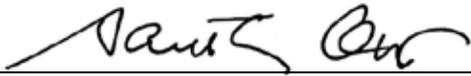| SUBJECT	RESEARCH EXCELLENCE CLUSTERS UPDATE
MEETING DATE	SEPTEMBER 12, 2019

Forwarded on the Recommendation of the President

APPROVED FOR SUBMISSION

Santa J. Ono, President and Vice-Chancellor

FOR INFORMATION

Report Date	August 20, 2019
Presented By	Gail Murphy, Vice-President Research & Innovation Andrew Szeri, Provost and Vice-President Academic, UBC Vancouver

EXECUTIVE SUMMARY

UBC's Research Excellence Clusters pilot program furthers specific strategies from *Shaping UBC's Next Century,* including enabling interdisciplinary clusters of research excellence in pursuit of societal impact (Strategy 6), improving the ecosystem that supports the translation of research into action (Strategy 9), fostering a strong and diverse research culture (Strategy 10), deepening the relevance and public impact of UBC research and education (Strategy 16), and building and sustaining strategic global networks that enhance impact (Strategy 19).

At UBC Vancouver, the Grants for Catalyzing Research Excellence Clusters (GCRC) program was jointly created by the Vice-President Research & Innovation and the Provost & Vice-President Academic, UBC Vancouver to provide support for catalytic activities that enable the development of emerging clusters of research excellence into Global Research Excellence (GREx) clusters.

To date, four GCRC competitions have been held and a total of 81 clusters, totalling $8,698,114 have been awarded.

The purpose of this report is to provide an initial analysis of the involvement of hundreds of UBC researchers across all career stages and across multiple disciplines in the UBCV Grants for Catalyzing Research Clusters (GCRC) initiative.

Attached: Report on UBC's Research Excellence Cluster Program: Cluster Composition

STRATEGIC CORE AREAS SUPPORTED

☐ People and Places   ∎ Research Excellence   ☐ Transformative Learning   ☐ Local / Global Engagement

DESCRIPTION & RATIONALE	It is now widely recognized that the solutions to the world's most pressing complex problems require researchers to collaborate across disciplines, institutions, sectors and geographic boundaries. Researchers are increasingly conducting interdisciplinary and multidisciplinary research and there is an attendant trend for federal sponsors to target large-scale funding competitions to support this type of team-based research. In response, UBC has been running pilot programs at each campus to help enable and increase interdisciplinary and team-based research efforts.
BENEFITS	The Research Excellence Cluster program is designed to help researchers form and nurture interdisciplinary teams that can be used as a basis to form partnerships and collaborations, develop new direction/themes in research creation and address key societal and cultural problems and challenges that transcend the traditional boundaries associated with departments, institutions and funding agencies.

UBC-Vancouver's Research Excellence Clusters Program: Cluster Composition

The purpose of this report is to provide an initial analysis of the involvement of UBC researchers across all career stages and across multiple disciplines in the UBC-V Grants for Catalyzing Research Clusters (GCRC) initiative. This program enables UBC researchers to pursue novel research directions, themes and questions.

Overview of the GCRC Program

UBC's Research Excellence Clusters pilot program furthers specific strategies from Shaping UBC's Next Century Plan including enabling interdisciplinary clusters of research excellence in pursuit of societal impact (Strategy 6), improving the ecosystem that supports the translation of research into action (Strategy 9), fostering a strong and diverse research culture (Strategy 10), deepening the relevance and public impact of UBC research and education (Strategy 16), and building and sustaining strategic global networks that enhance impact (Strategy 19).

On the Vancouver Campus, the GCRC program was jointly created by the Vice-President Research & Innovation (VPRI) and the Provost & Vice-President Academic (Vancouver) to provide support for catalytic activities to enable the development of emerging clusters and to foster the growth of established clusters of research excellence. The objectives of the GCRC are to help researchers form and nurture interdisciplinary teams that facilitate partnerships and collaborations, develop new questions and new directions/themes in research creation, and address key societal and cultural challenges that transcend the traditional boundaries associated with departments, institutions and funding agencies.

Faculty from all disciplines are invited to submit proposals to an open competition and funding decisions are determined through a process of rigorous peer review facilitated by the VPRI Office. At the time of submission, applicants select one of three panels to review their proposals: Health, STEM, or Social Sciences, Humanities, and Creative & Performing Arts. The three interdisciplinary review panels are composed of external experts, UBC faculty and staff and adjudications take place in person. The adjudication process adheres to best practices including the declaration of any conflicts of interest and the recusing of panel members as appropriate, and voting on consensus scores by secret ballot. All review panel discussions and ranked lists are considered confidential.

Table 1 describes the four GCRC competitions that have been held. Successful clusters have one year to spend awarded funds on non-direct costs of research, such as workshops, coordination activities and grant writing. To give a sense of the diversity of topics that have been funded, Appendix 1 provides a description of the clusters funded over the last two competition years.

Table 1 Summary of UBCV GCRC Competitions

Competition	Year	Disciplines	Applications	Awards	Total $
CFREF Task Force[1]	2016	STEM & Health (federal priorities)	108	14	$1,242,000
GCRC	2016	Social Sciences, Humanities, Creative & Performing Arts	39	11	$458,000
GCRC	2017	All Disciplines	87	29	$3,537,500
GCRC	2018	All Disciplines	84	27	$3,460,614
					$8,698,114

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[1] Initial cluster funds were awarded through an internal, peer reviewed competition that was conducted to identify proposals for the Canada First Research Excellence Fund.

The Composition of Clusters

To gain insight into the composition of membership of clusters, we consider data from the last two years for which competitions were held across all disciplines. Across the 171 applications received for these two GCRC competitions, 49 (~30%) were led by early to mid-career faculty (defined by rank as assistant or associate professor) and 54 (32%) were led by women. Of the 56 funded clusters (full list provided in Appendix 1) over the last two years, 11 (20%) were led by assistant or associate professors and 21 (38%) were led by women. The GCRC competition requires the identification of a sole lead (PI) to enable administration of funding; in reality, a cluster may be effectively led by multiple researchers, thus these numbers would be under-representing diversity in leadership.

The purpose of a cluster is to bring multiple researchers together to work collaboratively. Funded clusters typically comprise 10-100+ confirmed members, including faculty, students, staff and external collaborators. To date, our reporting methods have been limited in capturing information about participants from a diversity perspective. As part of efforts to support and improve inclusion in research, VPRI is working with Equity and Inclusion to improve data collection efforts, which will allow tracking of the diversity of involvement in GCRC funded clusters over time.
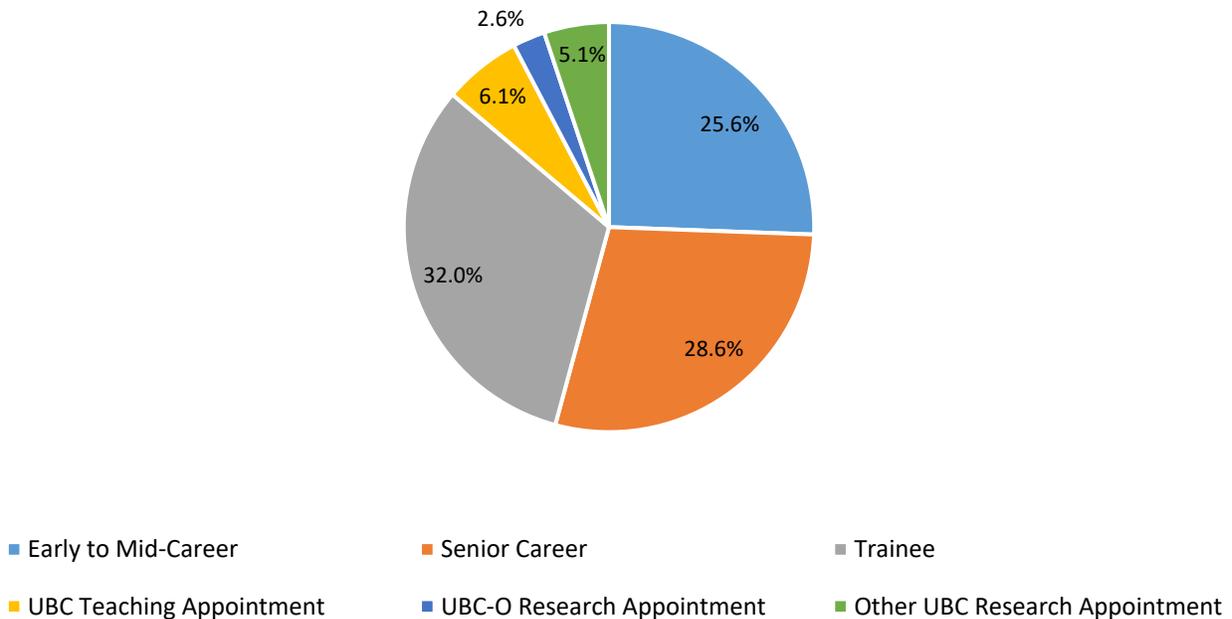
To give initial insight into diversity of membership in funded clusters, we provide an analysis of six currently funded clusters that represent a range of established and emerging clusters from the Social Sciences, Humanities, Health, STEM, and Creative and Performing. These clusters are: 1) Migration, 2) Interdisciplinary Theatre-Based Research Collective, 3) Diversified Agroecosystems, 4) Origins of Balance Deficits and Falls, 5) Biodiversity Research, 6) Language Sciences Initiative.

Table 2 shows the range of UBC participants in the six clusters with respect to career stage, gender, and campus location.

Table 2 Composition of Six Currently Funded Clusters (~400 UBC members)

Cluster Name	Type	Total UBC Members	Women	Early to Mid-Career Faculty	UBC-O
Migration	Emerging/ Humanities	11	8	6	0
Theatre	Emerging/ Performing Arts	21	12	5	1
Diversified Agro	Established/ Social Sciences STEM	23	9	6	0
Balance & Falls	Emerging/ Health	24	7	5	2
Biodiversity	Established/ STEM	140	54	26	6
Language Sciences Initiative	Established/ Social Sciences	172	110	52	5

Figure 1 shows the relative proportions of UBC cluster members' career stages across the six clusters. By encouraging participation across all career stages, the GCRC program strives to increase research excellence and innovation. Early-career faculty in particular can benefit by being co-investigators on group grants and through mentoring and interactions with more senior faculty from beyond their home department(s).

- ■ Early to Mid-Career
- ■ Senior Career
- ■ Trainee
- ■ UBC Teaching Appointment
- ■ UBC-O Research Appointment
- ■ Other UBC Research Appointment

Actions to Further Increase Inclusion

To advance UBC's overarching institutional commitment to Inclusive Excellence, equity, diversity and inclusion (EDI) considerations are being incorporated into all aspects of the GCRC program including application requirements, proposal evaluation criteria, review panel composition, and end of grant reporting. Beginning in the 2018 competition, GCRC proposals were evaluated on the extent to which they demonstrate a commitment to EDI through cluster membership and proposed activities. In April 2019, the 27 currently funded clusters were invited to a half-day session dedicated to EDI in research. Building on these efforts, for the 2019 competition, the VPRI has developed a "Resource Guide for Addressing EDI in GCRC Applications" (Appendix 2) and is collaborating with UBC's Office of Equity and Inclusion to provide an EDI focused workshop for GCRC applicants and a separate workshop for reviewers. In recruiting GCRC reviewers, the VPRI will seek representation from a diverse range of identities including faculty from historically, systematically and persistently marginalized groups as well as faculty and staff with EDI content expertise. Attention to Inclusive Excellence in the GCRC program leads to a better research environment and culture, and provides UBC researchers experience with criteria that are playing an increasingly important role in the awarding of federal tri-council funding.

Appendix 1. Funded Clusters over the Last Two Competition Years (2018 & 2017)

Cluster Name	Description/Goals	Year(s)	Category
Advanced Materials Manufacturing	Making tomorrow's complex products safer, stronger and more sustainable using digital manufacturing and advanced simulations of materials.	2018 2017	Established Established
BC Diabetes Research Network	Strengthening diabetes research in BC from the lab bench to clinical trial across themes from cure-oriented diabetes research to diabetes prevention to diabetes complications.	2018 2017	Established Emerging
BCREGMED	Cellular and regenerative therapies through collaborative, innovative science.	2018 2017	Established Established
Biodiversity Research: An Emerging Global Research Priority	Identifying global change impacts on biodiversity and offering solutions to challenges associated with these changes.	2018 2017	Established Established
Designing for People (DFP)	Multidisciplinary approaches to human-centered research and design of interactive technologies	2018 2017	Established Established
Diversified Agroecosystems Cluster	Applying ecological and systems analysis perspectives for integrated research on sustainable food systems that can feed the world while cooling the planet, protecting biodiversity, and promoting food sovereignty.	2018 2017	Established Emerging
Gynecologic Cancer Initiative	Accelerating transformative research and translational practice on prevention, detection, treatment, and survivorship of reproductive cancers to reduce the incidence and mortality of these cancers by 50% in the next 15 years.	2018	Established
Language Sciences Initiative	Facilitating collaborations that advance our understanding of how language shapes our individual and collective human experience.	2018 2017	Established Established
Airway Centre	Addressing the growing burden of COPD and other airway conditions in BC and elsewhere by finding better diagnostics and therapies for patients.	2018 2017	Established Established
Wingspan: Dis/ability Arts, Culture & Public Pedagogy	Using public pedagogies to ask: What do inclusion and accessibility mean to our schools and the dis/Deaf artists and the students who collaborate with them? What and how we can learn from the voices of students and artists with disabilities?	2018 2017	Established Emerging
Action on Sepsis	Delivering cutting-edge innovation in the prevention, diagnosis, and treatment of sepsis in British Columbia and around the world.	2018	Emerging
Bee Health	Exploring the honey bee's role as pollinator, producer, and biomonitor and how it is impacted by environmental exposures (both natural and human caused), with the common goal of improving the fate of the honey bee.	2018	Emerging
Big Data and Computational Social Science Research Cluster	Strengthening the research community working in this area by developing synergies and infrastructure to advance this scholarly field.	2018	Emerging
Biomedical Imaging and Artificial Intelligence	Developing a deeper understanding of how molecular, cellular and tissue structure and organization relate to normal and diseased tissue function to help alleviate pressures on healthcare	2018 2017	Emerging Emerging

Cluster Name	Description/Goals	Year(s)	Category
	systems by enabling effective personalized medicine.		
Bionics Network	Engaging with patients and industry specialists to generate assistive and medical products that offer measurable improvements in quality of life.	2018 2017	Emerging Emerging
Blockchain at UBC	Addressing some of the most significant challenges facing this rapidly emerging technology, including security, scalability, and records lifecycle management.	2018 2017	Emerging Emerging
Critical+Creative Social Justice Studies-The Global Condition Working Group	Using an anti-colonial and intersectional approach to develop a transformative approach that attends to current social and ecological conditions.	2018 2017	Emerging Emerging
Dynamic Brain Circuits in Health and Disease Research Excellence Cluster	Studying brain connections, including their dynamic changes during normal development and learning and how these connections become dysfunctional in neuropsychiatric disease.	2018 2017	Emerging Emerging
Harnessing the Social Exposome to Reduce Inequalities in Child Health and Development in Canada	Determining how children's social environments influence their physical and psychological exposures to impact their health and development.	2018	Emerging
Marine Systems Research Cluster	Reducing the environmental footprint and increasing the safety and situational awareness of both merchant and naval ships.	2018	Emerging
Migration	Examining the determinants and consequences of international migration with a focus on the legal governance of migration and refugee flows, immigrant and refugee integration, the nexus between migration and Indigeneity, and the relationship between immigration and national identity.	2018 2017	Emerging Emerging
Origins of Balance Deficits and Falls	Advnacing our understanding of the mechanistic principles of healthy balance control and the mechanisms that underlie balance deficits and falls.	2018 2017	Emerging Emerging
Interdisciplinary Histories Research Cluster	Exploring both the forms of representation of the past, and their uses: how the past is excavated (literally and metaphorically) and expressed in relation to contemporary practices and concerns.	2018	Emerging
Quantum Computing Research Cluster	Discovering and creating the technology on which quantum computations will be run in the next two decades.	2018	Emerging
Transformative Health and Justice Research Cluster	Addressing the 'criminocentric' understanding of crime, rehabilitation, and recidivism, by creating a research and policy agenda to address health and justice inequities experienced by individuals impacted by the criminal justice system.	2018	Emerging
UBC Interdisciplinary Research-Based Theatre Collaborative	Employing creative means of knowledge exchange with stakeholders, communities, and other researchers.	2018 2017	Emerging Emerging
Women's Health Research Cluster	Providing the research and clinical communities with invaluable information that will make help make women healthier.	2018	Emerging

Cluster Name	Description/Goals	Year(s)	Category
Bioproducts Research Cluster	Accelerating the extraction of high value products like bio-materials, bio-energy and bio-chemicals from bio-based resources	2017	Established
Data Analytics and Systems Science (DASS) to Optimize Heart + Lung Health	Creating a system-wide, data-driven solution to harness the power of "omics" biomarkers in optimizing health and minimizing disease, and enhancing personalized diagnostic and therapeutic development for heart and lung diseases	2017	Established
ForLives: Forests and Livelihoods for Sustainable Development	Support of our vision of a world where local, forest-led sustainable development drives human prosperity in a manner which sustains and protects forests	2017	Established
Microbiome Research Network: Exploring Microbial Interactions and Microbiome Function	Changing our understanding of the role of microbial communities in health, environmental balance, and parallels between them.	2017	Established
Educational Neuroscience	Fusing neuroscience and child learning research into one novel discipline: educational neuroscience to improve the educational experiences of children in BC and beyond	2017	Emerging
Global Challenges to Democracy: Rights, Freedoms, and Self-Determination	Reimagining more inclusive democracies and global institutions that enhance human rights and indigenous self-determination, and working towards overcoming the global challenges to democracy.	2017	Emerging
Hidden Costs of Global Supply Chains (HCGSC)	Engaging communities, mobilizing new knowledge, and facilitating policy response to the social and environmental impacts of global supply chains	2017	Emerging
Indigenous/Science	Applying expertise in isotope and trace element geochemistry, spectroscopy, and archaeology to Indigenous-led research questions with practical implications for Indigenous communities.	2017	Emerging
Pain Research Network	Identifying better approaches for the management of pain in Canada	2017	Emerging
Physical Activity for Precision Health	Transforming how physical activities are prescribed, monitored, and implemented to promote health and wellbeing across the health continuum and lifespan	2017	Emerging
Re-Imagine Aging	Informing the development of a healthy aging strategy for BC and providing input into Canada's national senior's strategy.	2017	Emerging
Reimbursement and Pricing Policy for Drugs for Rare Diseases	Exploring orphan drug reimbursement policies around the world with the goal of informing the development of better informed decision-making processes for Canada	2017	Emerging
Rhythm Research Cluster	Investigating questions fundamental to our understanding of musical rhythm and rhythmic play	2017	Emerging
SmarT Innovations for Technology Connected Health (STITCH)	Creating and investigating advanced wearable devices that collect personalized information about our bodies and physical environments to expand geography of care and improve outcomes..	2017	Emerging
Systematically Identifying, Evaluating, and Responding to	Systematically identifying environmental injustices in Canada: patterns of pollution and other environmental hazards that fall disproportionately	2017	Emerging

Cluster Name	Description/Goals	Year(s)	Category
Environmental Injustices in Canada	and unfairly on the shoulders of economically or socially vulnerable communities.		
The Frail Young: Care for children with complex illnesses, their families and communities	Creating a new, national research agenda and interdisciplinary research teams to support excellent care for frail children and their families	2017	Emerging

Appendix 2. Draft Guide for Addressing EDI in GCRC Applications

DRAFT – Not for Distribution

Applicants to the **2019 Grants for Catalyzing Research Clusters (GCRC) competition** are required to "*describe the cluster's commitment to equity, diversity, inclusion as it applies to cluster membership, proposed activities and research themes.*" EDI is a fundamental component of the GCRC application and applicants should incorporate EDI considerations *throughout* their proposals. Proposals will be evaluated on how well they address and incorporate EDI considerations.

Below are suggestions to help clusters begin addressing EDI within their GCRC applications:

Cluster Leadership and Team Composition:

Clusters should reflect upon the composition of their teams with respect to the representation of individuals with diverse identities. While clusters should pay particular attention to the representation of members from the four federally designated employment equity groups (women, Indigenous Peoples, visible minorities/racialized groups, and persons with disabilities), they are encouraged to think broadly about diversity to incorporate a range of self-identities, for instance, people of different ages, career stages, gender identities, sexual orientations, ethno-cultural backgrounds, and countries of origins. Applicants should consider their process for identifying, recruiting and selecting team members and where diversity is lacking, describe strategies for ensuring greater diversity such as targeted outreach or recruitment plans. Applicants should also examine how EDI is incorporated into their plans for cluster leadership and organization to ensure that diverse team members have access to leadership opportunities and resources, and are able to fully participate in and contribute to the direction of cluster activities. In doing so, clusters are encouraged to reflect upon the existence of any barriers or obstacles that may prevent or inhibit the meaningful engagement of certain groups and describe appropriate mechanisms to address them.

Cluster Activities:

Advancing EDI is a shared responsibility. Clusters should consider strategies for developing their team's diversity competencies and inclusion skills to help ensure that EDI is guiding and being incorporated into their activities. To help build EDI capacity, clusters are encouraged to begin by reviewing and exploring EDI focused resources, training and events available at UBC through faculties/departments and units such as the Equity and Inclusion Office, the Indigenous Research Support Initiative, the Learning Exchange, and the Community Engagement Office. Clusters are also encouraged to look beyond UBC to explore the wealth of online resources developed by Canadian universities and funding agencies such as:

- CRC Equity, Diversity, and Inclusion: Best Practices for Recruitment, Hiring and Retention
- WWEST Gender Diversity 101 White Papers
- Gender Summit Report: Toward a New Normal
- SFU Library EDI Resource Guide
- Unconscious Bias – Additional Resources (Status of Women Canada)

EDI considerations should inform the design of the proposed cluster activities (e.g. cluster building, knowledge exchange events, training/mentorship) to ensure that team members/collaborators/partners have equal opportunities and access to resources and feel they belong, are supported and integrated into the team. Strategies for ensuring inclusion and equitable treatment will vary depending on the nature of the proposed activities. Below are provided as examples:

- Targeted leadership or professional development opportunities for graduate students or early career researchers from underrepresented groups;
- Following best practices in inclusive and accessible event planning when organizing knowledge exchange events for public audiences;
- Address scheduling barriers by eliminating team meetings/events before 9 am and after 4 pm to allow for the full participation of team members with childcare/family responsibilities

Depending on their proposed activities, clusters may also find it useful to consult with Associate Deans of Equity, the Senior Advisor to the Provost on Racialized Faculty, the Senior Advisor to the Provost on Women Faculty, and/or the Senior Advisor to the President on Indigenous Affairs.

Research Themes:

A growing body of literature demonstrates that considering diversity has the potential to make research more rigorous, ethically sound and societally relevant. It is therefore recommended that clusters consider whether and how EDI considerations are relevant to their research. In doing so, clusters may find it helpful to review the following online resources:

- Gender-based analysis plus (GBA+)
  - What is GBA+ (Status of Women Canada)
  - Introduction to GBA+ Online Course (Status of Women Canada)
- Sex and gender-based analysis plus (SGBA+)
  - Gender Innovations in Science, Health & medicine, Engineering and Environment (Stanford University)
  - How to integrate sex and gender into research (CIHR)
- Intersectionality
  - Intersectionality-informed Qualitative Research: A Primer (The Institute for Intersectionality Research & Policy, SFU)
  - Intersectionality-informed Quantitative Research: A Primer (The Institute for Intersectionality Research & Policy, SFU)
- Indigenous Research
  - http://www.pre.ethics.gc.ca/eng/policy-politique/initiatives/tcps2-eptc2/chapter9-chapitre9/
  - CIHR Guidelines for Health Research Involving Aboriginal People
  - United Nations Declaration on the Rights of Indigenous People