiatives that are under discussion to strengthen Canada's autonomy in terms of its capacity to produce mRNA-based vaccines with high potency in low dose.

EQUITY, DIVERSITY, AND INCLUSION CONSIDERATIONS: Faculty members from equity-seeking groups have increased demands on their time, through activities such as serving on committees, as reviewers, and as mentors. When Network demands on a Research Leader from an underrepresented group's time was identified as a concern, a *Research Accelerator* position was developed as a Strategic Initiative to decrease the demand on Research Leaders and



provide Network support around KTEE and the commercialization of research results. This position is a pilot project that will be assessed by the Board prior to renewal.

The social innovations to be implemented as a result of the network and the extent to which these will contribute to more effective public policy in Canada

- NMIN projects under development by a team of Canadian social scientists will address the issue of support for rare disease drug development and access to rare disease therapeutics in the Year 2-supported research program.
- The need for such a research program to inform future public policy decisions was confirmed in December 2019, with a meeting between NMIN's Scientific Director and >20 representatives of Health Canada in Ottawa, as well as consultations with CIHR Institute Directors and with Genome Canada. The increasing capability of nanomedicines research to generate therapies for rare hereditary diseases currently outpaces the capacity of the health system to evaluate them (due to the small number of patients suffering from each particular disease) and to control the costs of making such treatments available.

Effective collaboration with the private, public and not-for-profit sectors in technology, market development, and public policy development

- A user-friendly bilingual [website](#) was created early in 2019 so industry can easily determine how and where “to dock” with NMIN.
- The [NMIN Fast Facts](#) and [NanoCore Fast Facts](#) allow industry to quickly assess benefits of an NMIN partnership for their R&D division.
- A dedicated NMIN portal with Integrated DNA Technologies and NanoCore was developed to accelerate the R&D process and reduce the cost of key materials for NMIN investigators.
- In addition to the 35 research partnerships and five companies actively working with the NanoCore, NMIN's Scientific Director has participated in international policy dialogues regarding

management of the costs of nanomedicines to treat rare diseases at the invitation of Health Canada at the [Global Summit on Regulatory Science 2019 Nanotechnology and Nanoplastics](#) in Italy, 25 September 2019, which was organized by The European Commission's Joint Research Centre (JRC) and co-organized with the Global Coalition for Regulatory Science Research (GCRSR).

The extent to which the network will help partners develop strong receptor capacity to exploit current and future research breakthroughs

- Through partnership with Mitacs, NMIN is facilitating its trainees to work in industry by positioning them to leverage the leading edge of scientific discovery in nanomedicines.
- By working in close, meaningful collaboration with NMIN investigators, companies are able to exercise first right of negotiation (ROFN) to access new technologies and IP that benefits the establishment, growth and global scaling of Canadian companies in the nanomedicines sector.

The new products, processes or services to be commercialized by firms operating in Canada as a result of the network's activities and the extent to which these will strengthen the Canadian economic base, enhance productivity, and contribute to long-term economic growth and social benefits

- Go/no-go milestones for every Research Project focus research on commercial endpoints.
- Theme teleconferences support the early identification of commercial potential.
- The RMC and Board reviewed and approved a Strategic Initiative focused on developing therapeutics towards COVID-19, which will be leveraged for further funding.
- NMIN works closely with university tech transfer offices to facilitate IP agreements in advance of research commencing to ensure re-search outcomes can be commercialized.

Effective management and protection of Canadian intellectual property resulting from network-funded research

- NMIN is working closely with UBC's UILO office to prepare NanoCore to spin-off as a for-profit company post-NCE funding.
- A Freedom to Operate Report was completed by Perley-Robertson, Hill & McDougall LLP in September 2019 at NMIN's request to provide clarification and guidance in the use of specific LNP formulations in NanoCore operations.
- NMIN Investigators, NMIN's Research Accelerator and Administrative Centre staff are working closely with the UILO Officers at the institutions of each investigator to monitor/support commercial opportunities arising from NMIN-supported research.

The extent to which additional/complementary knowledge and/or technology a foreign counterpart is contributing to Canada, when international partnerships are relevant

- A number of international companies have indicated their desire to contract NanoCore to produce LNP systems for their gene therapy applications. We are currently negotiating with these companies to establish partnerships with mutual benefits.
- NMIN is playing a leading role in the organization of the international conference LRD 2021: [*Catalyzing the NanoMedicines Revolution*](#) to be held in Vancouver in June 2021. This conference will showcase Canada's globally leading role in nanomedicines R&D.
- NMIN is establishing focused relationships with academics internationally, these include relationships with like minded organizations in Europe and accessing required expertise in the US.

B5 - Management of the Network

OVERVIEW: Network management has been demonstrably efficient, effective, and nimble, having built upon the tacit knowledge and success from up to 20 years of experience within the NCE program by NMIN's scientific leader, Network executives, and some Administrative Centre staff.

RESPONSIVENESS TO COVID: The Administrative Centre has transitioned effortlessly to working off-site due to the already nationally networked administrative infrastructure in place, including laptops for staff and cloud-based servers from which to access corporate files. A COVID-19 Management Strategy specific to Research Delay Mitigation has been Board-approved, with \$750,000 from Year 3 earmarked for Year 2 research to ensure completion of Round 1 and Round 2 funded projects.

EQUITY, DIVERSITY, AND INCLUSION CONSIDERATIONS:

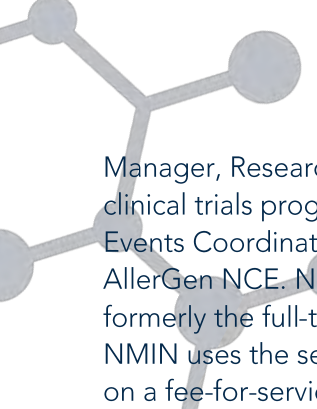
Utilization of the Board-approved [EDI Framework](#) occurs in all management and Board decision-making and recruitment efforts.

A board and committee structure to ensure that appropriate policy and financial decisions are made and implemented

- NMIN's governance structure consists of deciding and advisory bodies: A Board of Directors (decision-making), two advisory subcommittees of the Board (Executive and Nominating Committee, Finance and Audit Committee), the RMC (advisory to the Board), Research Leaders Committee, HPAC, and NHN Executive Committee – all advisory to RMC.
- Board approval has been secured for NMIN Bylaw No. 1, Committee Terms of Reference, Policies & Procedures, the NMIN HQP Strategic and Operational Program Plan, the EDI Framework, Communications Plan, and Partner and Stakeholder Engagement Strategy documents.
- NMIN's May 2019 Pandemic Policy was updated in March 2020, to provide specifics on NMIN's response to COVID-19 epidemic/pandemic conditions.

The presence of effective leadership and expertise in the research and the business management functions

NMIN hired an experienced NCE Executive Director, Dr. Diana Royce, who has been in NCE administrative leadership positions for nearly 20 years (HealNet NCE; AllerGen NCE) and provided advice to many current and previous NCEs as well as to the NCE program Secretariat as a consultant and invited speaker. The Network's



Manager, Research and Partnerships, had previously managed the clinical trials program for the Rick Hansen Foundation. The HQP and Events Coordinator previously ran the HQP and events programs for AllerGen NCE. NMIN's Digital Initiatives consultant (part-time) was formerly the full-time Manager, Digital Initiatives for AllerGen NCE. NMIN uses the services of a full-time Accountant employed by UBC on a fee-for-service basis.

Board membership is diverse, national and brings exceptional breadth of business, legal, financial and commercial expertise to bear on Network decisions concerning strategic directions and operational priorities for investment. For example, the Board adopted a strategic approach to optimize commercialization based on a March 2020 report from the Board Working Group on Commercialization Support Strategies, which interviewed 15 people/11 organizations across Canada.

This report led to Board approval of ~\$1M for KTEE. The Working Group recommended: the introduction of incremental amendments to the overall NMIN five-year budget; the strategic use of expert consultants on an as-needed basis to accelerate IP identification, protection and commercial development of research project results; building on existing academic and industry market demand/"pull" for the results of current and emerging NMIN research, core capacities and expertise; and taking immediate action to design criteria for funding eligibility that will:

- enable the provision of timely support to NMIN research projects demonstrating commercial potential;
- position NMIN to identify Network-supported IP that should be licensed into for-profit companies in a timely manner; and
- position NMIN to successfully implement a strategy to optimize the achievement of its NCE strategic goals for KTEE to 2024 and beyond.

The *NMIN – UBC Network Host Agreement* was signed on 2 August 2019, and 100% of the six (6) participating universities signed the NMIN NCE Network Agreement by 27 September 2019.

A defined strategic and operational plan highlighting the proposed Network's objectives and milestones

NMIN is currently performing against a modified version of its NCE application strategic plan (reduced budget and timeframe) and specific strategic and operational plans subsequently developed for HQP, communications/partner and stakeholder engagement/KTEE, EDI, and Board reports recommending tactics for optimizing commercialization of NMIN research discoveries and know-how and Conflict of Interest management. Each of these specific strategic and operational planning documents have received Board approval.

A defined governance process

The NMIN governance process, Board and Committee terms of reference, policies and procedures are set out in the *Board Orientation Binder*, a compendium of documents providing the framework for Network operations. Conflicts of Interest management is highly transparent, with Conflicts of Interest documented for all meetings/motions and decisions supported by evidence. NMIN has had a Conflict of Interest policy since its inception that has been rigorously adhered to. A *Board Working Group on Round 2 Research Program Design and Conflict of Interests* was struck to review and oversee NMIN policies and practices guiding research funding eligibility and processes in cases where the Scientific Director is an applicant or co-applicant for research funding.

Demonstrated and effective policies and controls to administer funding

- NMIN's board-approved policies and procedures include specific policies prescribing signing authorities to ensure that all financial transactions are appropriately documented and authorized before funds are expended. All senior executive expenses require a "one-above" signature on any expenses before they are eligible to be claimed. The Executive Director is required to review all expenses and sign, signifying that the claim is paid consistent with *NCE Program Guide* requirements.
- Research project and KTEE funding applications are reviewed by RMC, which recommends funding to the Board of Directors. An

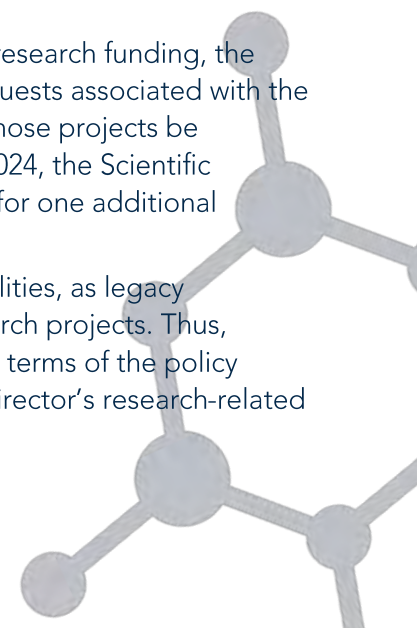
Table 1: Number of Meetings 2019-2020 (n=53)	
Board of Directors	4
Executive and Nominating Committee	3
Finance and Audit Committee	3
Research Management Committee	5
Research Leaders	38

“award letter” is issued by the Executive Director consistent with Minuted Board funding decisions. All NCE Network Agreement forms must be signed before NMIN releases funding via a second, separate “funding letter.” NMIN holds back 10% of every award instalment to ensure receipt of required progress reports. Each funded project has a go-no-go performance indicator and timeline that must be met before additional funding will be released.

- Establishment of a Board Working Group focused on “Round 2” Research investment Strategy/Program Design, and Management of Research-related Conflicts of Interest. A two-pronged strategy (Stream I and Stream II) was recommended to enable the Network to: mobilize a rapid response to short-term “windows of opportunity” for collaborations and “quick-win/knock on the door” research opportunities, as per the original strategy set-out in the budget plan; ensure NMIN credibility in terms of its capacity to undertake activities and participate in research and development collaborations/partnerships with industry and international initiatives; add new projects to fill subject matter gaps across Themes; add leading Canadian investigators to the Network who were not initially involved in the NCE application or who were unable to respond to the initial call for proposals in a timely manner; increase multidisciplinary of NMIN research teams; and increase geographic representation and diversity while adding important R&D capacity that accelerates the transformation of NMIN research into new products, services, and healthcare innovations.
- The following exclusions and restrictions to NMIN Research Funding to manage perceived Conflict of Interest have been approved by the Board of Directors:
 - NMIN Round 1 research funding recipients (PIs) were not eligible

to submit funding applications as the “administrative applicant” PI in Round 2. Round 1 research funding recipients could, however, participate in Round 2 projects as Co-PIs or collaborators

- The Scientific Director is not eligible to apply for Stream II: Discovery/Developmental Research: Strategic and Invited Projects funding.
- The Scientific Director is eligible to participate in all Round Two projects as a Co-PI or collaborator.
- The Scientific Director is eligible to apply for Stream I: Rapid Response/Strategic Initiative (SI) Projects. For Stream I: proposals presented by the Scientific Director, a modified two-stage screening process will be undertaken as follows:
 - Stage 1: documented teleconference/meeting with one or both Theme Leaders, along with a non-research member of the RMC with relevant expertise, to confirm the proposed project’s scientific, commercial and or translational relevance to NMIN’s research, commercialization and knowledge mobilization goals
 - Stage 2: For proposals involving the Scientific Director, the Stage 2 review to confirm strategic alignment with NMIN’s NCE mandate will be conducted simultaneously at Stage 1, by one or both Theme Leaders, along with a non-research member of the RMC with relevant expertise.
- In Round 3 and for other future rounds of research funding, the Scientific Director is limited to funding requests associated with the continuation of existing projects. Should those projects be completed or terminated prior to March 2024, the Scientific Director is limited to applying for funding for one additional project per funding round.
- The Board took the position that Core facilities, as legacy commercialization initiatives, are not research projects. Thus, NanoCore was not considered a project in terms of the policy regarding management of the Scientific Director’s research-related conflicts of interest.





Effective research planning and budgeting mechanisms

- Approval of the 2019-2020, 2020-2021 and five-year budgets has been provided by the Board.
- The Finance and Audit Committee reviews the approved budget against expenses and the updated five-year budget plan quarterly.

Effective internal and external communications strategies

- NMIN has had a fully developed [website](#) since June 2019.
- Researchers, HQP, end-users, industry and policymakers are engaged through active [Twitter](#) and [LinkedIn](#) accounts, regular eblasts and NMIN newsletters. NMIN has issued 24 separate communications over the past year (see Statistical Report Table 5 - *Other Refereed Contributions* for details).
- In addition, Research Leaders, Core platform administrative leads, Theme-based research accelerators and the full NMIN Administrative Centre team meet weekly every Tuesday for a one-hour teleconference. NCE Liaison B. Viens regularly attends.

Section C: Trends and Justifications

How previous feedback has been addressed

Feedback provided by the Expert Panel Review (EPR) was developed into a document titled “Recommendations from the NCE Expert Panel Review”, which contains actionable items that the Board and RMC will address, track and report on the areas for improvement identified by the NCE Steering and Selection Committees. This document was reviewed and approved by the Board on 7 May 2019. It is updated semi-annually as part of the Board Orientation Binder. It was presented to the RMC on 14 June 2019 and provides the context in which RMC recommendations to the Board are made. Both the Board and RMC are responsible for implementing the Board-approved responses to the EPR’s recommendations.

Feedback provided by the EPR was utilized in the modification of the goals reported in the Performance Management Tables.

Overview of actual versus expected NCE grant expenditures

There were no deviations in the actual versus expected NCE grant expenditures over the past fiscal year. Total expenses were \$2,619,587 of which 23% (\$609,207) was spent on Administration and 76.7% (\$2,010,380) on research and research-related networking and partnership initiatives. The Administrative expenses as a percentage of total expenses was expected to be proportionately higher in year one due to one-time start-up costs. Note that the amount of \$609,207 expended on Administration represents only 11% of the total NCE annual award for 2019-20.

Noteworthy trends

Trends will be reported in future years.

The rationale behind any new or modified goals

The goals reported in the 2018-2019 statistical reporting cycle were based on the successful NCE application. The performance targets provided in this report have been adjusted in accordance with the decreased timeline of five years, the decreased budget awarded (reduced by 27%), and the recommendations of the NCE Expert Panel. Changes have also occurred in response to the COVID-19 pandemic, reflecting the effect institutional shutdowns have had on research progress. Amendments to performance targets include:

- The total number of PDF has been decreased from 200 PDF trained over 5 years to 125 active PDF’s (headcount all years) over five years.
- The total number of graduate and co-op students has been decreased from 300 trained over 15 years to 150 active graduate, undergraduate and co-op students (headcount all years) over five years.
- The planned design and delivery of online university credit courses have been removed from the HQP Program. In its place, NMIN has developed a portfolio of nanomedicine lectures and diverse capacity-building opportunities leading to an *NMIN Advanced Trainee Experience Certificate*. To earn this *Certificate*, NMIN HQP must participate in a wide variety of self-selected NMIN-offered

learning and capacity-building programs and experiences that go beyond what would be offered for credit by a university.

- The number of Network-wide events/workshops have been decreased from three per year to two per year due to limitations on the amount of travel and time away from their laboratories that Network participants can afford.

Section D: Network-Level Performance

Overall progress at achieving the network's ultimate outcomes

Overall, by March 2020, NMIN successfully launched an NCE that is on a clear trajectory for successfully positioning Canada to accelerate its global leadership in nanomedicine innovation over the next four years. NMIN's "top 10" achievements in 2019-20 include:

1. NMIN quickly and effectively launched the Network in all five of the NCE mandate areas.
2. Strong governance and management teams and systems (policies, procedures, terms of reference) were in place by mid-June 2019.
3. Detailed Board-approved strategic and operational planning documents guided Network start-up and program launches from the outset (there was no "muddling through" phase); Board approval was secured for NMIN Bylaw No. 1, Committee Terms of Reference, Policies & Procedures, the NMIN HQP Strategic and Operational Program Plan, the EDI Framework, Communications Plan, and Partner and Stakeholder Engagement Strategy documents.
4. The first Network-wide [research workshop](#) was held in May 2019.
5. The first annual NMIN [Scientific Meeting](#) was held in September 2019.
6. A new national HQP network ([the NHN](#)) was established, connecting trainees in nanomedicine across Canada and providing unique leadership training/development opportunities.
7. Three (3) NMIN HQP were approved for Mitacs internships with industry partners.

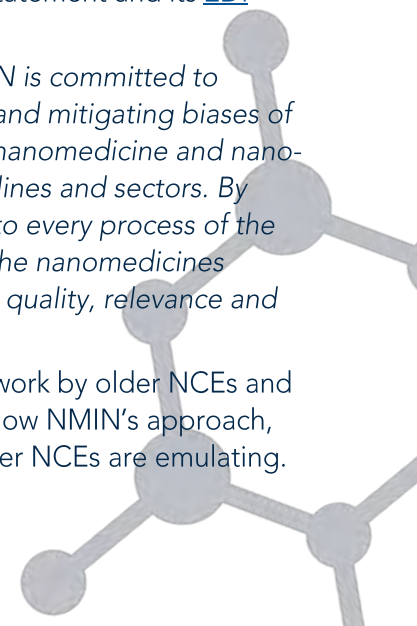
8. NMIN rapidly responded to COVID-19 by inviting projects under its existing Strategic Initiatives program; one COVID-related project review was fast-tracked, and it was [approved](#) on 31 March 2020.
9. \$1,351,558.50 in NCE research funding was issued over two adjudicated calls for applications that leveraged an additional \$1,169,467.21 of cash and in-kind funding, representing an additional \$.87 cents on every NMIN NCE dollar invested in research.
10. Network-wide, NMIN engaged 60 partners from across sectors on network projects, KTEE initiatives and HQP and capacity-building activities, as follows: 30 industry partners; 13 universities; six (6) hospitals/care centres; four (4) not-for-profits, foundations, charities or associations; two (2) federal departments or agencies; and three (3) from other sectors, for a total NCE:Non-NCE leveraging ratio for the year of \$1:\$0.69 overall.

How the network is committed to the principles of equity, diversity and inclusion

NMIN's commitment to EDI is woven directly into the policies, culture and values of this Network, and has been subject to direct discussion at every level of decision-making over the past year. See NMIN's bilingual website for its EDI policy statement and its [EDI Framework](#).

NMIN's EDI Commitment is as follows: *NMIN is committed to recognizing and reducing systemic barriers and mitigating biases of all kinds to develop an inclusive network of nanomedicine and nanomedicine-related experts from across disciplines and sectors. By integrating equity, diversity and inclusion into every process of the Network, this will exponentially strengthen the nanomedicine research and innovation community and the quality, relevance and impact of its research.*

NMIN has been consulted on its EDI Framework by older NCEs and investigators outside the field seeking to follow NMIN's approach, and thus has become an EDI leader that other NCEs are emulating.



APPENDIX 1: Performance Management Tables

TABLE 1 – PERFORMANCE AGAINST OBJECTIVES FOR FISCAL YEAR 2019-2020

	A	FY 2019-2020				
		B	C	D	E	F
Original Goal	Overall Goal	Annual Objective	Was the Annual Objective Achieved? (Y/N)	Performance Indicator / Metric	Target Outcome	Actual Outcome
GOVERNANCE AND MANAGEMENT						
Rapid and efficient Network operational launch, including Round 1 call for research proposals	Rapid and efficient Network operational launch, including launch of research program	<p>Rapid and efficient Network operational launch completed by June 2019</p> <p>Launch of research program Round 1 in April 2019</p>	Yes	<p>Board, Administrative Centre and RMC Committees fully populated</p> <p>All policies, procedures, terms of reference Board-approved</p> <p>Round 1 call for research proposals issued</p>	June 2019	<p>17 June 2019</p> <p>7 May 2019</p> <p>15 April 2019</p>
LEVERAGING NCE FUNDING						
1:1 NCE: Non-NCE research leveraging	1:1 NCE: Non-NCE research leveraging	Leverage an additional .50 cents for every NCE dollar invested in research	Yes – it was exceeded	Ratio of NMIN NCE research investment compared to Non-NCE partner investments in NMIN research projects	\$1NCE: \$0.50 Non-NCE research investment ratio	Research leveraging ratio in 2019-20 was \$1 NCE:\$0.87 Non-NCE partner investments (74% higher than Y1 target)

TABLE 1 – PERFORMANCE AGAINST OBJECTIVES FOR FISCAL YEAR 2019-2020

	A	FY 2019-2020				
		B	C	D	E	F
Original Goal	Overall Goal	Annual Objective	Was the Annual Objective Achieved? (Y/N)	Performance Indicator / Metric	Target Outcome	Actual Outcome
DEVELOPMENT OF HIGHLY QUALIFIED PERSONNEL						
200 PDF trained over 5 years	125 active PDF over five years	25 active PDF/year	No (1 active PDF less than target)	# active PDF/year	25 active PDF/year	24 active PDF
300 graduate and co-op students over 5 years	150 active graduate, co-op, and undergraduate students over five years	30 active students per year	Yes	# active students	30 active students	34 active students
New goal	45 trainees earning Advanced Education Opportunities Certificate	15 trainees per year earning Advanced Education Opportunities certification, beginning in fiscal year 2021-2022	NA – future fiscal	# Advanced Education Opportunities certification earned	15 Advanced Education Opportunities certification earned, beginning in fiscal year 2021-2022	NA – future fiscal
Ten NMIN university courses developed	Eight NMIN lecture series and webinars made available in the lecture repository	Two lecture series and two webinars made available per year, beginning in fiscal year 2020-2021	Exceeded – no webinars or lectures were planned for 2019-20	# lecture series, webinars	Two lecture series, webinars made available, beginning in fiscal year 2020-2021	Webinar offered on 18 February 2020, <i>Developing an Entrepreneurial Mindset</i>
15 workshops organized over 5 years	10 Network events organized over five years	Two cross Network events per year	Yes	# Network events	Two	Two (Research Strengthening Workshop in May 2019, First Scientific Conference September 2019)
Original goal	Pre-clinical Technology Dossiers for ten nanomedicine drugs developed, license to partners/NewCos	Two by Year 3 Four in Year 4 Four in Year 5	NA – future fiscal	# Pre-clinical Technology Dossiers for nanomedicine drugs	Two pre-clinical Technology Dossiers for nanomedicine drugs by Year 3	NA – future fiscal

TABLE 1 – PERFORMANCE AGAINST OBJECTIVES FOR FISCAL YEAR 2019-2020

	A	FY 2019-2020				
		B	C	D	E	F
Original Goal	Overall Goal	Annual Objective	Was the Annual Objective Achieved? (Y/N)	Performance Indicator / Metric	Target Outcome	Actual Outcome
RESEARCH INVESTMENTS LEADING TO KTEE, COMMERCIAL OPPORTUNITIES AND NEW ECONOMIC ACTIVITY						
Original goal	Pre-clinical Technology Dossiers for five diagnostics based on nano-technology developed, license to partners/NewCos	One by Year 3 Two in Year 4 Two in Year 5	NA – future fiscal	# Pre-clinical Technology Dossiers for diagnostics	One pre-clinical Technology Dossiers for diagnostics by Year 3	NA – future fiscal
Original goal	Execute 45 project agreements with partner companies	Five in Year 1 Ten in each subsequent year	Yes	# Project agreements with partner companies	5 project agreements with partner companies	Of the 60 organizations partnered with NMIN on network projects, 8 agreements with companies have been developed, with an additional five under negotiation at year-end
Original goal	Create ten NewCos by Year 5	Two in Year 2-3 Four in Year 3-4 Four in Year 5	NA – future fiscal	# NewCos	Two NewCos in Year 2-3	NA – future fiscal
Original goal	Create 100 new jobs by Year 5 in NewCos and partner companies	Five in Year 1 20 in Year 2-3 75 in Year 4-5	No	# new jobs in NewCos and partner companies	Five new jobs in NewCos and partner companies	3 Mitacs jobs were funded through NMIN

TABLE 1 – PERFORMANCE AGAINST OBJECTIVES FOR FISCAL YEAR 2019-2020

	A	FY 2019-2020				
		B	C	D	E	F
Original Goal	Overall Goal	Annual Objective	Was the Annual Objective Achieved? (Y/N)	Performance Indicator / Metric	Target Outcome	Actual Outcome
EQUITY, DIVERSITY AND INCLUSION LEADERSHIP						
Original goal	Increase in NMIN EDI: 10% more women or under-represented group members in university, HQP trainees, and NewCos	At least 2% increase per year	NA – baseline fiscal	At least 2% increase in 2020-21 – 2019-20 is NMIN's baseline year	At least 2% increase per year above the 2019-20 baseline (to be established)	NA – baseline fiscal
POSITIONING CANADA AS A GLOBAL LEADER						
Investing partner organizations on every project and most initiatives	A minimum of one co-investing organization on every research project	26 projects funded = target of 26 research partner organizations engaged in co-investment	Yes - Exceeded	# of funded projects: # project partnerships contributing cash and in-kind	26 research project investment partners	35 research project investment partners
Original goal	Ten new international collaborative projects initiated	One new Memorandum of Understanding and one new co-funded project per year	No	# Memorandum of Understanding # Co-funded project per year	One Memorandum of Understanding One co-funded project per year	NMIN submitted a joint training proposal under the Shastri India program but no results are yet available. Due to COVID-19, efforts towards the development of international collaborations have been delayed.

TABLE 2 – EXPECTED PERFORMANCE FOR FISCAL YEAR 2020-2021

G	FY 2020-2021		
	H	I	J
Overall Goal	Annual Objective	Performance Indicator / Metric	Target Outcome
LEVERAGING NCE FUNDING			
1:1 NCE: Non-NCE re- search leveraging	Leverage an additional Non-NCE \$1.00 for every NCE \$1.00 invested in research	Ratio of NMIN NCE research in- vestment compared to Non-NCE partner investments in NMIN re- search projects	\$1NCE: \$1 Non-NCE research investment ratio
DEVELOPMENT OF HIGHLY QUALIFIED PERSONNEL			
125 active PDF over five years	25 active PDF/year	# active PDF/year	25 active PDF/year
150 active graduate, co- op, and undergraduate students over five years	30 active students per year	# active students	30 active students
45 trainees earning Ad- vanced Education Oppor- tunities Certificate	15 trainees per year earning Advanced Education Opportunities certification, beginning in fiscal year 2021-2022	# Advanced Education Opportuni- ties certification earned	80% of all NMIN trainees take advantage of at least three Network capacity building programs per year between 2020 and 2024 towards achievement of 15 Advanced Education Opportunities Certificates earned per year, beginning in fiscal year 2021-2022
Eight NMIN lecture series and webinars made availa- ble in the lecture reposi- tory	Two lecture series and two webinars made available per year, beginning in fiscal year 2020-2021	# lecture series, webinars	Two lecture series, webinars made available in fiscal year 2020-2021
LEVERAGING THE NETWORK STRUCTURE			
10 Network events orga- nized over five years	Two cross Network events per year	# Network events	Two Network-wide events (may be modified as online events dependent upon COVID-19 regulations against physical meetings of >10 people to ensure social distancing)

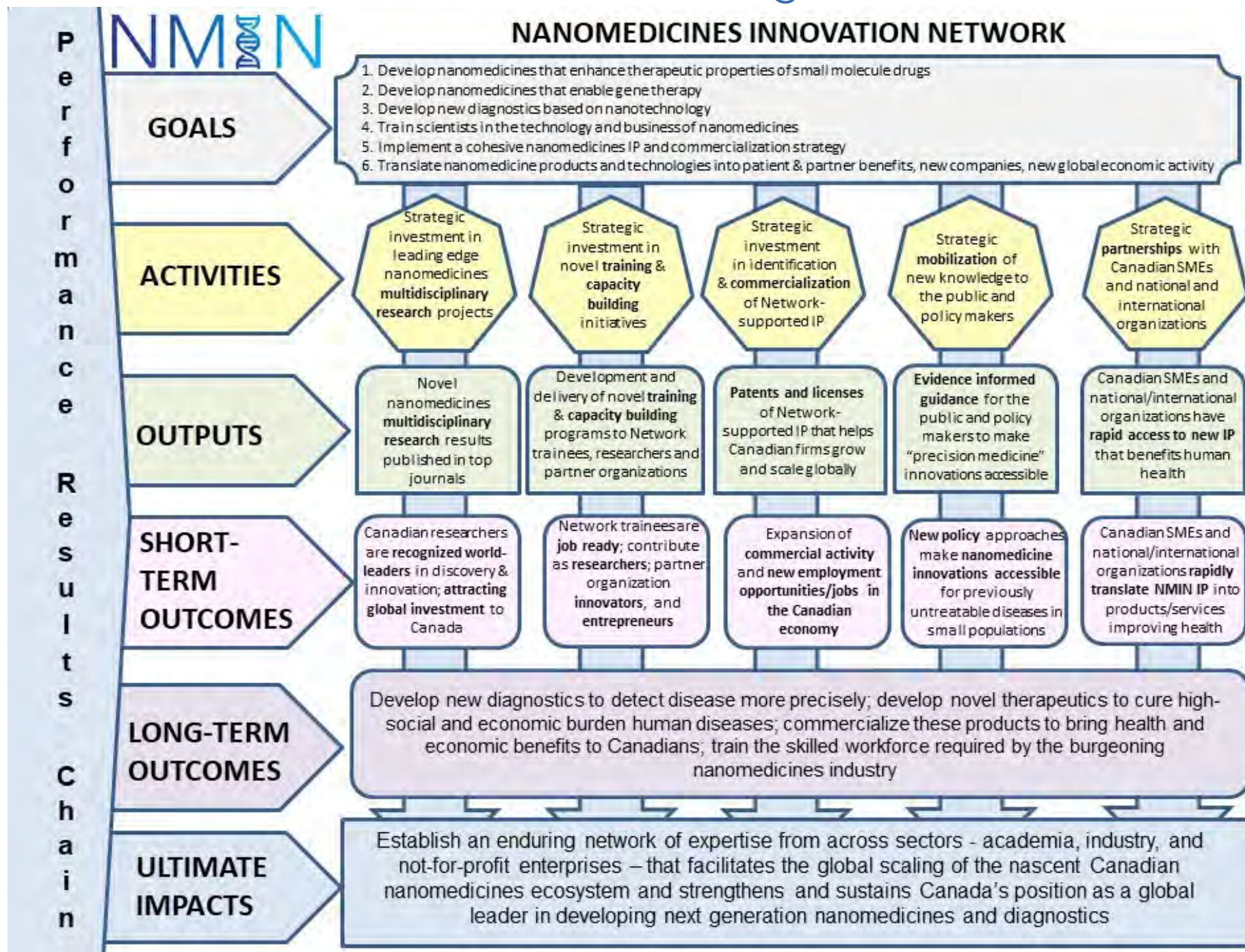
TABLE 2 – EXPECTED PERFORMANCE FOR FISCAL YEAR 2020-2021

G	FY 2020-2021		
	H	I	J
Overall Goal	Annual Objective	Performance Indicator / Metric	Target Outcome
RESEARCH INVESTMENTS LEADING TO KTEE, COMMERCIAL OPPORTUNITIES AND NEW ECONOMIC ACTIVITY			
Pre-clinical Technology Dossiers for ten nanomedicine drugs developed, license to partners/NewCos	Two by Year 3 Four in Year 4 Four in Year 5	# Pre-clinical Technology Dossiers for nanomedicine drugs	Early identification of two pre-clinical Technology Dossiers for nanomedicine drugs for confirmation in Year 3 (2021-22)
Pre-clinical Technology Dossiers for five diagnostics based on nanotechnology developed, license to partners/NewCos	One by Year 3 Two in Year 4 Two in Year 5	# Pre-clinical Technology Dossiers for diagnostics	Early identification of one pre-clinical Technology Dossier for a diagnostic by Year 3
Execute 45 project agreements with partner companies	Five in Year 1 Ten in each subsequent year	# Project agreements with partner companies	10 project agreements with partner companies, of which five are currently under negotiation
Create ten NewCos by Year 5	Two in Year 2-3 Four in Year 3-4 Four in Year 5	# NewCos	Two NewCos in Year 2-3 [one is already under development in 2020-21]
Create 100 new jobs by Year 5 in NewCos and partner companies	Five in Year 1 20 in Year 2-3 75 in Year 4-5	# new jobs in NewCos and partner companies	10 new jobs in NewCos and partner companies in 2020-21

TABLE 2 – EXPECTED PERFORMANCE FOR FISCAL YEAR 2020-2021

G	FY 2020-2021		
	H	I	J
Overall Goal	Annual Objective	Performance Indicator / Metric	Target Outcome
EQUITY, DIVERSITY AND INCLUSION LEADERSHIP			
Increase in NMIN EDI: 10% more women or under-represented group members in university, HQP trainees, and NewCos	At least 2% increase per year	At least 2% increase in 2020-21 – 2019-20 is NMIN's baseline year	At least 2% increase per year above the 2019-20 baseline
NEW Network-wide EDI Training	100% of Board, Committee members, Network investigators, trainees and Administrative Centre Staff to complete online EDI training programs in <i>Diversity and Inclusion Fundamentals</i> and <i>Unconscious Bias</i>	100% participation and completion of the two EDI programs licensed in by NMIN	100% of Board, Committee members, Network investigators, trainees and Administrative Centre Staff complete online training in <i>Diversity and Inclusion Fundamentals</i> and <i>Unconscious Bias</i> supporting NMIN's commitments to EDI in all aspects of Network decision-making and operations [license has been secured and training period is July – September 2020]
POSITIONING CANADA AS A GLOBAL LEADER			
Investing partner organizations on every project and most initiatives	A minimum of one co-investing organization on every research project	# of funded projects:# project partnerships contributing cash and in-kind	35 research project investments: 35+ research investment partners
Ten new international collaborative projects initiated	One new Memorandum of Understanding and one new co-funded project per year	# Memorandum of Understanding # Co-funded project per year	One international Memorandum of Understanding One international co-funded project [targets lowered for 2020-21 due to COVID-19 restrictions on travel]

APPENDIX 2: NMIN Logic Model



APPENDIX 3: NMIN Organizational Structure

PEOPLE

NMIN leverages the research and entrepreneurial excellence of a pan-Canadian, multidisciplinary team.

NMIN's Board of Directors (BoD) provides governance and monitors progress towards strategic goals. The BoD receives input from two Advisory Committees: Executive & Nominating Committee, and Finance & Audit Committee.

NMIN's Scientific Leadership Team consists of the Scientific Director & CEO (UBC) and the Associate Scientific Director (University of Toronto).

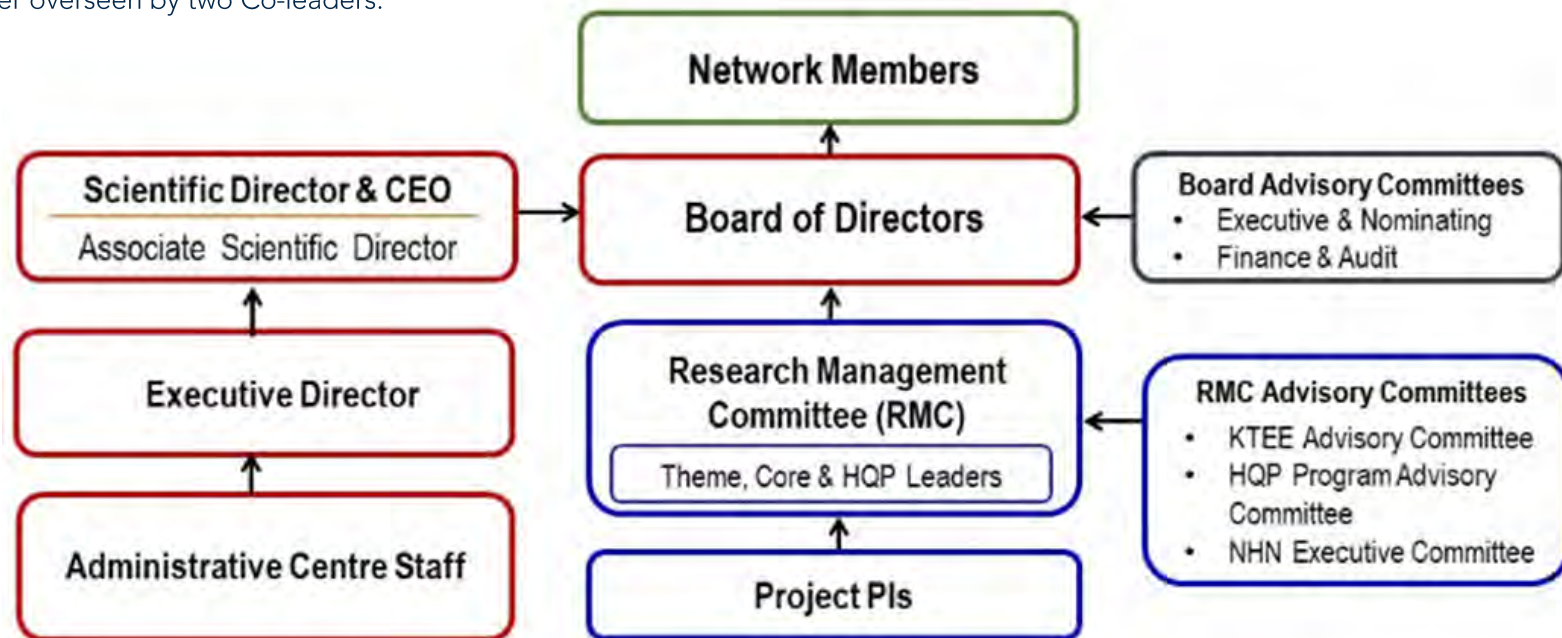
NMIN's Research Program receives oversight and strategic direction from the Research Management Committee (RMC). Half of the membership of the RMC is from outside the Network (are not funded investigators). Each of the program's three Themes and two Core Facilities are further overseen by two Co-leaders.

The RMC receives input from two Advisory Committees: the KTEE Advisory Committee and the HQP Program Advisory Committee.

The Administrative Centre Team supports the development and delivery of the Research calls and progress reporting management, the HQP Programs, and numerous KTEE initiatives. It also provides the Network's administration, operations, IP management process support, and communications including web and social media on a day-to-day basis.

The overall organizational structure of NMIN, which has been incorporated as a Federal Not-For-Profit organization, is represented in Figure I.

Figure I: NMIN Organizational Structure



GOVERNANCE

Board of Directors

NMIN's Board of Directors (BoD) provides governance and monitors progress towards strategic goals. The BoD includes 10 individuals with leadership experience in areas ranging from law, finance, entrepreneurship, scientific research to corporate management. Committees of the Board include the Executive and Nominating Committee and the Finance and Audit Committee. Members of the BoD also form ad hoc committees or special task forces as needed. Their names and experience are as follows:

- Don Enns, Chair; Vice President and Head of Global Drug Delivery, Evonik Canada, Vancouver
- Helen Burt, Associate Vice-President, Research & Innovation, The University of British Columbia, Vancouver
- Christine Charette, Board member and Finance & Audit Committee member, Scientia Advisors and Investments, Toronto
- Ka-Yee Grace Choi, NMIN HQP Network (NHN) Executive Committee President; Postdoctoral Fellow, The University of British Columbia, observer
- Michael Coughtrie, Professor and Dean, Faculty of Pharmaceutical Sciences, The University of British Columbia, Vancouver
- Pieter Cullis, Scientific Director and CEO, NMIN; Professor, Department of Biochemistry, The University of British Columbia, Vancouver
- Lesley Esford, Director, Innovate BC, Vancouver
- Vanessa Grant, Partner, Norton Rose Fulbright Canada LLP, Toronto
- Inès Holzbaur, Founder and Managing Partner, AmorChem, Montreal
- David Martin, Managing Director and Head of Equity Research, Bloom Burton & Co, Toronto
- Diana Royce, Managing Director, NMIN, observer, NMIN Administrative Centre

- Norma Sebestyen, Vice-Chair; Former Director, Corporate Affairs, Policy and Access, Sales, Health Education, Business Partnerships, Merck, Vancouver
- Brigit Viens, Deputy Director, NMIN NCE Liaison, observer, Ottawa

NETWORK MANAGEMENT

Scientific Leadership Team

NMIN's Scientific Leadership Team is comprised of the Scientific Director and Associate Scientific Director, who provide scientific leadership and overall management.

- Pieter Cullis, Scientific Director & CEO, UBC
- Gilbert Walker, Associate Scientific Director, University of Toronto

RESEARCH MANAGEMENT

Research Management Committee

With representatives from academic and industry partners, the Research Management Committee (RMC) is responsible for ongoing assessment of all projects and provides recommendations to the BoD regarding research priorities and budget allocations. Their names and institutions are as follows:

- Pieter Cullis, Chair, Scientific Director and CEO, NMIN; Theme 2: Nanomedicines for Enabling Gene Therapies Leader
- Marcel Bally, The University of British Columbia; Theme 1: Targeted Drug Delivery Leader
- Nicolas Bertrand, NMIN HQP Program Advisory Committee (HPAC) Chair, Université Laval
- Christine Charette, NMIN Board member and Finance & Audit Committee member, Toronto
- Nancy Dos Santos, PharmaCore Operational Lead, observer, BC Cancer Research Centre



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- JP Heale, Managing Director, University-Industry Liaison Office, UBC
 - Christian Kastrup, The University of British Columbia; Theme 2: Nanomedicines for Enabling Gene Therapies Co-Leader
 - Shana Kelley, University of Toronto; Theme 3: Diagnostics Leader
 - Star Li, The University of British Columbia; Theme 1: Targeted Drug Delivery Co-Leader
 - Parimal Nathwani, Vice-President, Toronto Innovation Acceleration Partners (TIAP)
 - David O'Neill, President, FACIT, Toronto
 - Mark Pereira, Theme 3 Research Accelerator, observer, Toronto
 - Sams Sadat, NHN Executive Committee Vice-President, University of Alberta
 - Brigit Viens, Deputy Director, NMIN NCE Liaison, observer, Ottawa
 - Gilbert Walker, University of Toronto, Associate Scientific Director (KTEE); Theme 3 Co-Leader
 - Kaley Wilson, Director, Business Development, Quark Venture, Vancouver
 - Dominik Witzigmann, NanoCore Operational Lead, observer, UBC

Research Theme & Core Facilities Leaders

NMIN research is organized into three themes, led by Theme Leaders: Targeted Drug Delivery, Gene Therapy, and Diagnostics, each consisting of up to 10 projects. The research themes are supported by two core facilities led by Core Leaders: NanoCore and PharmaCore.

- Marcel Bally, Theme 1: Targeted Drug Delivery Leader
- Pieter Cullis, Theme 2: Nanomedicines for Enabling Gene Therapies Leader
- Nancy Dos Santos, PharmaCore Operational Lead, observer, BC Cancer Research Centre

- Christian Kastrup, Theme 2: Nanomedicines for Enabling Gene Therapies Co-Leader
- Shana Kelley, Theme 3: Diagnostics Leader
- Star Li, Theme 1: Targeted Drug Delivery Co-Leader
- Mark Pereira, Theme 3 Research Accelerator, observer, University of Toronto
- Gilbert Walker, Theme 3 Co-Leader
- Dominik Witzigmann, NanoCore Operational Lead, observer, UBC

RMC ADVISORY COMMITTEES

HQP and Program Advisory Committee

As a standing committee reporting to the RMC, the HQP Program Advisory Committee's (HPAC) mandate is to advise RMC on training and programming opportunities that will increase the knowledge, skills and expertise of trainees and new professionals in the field of nanomedicine. Their names and institutions are as follows:

- Nicolas Bertrand, Chair, Université Laval (also cross-appointed to RMC)
- Ildiko Badea, University of Saskatchewan
- Devika Chithrani, University of Victoria
- Ka-Yee Grace Choi, President, NHN Executive Committee; UBC
- Michael Doschak, University of Alberta
- Marianna Foldvari, University of Waterloo
- Emmanuel Ho, University of Waterloo
- Andrew Martin, University of Alberta
- Naomi Matsuura, University of Toronto
- Donald Miller, University of Manitoba

NMIN HQP Network (NHN) Executive Committee

The NMIN HQP Network (NHN) is a student-led organization com-

prising NMIN research trainees and new professionals in all fields of nanomedicine related research. As a standing advisory committee to the RMC and HPAC, the mandate of the NHN Executive Committee is to enhance research and professional networking opportunities for NMIN research trainees and new professionals. Their names and institutions are as follows:

- Ka-Yee Grace Choi, Chair, The University of British Columbia
- Sams Sadat, University of Alberta
- Morgan Alford, The University of British Columbia
- Quinn Matthews, University of Toronto
- Wesley Walker, University of Toronto
- Jennyfer Zapata-Farfan, Polytechnique Montréal

ADMINISTRATIVE CENTRE TEAM

The Administrative Centre team consists of the Executive Director, the Executive Assistant, an Accountant, a Research and Partnerships Manager, an HQP & Events Coordinator, and a Digital Initiatives Consultant. This team supports and facilitates the work of the network's Governance, Management and Program teams, and is responsible for the Network's day-to-day operations.

Table A: NMIN Administrative Centre Team			
Dr.	Diana	Royce	Executive Director
Ms.	Marion	Athané	Executive Assistant
Mr.	Marshall	Beck	Digital Initiatives Consultant
Ms.	Grace	Chen	Accountant
Mrs.	Leah	Graystone	HQP and Events Coordinator
Mr.	Daniel	Rogers	Manager, Research & Partnerships

The staff details can be found on the [NMIN website](#).

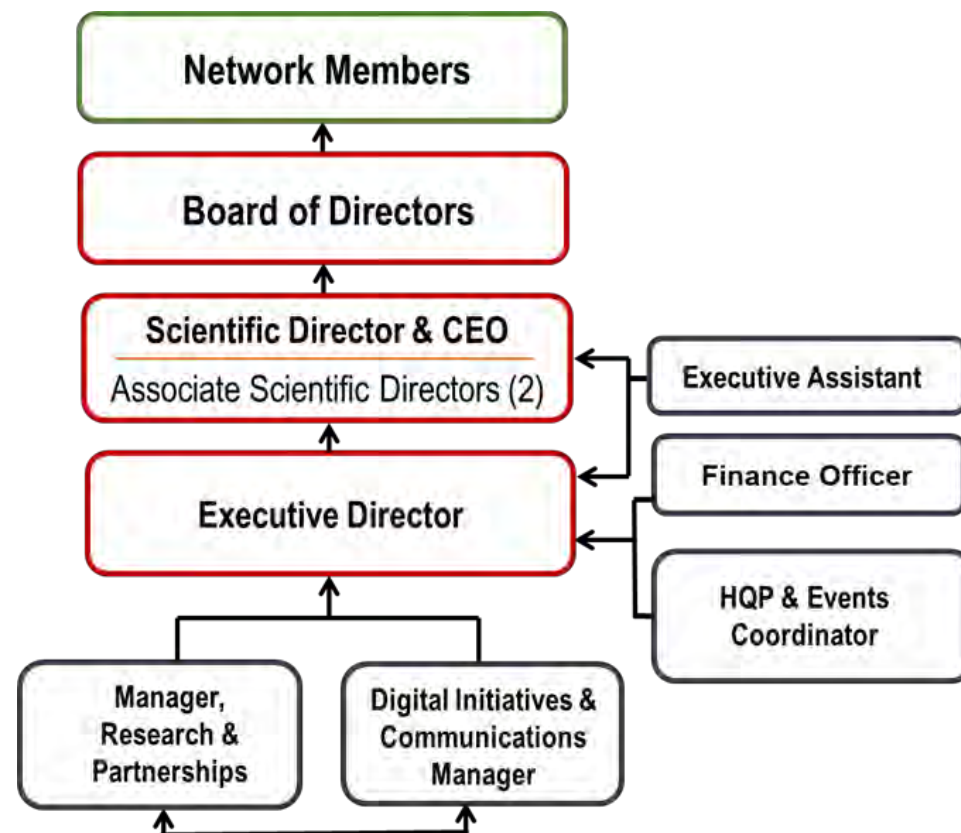


Figure II: NMIN Administrative Structure



ENDNOTES

¹The Board of Directors approved additional research funds for 2020-21 on 10 June 2020 to help mitigate the additional project costs incurred due to the shut-down of projects and laboratories to mitigate the spread of COVID-19.

²This list includes all projects funded to June 2020.

Submitted 3 July 2020



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