



April 28, 2023

Mr. Keelan Buck
Clerk of the Standing Committee on Science and Research (SRSR)
House of Commons
131 Queen Street, 6th floor
Ottawa ON K1A 0A6

Dear Mr. Buck,

Thank you for the opportunity to appear before the House of Commons Standing Committee on Science and Research (SRSR) on March 21, 2023 as part of the Committee's study of how the Government of Canada can better support the commercialization of intellectual property.

Please find below the responses to the three questions posed by Mr. Dan Mazier, Member of Parliament.

Question 1.

"Can you please table with this committee how much money your university has received from the federal government for research and how much your university has made from licensing intellectual property over the last five years? Can you table that report please?"

Licensing revenue represents only one benefit from the federal government's investment in research. UBC research helps advance new knowledge, has led to countless new products, treatments and services, and is the means by which thousands of graduate students refine their expertise before entering the workforce.

The following table details, for the years 2018 through 2022, the amount of federal research funding, and the amount of technology licensing revenue, received by UBC. The technology licensing revenue values represent direct payments to UBC, which are a combination of royalties and liquidated equity.

To provide context for the licensing revenue values, these values represent, on average 1.5% of company value or sales revenue for products based on licensed UBC intellectual property. Thus, for licensing revenue total over the five years it is estimated to represent \$6.6 billion in sales and company valuation, 82% of which were created by Canadian companies.



Year	Federal Research Funding	Tech Licensing Revenue	Estimated Business Performance and Value
2018	\$201,343,969	\$6,137,179	> \$400 million
2019	\$222,629,052	\$8,861,848	> \$500 million
2020	\$235,466,762	\$12,868,417	>\$800 million
2021	\$269,982,609	\$42,922,161	>\$2.5 billion
2022	\$249,161,658	\$27,765,214	>\$1.8 billion

Question 2.

“Can you table with this committee what percentage of your Intellectual Property has been transferred to Canadian companies and non-Canadian companies over the last five years?”

Technology transfer by universities to companies occurs in four formats:

1. Exclusive Licensing - An exclusive license is a legal agreement where the university gives a company the sole and exclusive right to use university owned intellectual property. The university retains ownership of the licensed technology. The company assumes responsibility for developing, manufacturing, marketing, and distributing the licensed product, and pays a royalty or other compensation to the university for the use of the licensed intellectual property.
2. Non-Exclusive Licensing - A non-exclusive license is a legal agreement where the university grants a company the right to use a particular product, technology, or intellectual property, but the university can grant licenses to other companies as well. The company may pay a royalty or other compensation to the university for the use of the licensed intellectual property.
3. Assignment - An assignment is a legal transfer of ownership of intellectual property from the university to another party (assignee). Once the assignment is complete, the assignee assumes full ownership of the assigned rights and can use them as they see fit. An assignment may involve compensation or other terms agreed upon by both parties.
4. Public Domain – Universities play a crucial role in promoting knowledge and innovation by making their intellectual property freely available to the public. This is achieved through various means, including publishing research papers and articles in academic journals, presenting findings at conferences and workshops, and sharing data and software through open-source platforms. By doing so, universities not only disseminate their discoveries and advances to the wider community, but also encourage collaboration, discussion, and further advancement in their respective fields.



For intellectual property that is highly valued, for example a human therapeutic, it is typically exclusively licensed to a company. This allows the company to enforce the patents against competitors, and provides investors with confidence that the funds invested in company R&D can be recouped through future sales of patented products. For the fiscal years 2018 to 2022, UBC entered into:

- 56 exclusive licenses
- 81% with Canadian companies, 11% US companies, 2% UK companies; 6% other
- of the 56 exclusive licenses, 43 were for new Canadian spin-off companies.

Non-exclusive licenses are for intellectual property that has broad applicability in a given sector, such as manufacturing or research tools. Whereas exclusive licenses are granted to a single company, non-exclusive licenses are granted to multiple companies. Over the past five years UBC has entered into:

- 224 non-exclusive licenses
- 56% with US companies, 22% with Canadian companies, 6% UK companies, 16% other

Assignment is common in specific sectors such as software development and with Mitacs funded research. Over the past five years, UBC has entered into:

- 109 assignments
- 85% Canadian entities, 7% US entities, 8% other
- 21 assignments were to new Canadian spin-off companies

Question 3.

“How many patents has the University of British Columbia filed with or transferred to Huawei?”

UBC is an international university with world leading researchers and facilities. Of the approximately \$700 million of research funding UBC researchers attract each year, approximately \$70 million comes from industry sponsored research projects. This research provides the opportunity for faculty, students and staff to conduct applied research that will result in practical solutions for industry partners based upon their academic works. Partnering with industry is particularly important for students and trainees who build external relationships that often lead to future career opportunities. Embracing the challenges of global partners ensures that UBC positively impacts the global community.

Collaborative research agreements with industry always include publication clauses, allowing for public disclosure of discoveries in research journals and at scientific conferences. As a public academic institution, UBC makes its expertise and tools available to industry, government and non-profits that need them to help solve problems.



UBC's research agreements with Huawei Technologies Canada have evolved over time, reflecting guidance from federal partners. This evolution can be broadly broken down into three distinct phases:

1. May 2014 through October 2018 – Intellectual property developed through Huawei sponsored research was assigned to Huawei, consistent with UBC's practice for all industry sponsored research at that time. During this time 8 patent families were assigned to, and have been prosecuted and maintained by Huawei as detailed in the table below. Three additional patent families were initiated by Huawei, however patent prosecution for those patents was subsequently abandoned. None of these patents have been prosecuted in Canada, the technologies can be used in Canada without patent infringement.

Priority Application # Date	Patent Title
US15/080,065 Mar 24, 2016	Photonic elements driven by common electrical driver
US62/325,758 Mar 21, 2016	System and method for precoded faster than Nyquist signaling
US15/059,013 Mar 16, 2016	Systems and methods for data caching in a communications network
US62/322,078 Apr 13, 2016	System and method for faster-than-Nyquist (FTN) transmission
US15/261,486 Sept 9, 2016	Method and apparatus for monitoring and controlling a photonic switch using phase sweeping
US15/400,483 Jan 6, 2017	Optical transmitter
US15/889,919 Feb 6, 2018	Methods and systems for interference mitigation in a dual-polarized communication system
US62/833,338 Apr 12, 2019	Superposition-based transceiver apparatus for efficient spectrum utilization in microwave backhaul links

2. October 2018 through December 2022 - Intellectual property developed through Huawei sponsored research was jointly owned by UBC and Huawei, both parties can practice and license independently of one another. UBC is free to license such IP to Canadian companies.
3. One patent family has resulted from this phase, US62/833,338 (Oct 22, 2021) Methods and systems to produce fully-connected optical beamforming.



4. December 2022 onwards - Intellectual property developed through Huawei sponsored research is owned by UBC, and UBC provides Huawei with a non-exclusive license to use that intellectual property. UBC is committed to adopting research security guidelines that emerge from the Canadian government. UBC reviews all research contracts to ensure compliance with evolving Canadian sanctions and applicable export control legislation. UBC audits every Huawei sponsored research project, and where risks cannot be mitigated, the projects are not allowed to proceed.

The university recognizes the importance of ensuring that its research activities are aligned with the latest guidance from the Federal government and changes in Canadian law. To achieve this, the university is committed to continuously refining its research agreements to ensure that they are up-to-date and compliant with the relevant regulations and policies.

We would be pleased to provide further information or clarification, if desired.

Sincerely,

A handwritten signature in blue ink, appearing to read 'G. Murphy'.

Gail C. Murphy, PhD, FRSC
Vice-President, Research & Innovation
The University of British Columbia