



# Research and Innovation: Strategy Snapshot

November 26, 2018

Dr. Gail Murphy, Vice-President Research and Innovation

This presentation was given at the Learning & Research Committee of the UBC Board of Governors. It provides a snapshot of current priorities in the VP Research & Innovation portfolio.

# Research and Innovation



## Outcomes

Products

Services

Companies

Policies

Practices

Health outcomes

Public debate

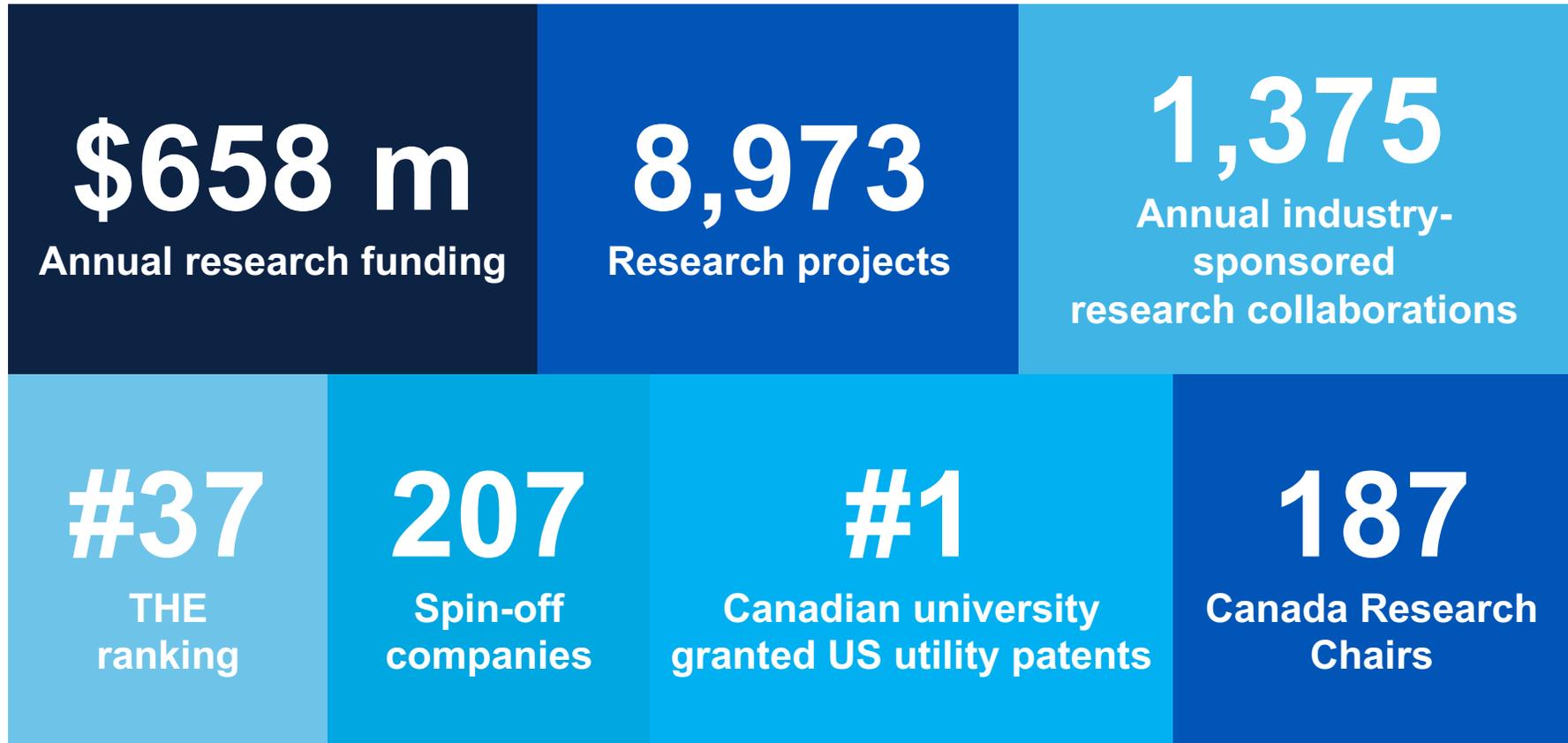
UBC  
Research

## Innovation Pathways

- Commercialization
- Entrepreneurship
- Partnerships
- Knowledge exchange

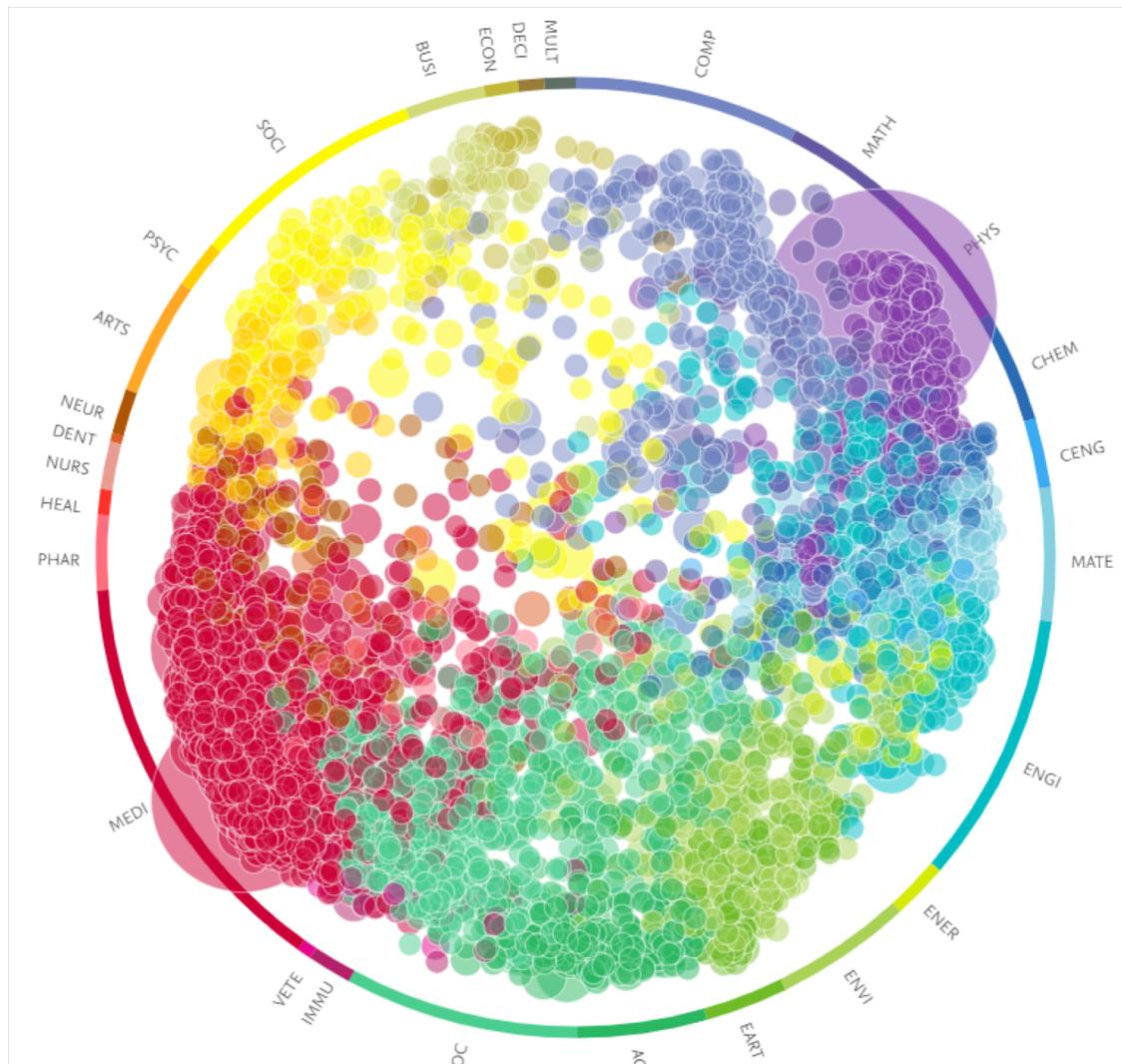
UBC research creates new works of art, provides new insights into literature and historical events, develops new technologies and enables new approaches to health and wellness, to name just a few areas in which UBC research impacts the world. For many fields, common outcomes are scholarly books, scholarly publications and lectures. Other outcomes include public debate, policies, practices, products and services. Over the last two years, UBC has been providing additional support for more kinds of outcomes through support for four innovation pathways: knowledge exchange, partnership development, entrepreneurship and commercialization,

# Research and Innovation Depth



UBC researchers from across the humanities, the creative and performing arts and the natural, life, health and social sciences influence all aspects of our lives by tackling critical questions about diverse topics such as the beginnings of the universe, the role of religion in human existence, how stem cells can be used to treat diabetes, how to enable computers to learn and how art can enhance ecological efforts. Capturing and describing the breadth of UBC research is challenging. These facts and figures provide a glimpse into the size of UBC research.

# Research and Innovation Depth



UBC areas of top 10% global research prominence (SciVal)

COMP	Computer Science
MATH	Mathematics
PHYS	Physics and Astronomy
CHEM	Chemistry
CENG	Chemical Engineering
MATE	Materials Science
ENGI	Engineering
ENER	Energy
ENVI	Environmental Science
EART	Earth and Planetary Sciences
AGRI	Agricultural and Biological Sciences
BIOC	Biochemistry, Genetics and Molecular Biology
IMMU	Immunology and Microbiology
VETE	Veterinary
MEDI	Medicine
PHAR	Pharmacology, Toxicology and Pharmaceutics
HEAL	Health Professions
NURS	Nursing
DENT	Dentistry
NEUR	Neuroscience
ARTS	Arts and Humanities
PSYC	Psychology
SOCI	Social Sciences
BUSI	Business, Management and Accounting
ECON	Economics, Econometrics and Finance
DECI	Decision Sciences
MULT	Multidisciplinary

As one glimpse into how many different areas UBC research is excellent, this visualization shows areas that appears in the top 10% of global research outputs where the outputs are scientific publications. The more colours that appear, the more areas of global strength. This SciVal data does not show areas of strength that publish in other kinds of venues, produce works of art, publish books, etc.

# Numerous Research Differentiators



There are a number of programs and aspects of UBC's research environment that differentiate UBC from peer institutions.

# Numerous Research Differentiators



## *GREx/Research Excellence Clusters*

Global leaders  
Sustained translational activities  
Strong societal impact  
Sustained funding model

GREx  
SBQMI

Global recognition  
Some translational activities  
Strong academic impact  
Significant group funding

Established Clusters

*e.g. Bioproducts, Language Sciences,  
Biodiversity, Advanced Manufacturing*

Emerging leaders  
Defined pathway to impact  
Evidence of collaborations  
History of group funding

Emerging Clusters

*e.g. Biomedical Imaging and Artificial Intelligence,  
Educational Neuroscience, Global Challenges to  
Democracy, Migration, Re-imagine Ageing, Blockchain*



## UBCO: Eminence cluster program funds 5 clusters

Both campuses have been piloting programs to help researchers form cross-disciplinary teams to solve societal challenges or develop new research directions. Proposals made by faculty are peer-reviewed to select clusters for funding. On the UBC Vancouver campus, an assessment of the program will be conducted in the spring of 2019.

# Numerous Research Differentiators



## *Indigenous Research Support Initiative*

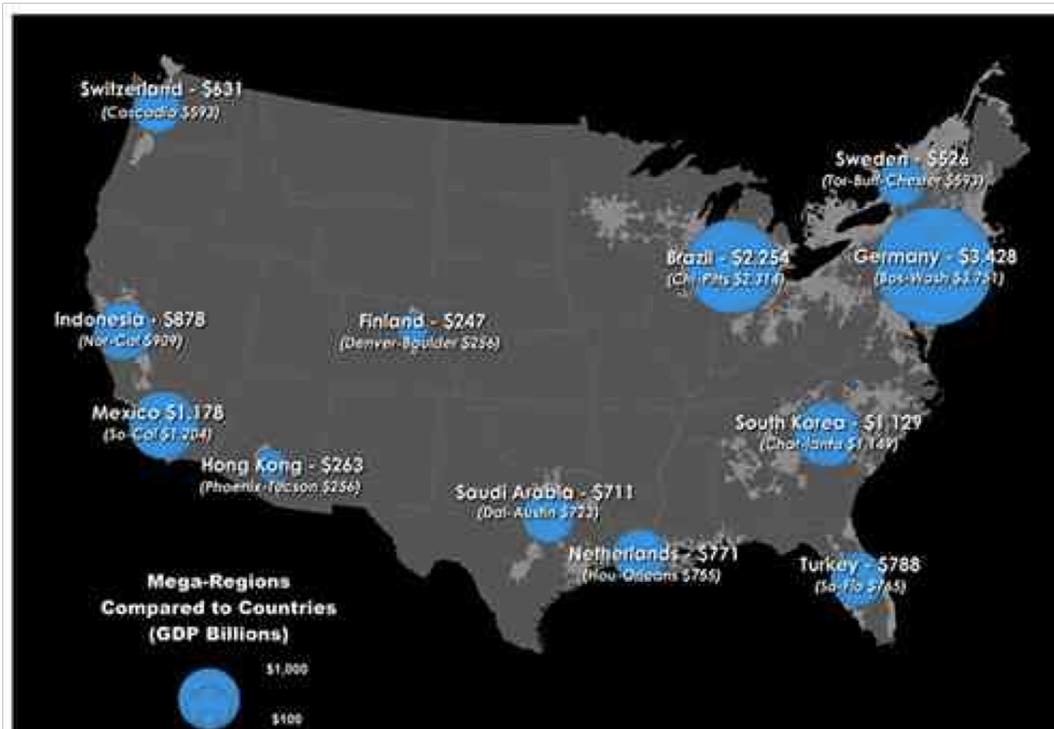
- Established in 2017
- Enable collaborative research based on community-led interests and grounded in principles of reciprocal accountability
- System wide; tailored support for each campus

The Indigenous Research Support Initiative is a pilot program to help enable and support community-engaged research with Indigenous communities.

# Numerous Research Differentiators



## *Digital Technology Supercluster/Cascadia*



Cascadia - \$593B  
within top 25  
countries in the  
world

Canada's Digital Technology Supercluster is one of five innovation superclusters funded by the federal government in 2018. UBC is a founding member of this supercluster, providing opportunities for applied research and capacity building projects.

# Research Funding

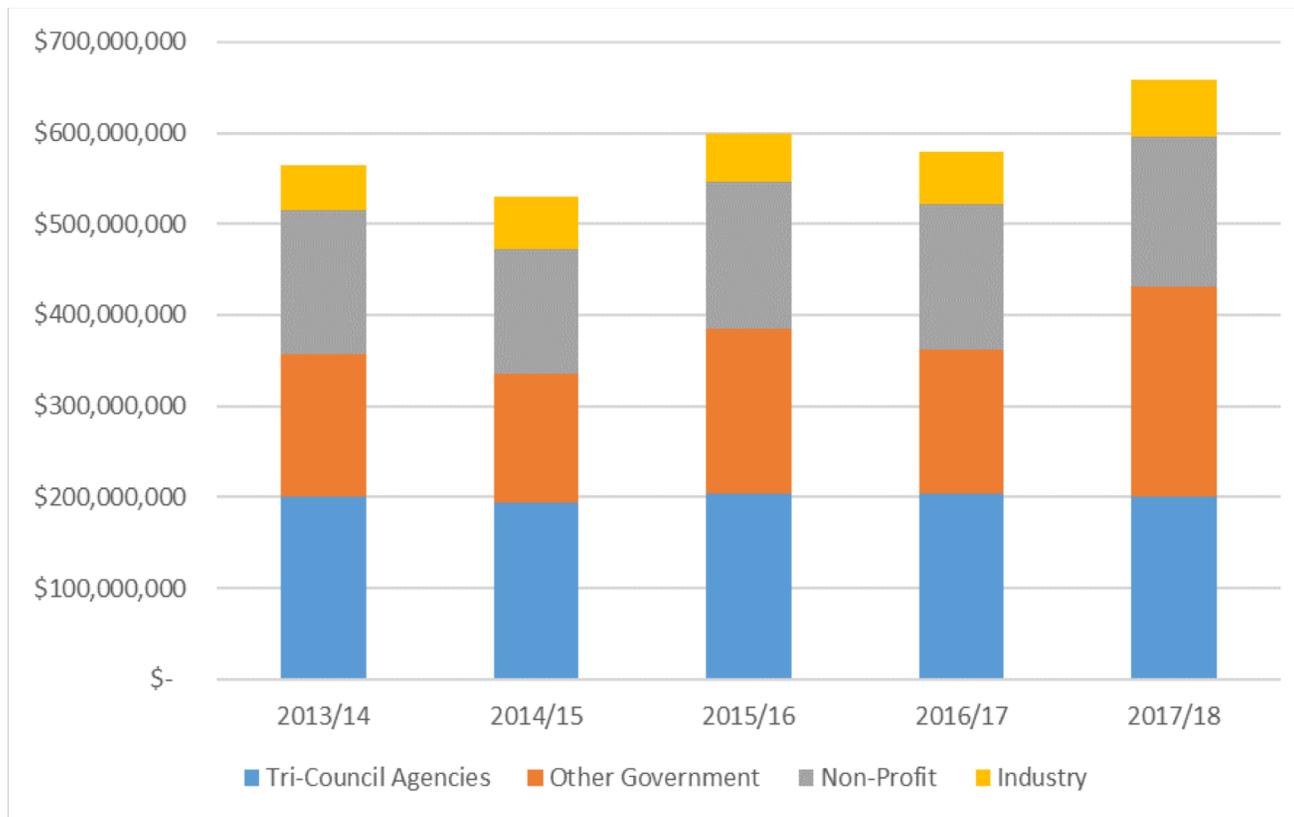


Many forms of research require funding sources. UBC researchers attract funding from many different sources, but there are challenges in ensuring sufficient funding for the projects researchers desire to undertake.

# Research Funding: Overview



**2017/18 research funding: \$658m**



## Recent successes

Canada 150 (1<sup>st</sup> nationally)

CERC (1<sup>st</sup> (tie) nationally)

Most Genome Canada  
LSARP awarded nationally

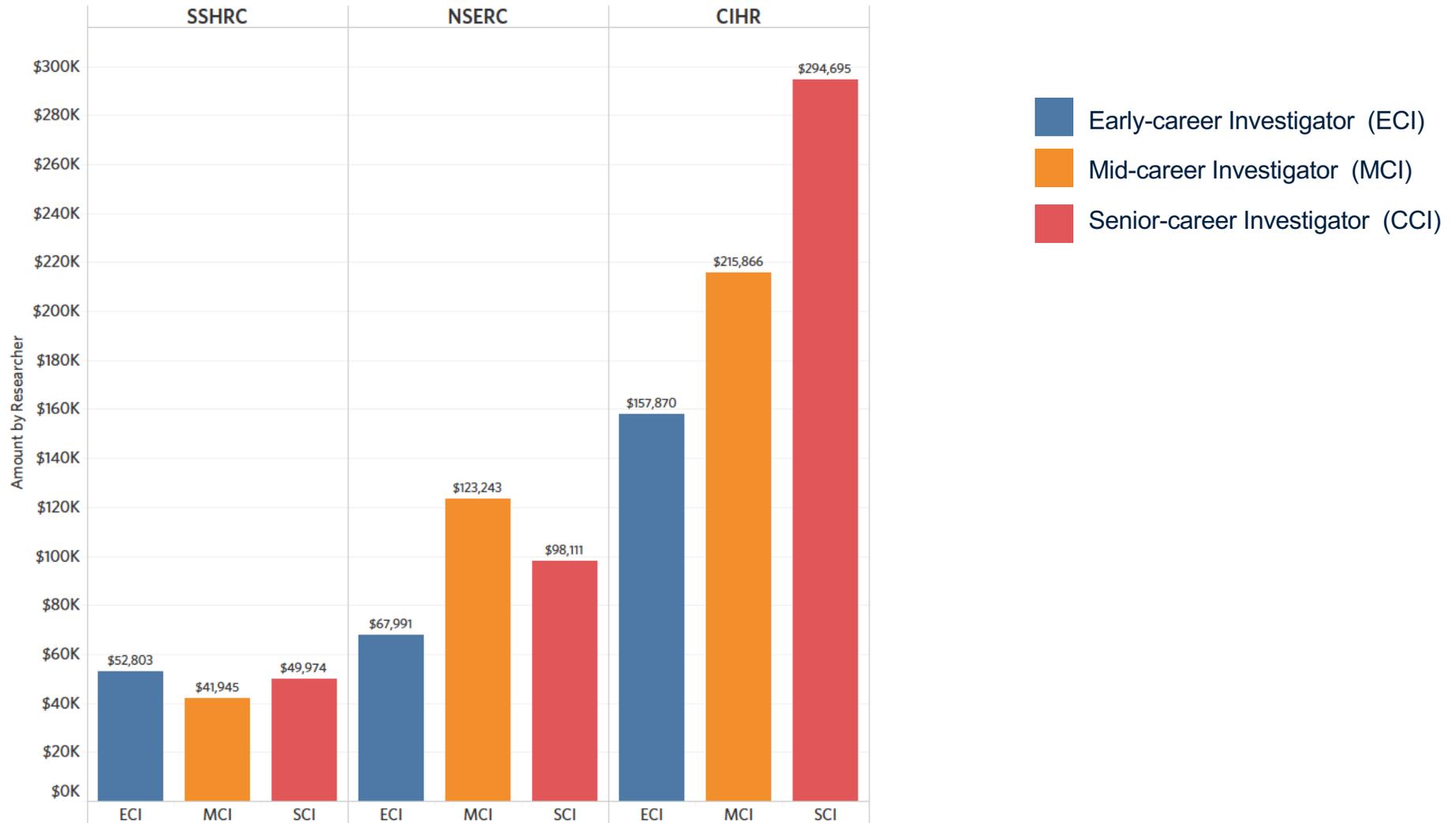
47% success rate in  
2017 CFI Innovation  
Fund competition

UBC has had significant success in many recent federal competitions. The over \$650M of funding attracted by UBC researchers in 2017/18 includes \$200M from the federal tri-council agencies, just over \$200M from other government sources, just under \$200M from non-profits and \$60M from industry.

# Research Funding: e.g., Career Stage



Amount of Funding by Researcher by Tri-Council Agency  
FY2017/18

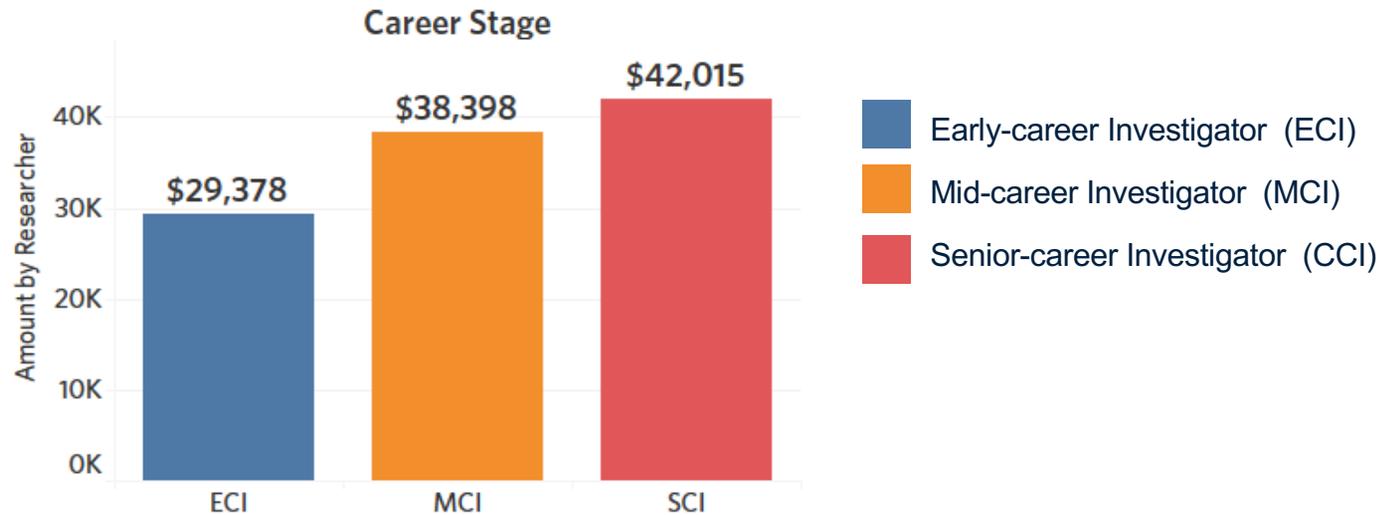


Given UBC's commitment to equity, diversity and inclusion, the VPRI office has been analyzing the funding distributions from federal sources from multiple viewpoints. One viewpoint is the stage of career of an individual.

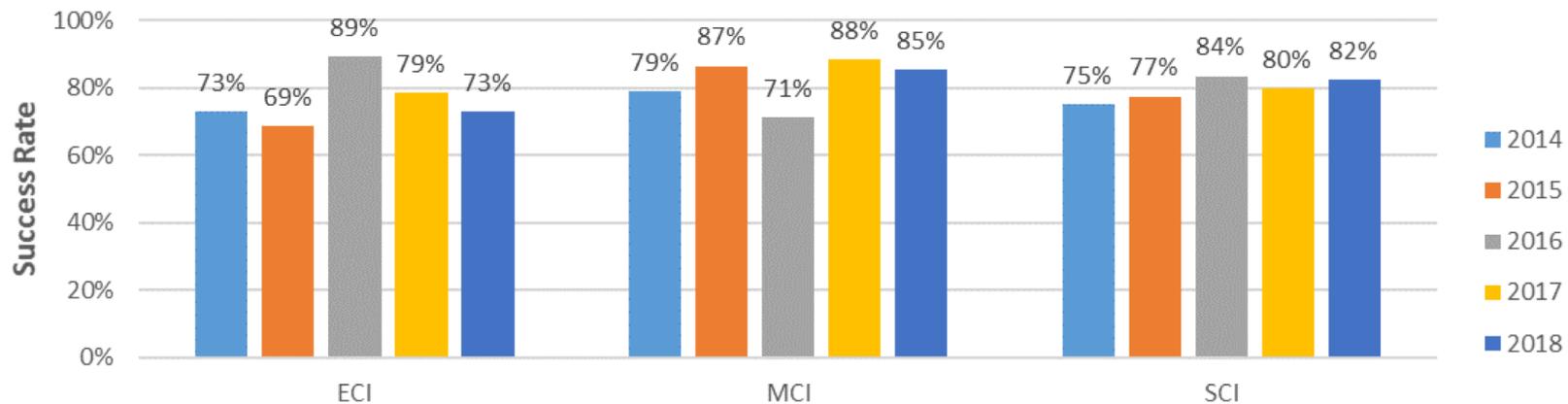
# Research Funding: e.g., Career Stage



**Average NSERC Discovery Grant - Individual by Researcher**  
FY2017/18



**NSERC Discovery Grant - Individual Success Rate by Career Stage**



This analysis for NSERC shows that there is modest growth in the average NSERC Discovery grant depending on stage of career.

# Research Funding: Gender Equity Analysis



## Research Funding by Sector for FY2015/16

Sector	Research Funding			# of Projects			Total Research Funding
	Women	Men	M/F Ratio	Women	Men	M/F Ratio	
Government (Other agencies)	\$ 44M	\$ 137M	3.1	455	1,265	2.8	\$ 181M
Government (Tri-Council)	\$ 50M	\$ 153M	3.1	881	2,213	2.5	\$ 203M
Industry	\$ 9M	\$ 44M	4.9	247	1,095	4.4	\$ 53M
Non-Profit	\$ 31M	\$ 131M	4.2	811	1,799	2.2	\$ 162M
<b>Grand Total</b>	<b>\$ 134M</b>	<b>\$ 465M</b>	<b>3.5</b>	<b>2,394</b>	<b>6,372</b>	<b>2.7</b>	<b>\$ 600M</b>

**Table 6. Overall Research Funding by Sector by Gender for FY2015/16.**

For reference, the M/F ratio for UBC faculty is 1.78 as per HRMS.

**Early** analysis of distribution of federal funding by gender suggests additional, detailed analysis is needed.

# Research & Innovation Environment



To help better support UBC researchers, a number of initiatives are underway from the VPRI portfolio.

# Research & Innovation Environment



## *Shared Infrastructure Initiative*

- Digital Research Infrastructure
  - system-wide access to local installation to bridge gap to national capacity
- Shared Facilities
  - shared governance and pooling of equipment
- Research Facility Support Grant Competition
  - prolong life of critical facilities

Researchers face challenges in keeping specialized infrastructure (equipment) operational due to costs for service, upgrades and specialized personnel. To help keep equipment operational longer, programs are being developed, such as sustainable models for shared facilities (e.g., Sequencing and Bioinformatics Consortium) and a grant competition to alleviate costs of equipment used by multiple researchers. To meet gaps in nationally available computation and storage platforms, a local installation is underway.

# Research & Innovation Environment



## *UBC Okanagan Aspire Fund*

- Supplements one-time start-up funding provided by the Faculties to new professorial recruits
- Ensures best applicants are provided with the resources required to develop a robust research career at UBC Okanagan
- Match for start-up amounts offered to research-stream recruitment candidates

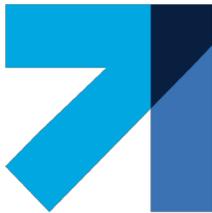
As a newer campus, UBC Okanagan has many early career researchers. Programs have been focused on ensuring these new researchers can start a successful research program at UBC quickly.

# Research & Innovation Environment



## *Innovation Hubs*

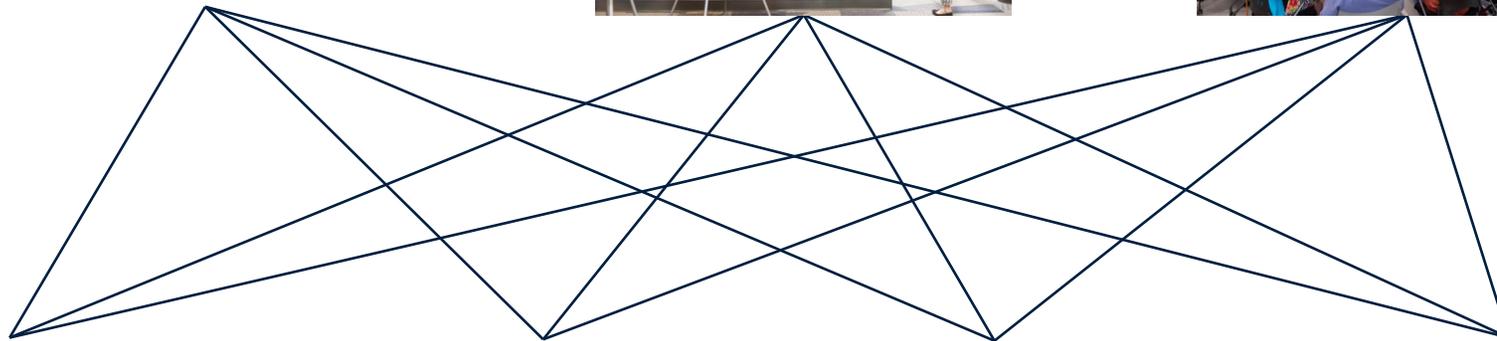
Point Grey



Robson Square  
(Spring 2018)



Kelowna  
(Fall 2018)



Entrepreneurship

Commercialization

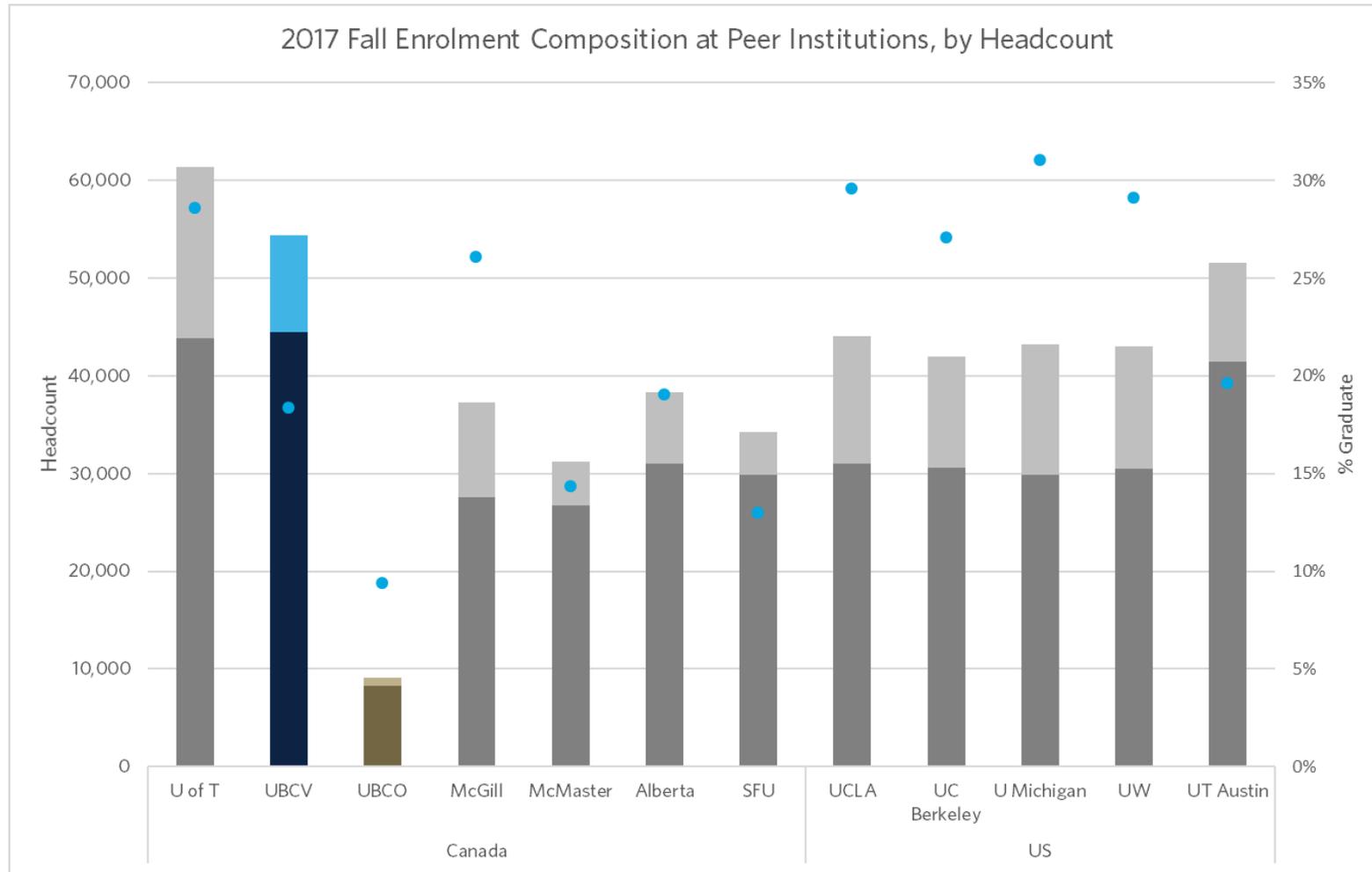
Innovation Development

Knowledge Exchange

To better support multiple forms of innovation (where research and ideas lead to social, economic and environmental impacts), including knowledge exchange and partnership development, UBC has established innovation Hubs at Robson Square (downtown Vancouver) and the Okanagan Accelerator Center (downtown Kelowna). These hubs provide a means for UBC researchers to access innovation support and for external partners to access UBC research.

# Research & Innovation Environment

## *Grad student and post-doc numbers*



Comparing graduate student and post-doctoral fellow numbers between institutions is difficult given the structure of institutions into multiple campuses and locations, including hospitals. Some data indicates UBC may have fewer relative numbers of graduate students and post-doctoral fellows compared to peer institutions.

# Snapshot Summary



# Snapshot Summary



- **Significant strength**  
all-time high research funding, strong faculty awards, world-leading companies, research impacting global policies, etc.
- **Differentiating approaches and opportunities**  
leading in interdisciplinary research, spreading practices for community-based research, broad approach to innovation, etc.
- **Challenges**  
supporting areas of strength that don't fit research cluster program (e.g., humanities), limited governmental funding, expanding cluster program to include students, supporting multiple forms of innovation, communication of results, enabling world-class appropriate space and infrastructure, supporting scientific personnel, open access, etc.

UBC is amongst the top 20 public research-intensive Universities in the world. UBC is piloting a number of differentiating areas of support compared to peer institutions. Challenges remain.

# Near-term Plans

This table summarizes some of the near-term plans of the VPRI portfolio to improve UBC's research environment.



	#6 Clusters	#7 Support	#8 Student	#9 KE	#10 Culture
Indigenous and community-based research (e.g., IRSI, CUES)		✓			✓
Interdisciplinary research support (e.g., Clusters, other institutes)	✓	✓	✓		✓
Core facilities/shared infrastructure (e.g., DRI, shared facilities)		✓			
Innovation support (e.g., knowledge exchange, partnerships)		✓		✓	✓
Undergraduate research (e.g., open call)			✓		
Digital supercluster/Cascadia (e.g., mobility grants, project dev't)			✓		✓
Scholarly integrity training					✓

+ working on survey of faculty re. research & innovation env't