

# COLLEGE OF BIOLOGICAL SCIENCE

## Research Impact and Performance

2020–21



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## Background

The College of Biological Science (CBS) at the University of Guelph (UofG) is a globally-recognized academic institution with a mission to expand the understanding of life, from DNA to cells to complex ecosystems. CBS houses approximately 100 full-time faculty, 50 full-time staff, and 4,500 students – 400 at the graduate level and 4,500 at the undergraduate level. CBS offers 13 majors within three programs (BSc, BSc Env, BASc), four of them with a co-op option. In addition, CBS offers 11 graduate degree programs, including thesis- and course-based masters and PhDs, across three departments: Human Health and Nutritional Sciences (HHNS), Integrative Biology (IB), and Molecular and Cellular Biology (MCB). CBS is also affiliated with the Biodiversity Institute of Ontario (BIO) and the Centre for Biodiversity Genomics (CBG).

In its Strategic Plan 2018–2023, CBS identified various metrics to assess the impact and excellence of its research endeavours, including graduate studies. In this report, we summarize the state of knowledge on these metrics, as well as additional metrics of interest, for the period May 1, 2020 to April 30, 2021. These metrics focus on four themes, as shown in **Table 1** below.

**Table 1.** Research impact and performance metrics assessed in CBS for the period May 2020–April 2021.

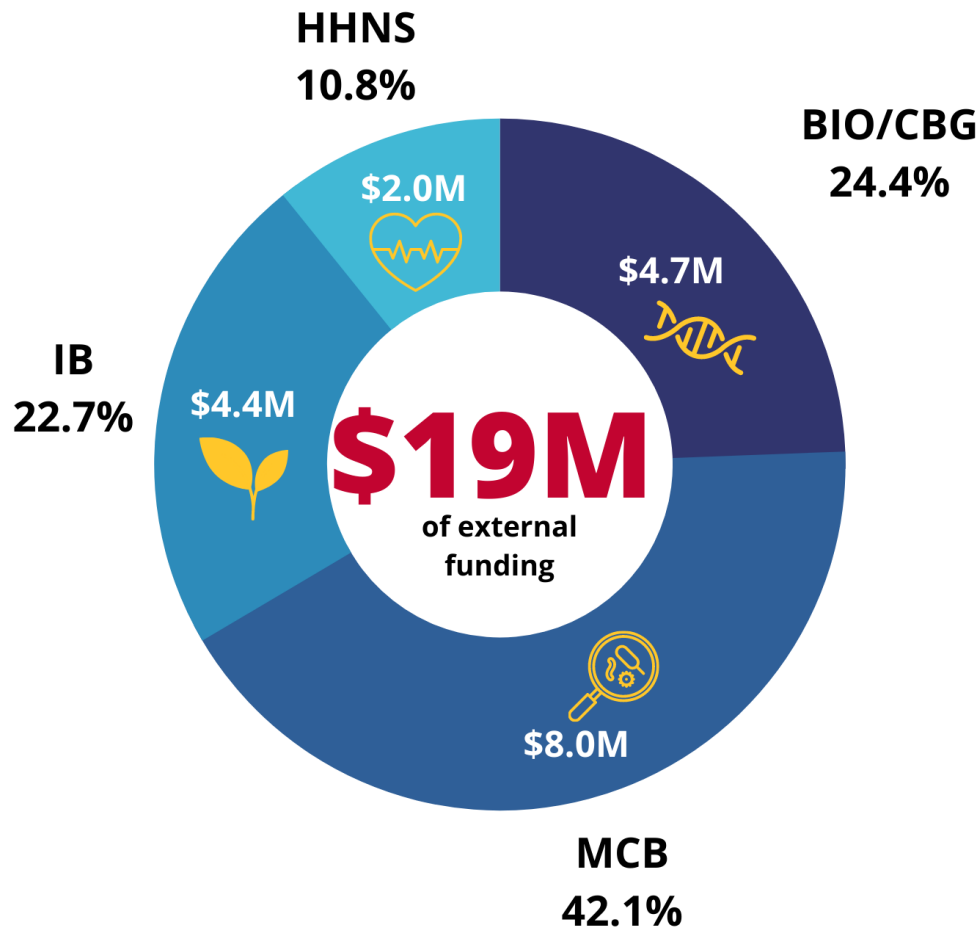
Theme	Research impact and performance metrics
1. Research funding	1.1. Amount of external research funding secured by CBS members 1.2. Percentage of CBS faculty holding tri-agency funding 1.3. Amount of tri-agency and non tri-agency funding brought into CBS 1.4. Number of distinct funding organizations to which CBS faculty apply 1.5. Number of distinct funding organizations providing support to CBS research 1.6. Percentage of CBS faculty holding two or more grants 1.7. Amount of college investment in research support
2. Research excellence and impact	2.1. Number of awards or prizes that recognize excellence in research 2.2. Number of occasions where CBS endeavours are promoted by a credible external party 2.3. Number of peer-reviewed publications 2.4. Citation impact for CBS

Theme	Research impact and performance metrics
	2.5. Percentage of publications that include two or more CBS faculty coauthors
3. SoTL research	3.1. Quantity and citation impact of SoTL publications 3.2. Number of faculty and staff actively engaged in SoTL and teaching innovations 3.3. Number and value of grants awarded for SoTL and teaching innovations
4. Graduate training	4.1. Number of graduate students entering the college 4.2. Amount of research-specific funding awarded to CBS graduate students 4.3. Percentage of full-time students with a major research award 4.4. Time to completion 4.5. Student satisfaction with quality of graduate supervision

## CBS Research Impact and Performance Highlights 2020–2021

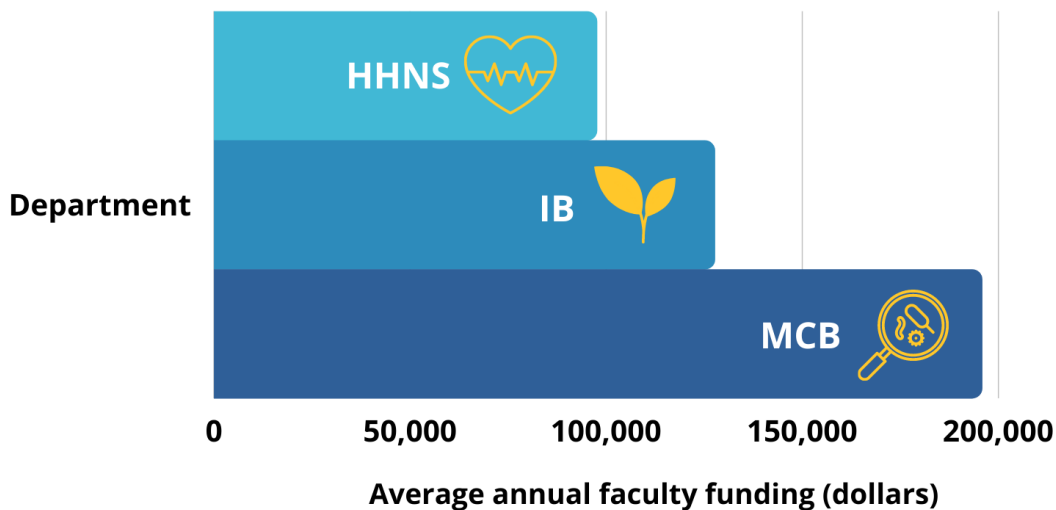
### 1. Research Funding

#### 1.1. Amount of external research funding secured by CBS members



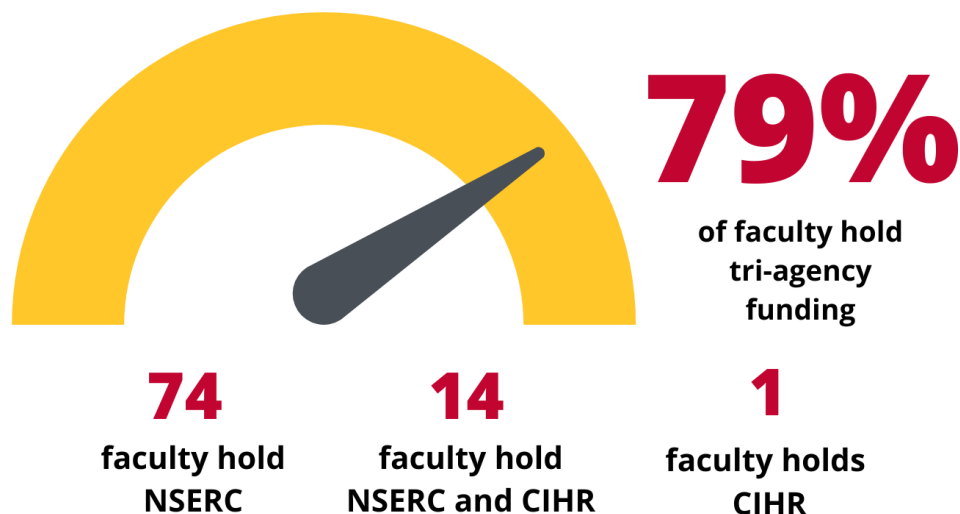
CBS faculty secured a total of \$19,079,273 in external research funding\* in the period May 2020–April 2021. The breakdown of this total was \$8,027,531 for MCB, \$4,658,478 for BIO/CBG, \$4,432,029 for IB, and \$2,051,231 for HHNS. The average funding per year per faculty member was \$195,793 for MCB, \$127,707 for IB, and \$97,678 for HHNS.

*\*Includes major advancement funds that have a dedicated account in ORS.*



Data source: Office of Institutional Research and Planning.

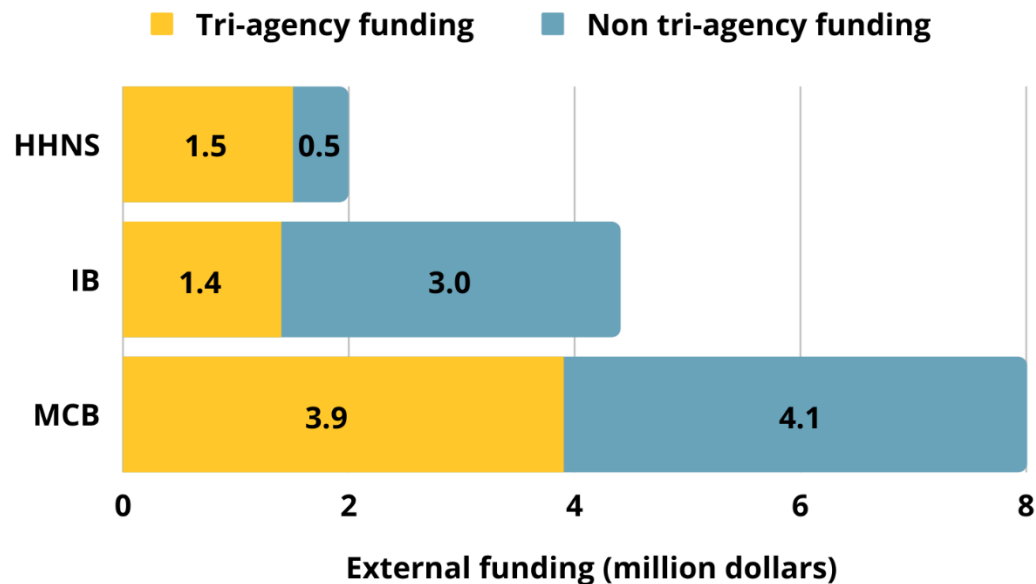
#### 1.2. Percentage of CBS faculty holding tri-agency funding



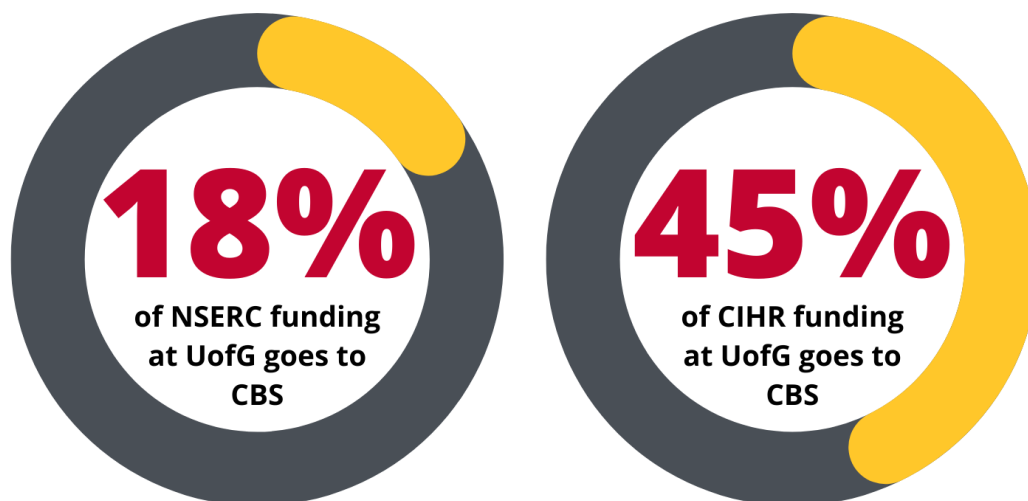
In the reporting period, 79.4% of CBS faculty members (89 out of 112\*) held tri-agency funding. Most faculty (74) held funding from the Natural Science and Engineering Research Council (NSERC), while 14 others held both NSERC and Canadian Institutes of Health Research (CIHR) grants concurrently, and one faculty held CIHR alone.

Data source: Office of Institutional Research and Planning. \*Includes 102 tenure-track/tenured faculty, as well as seven adjunct and three retired faculty who held funding during 2020–21.

### 1.3. Amount of tri-agency and non tri-agency funding brought into CBS



CBS faculty secured \$6,953,061 from tri-agency and \$12,126,212 from non tri-agency sources. HHNS primarily receives tri-agency funding (\$1,555,085 tri-agency; \$496,150 non tri-agency), whereas IB receives more funding from non tri-agency sponsors (\$2,990,099 non tri-agency; \$1,351,930 tri-agency). MCB receives comparable amounts of funding from tri-agency (\$3,880,246) and non tri-agency sources (\$4,147,245). BIO/CBG funding comes primarily from non tri-agency organizations (\$4,492,678 non tri-agency; \$165,800 tri-agency). Overall, CBS faculty received \$4,628,126 from NSERC and \$2,324,934 from CIHR. This means CBS secured 18.05% of total NSERC and 45.5% of total CIHR funding at UofG.



*Data source: Office of Institutional Research and Planning.*

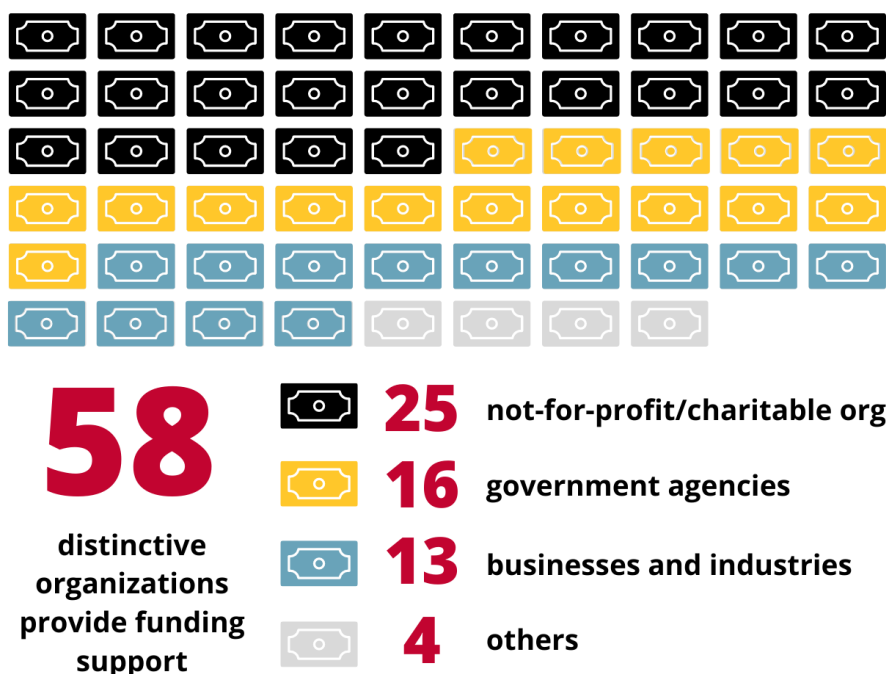


### 1.4. Number of distinct funding organizations to which CBS faculty apply

CBS faculty applied to 56 distinct funding organizations during 2020–21. These included the Canada Research Coordinating Committee (New Frontiers Research Fund), CIHR, NSERC, the Smithsonian Institute, Environmental and Climate Change Canada, Ontario Ministry of Colleges and Universities, Ontario Genomics, Mitacs, and the Heart and Stroke Foundation of Canada, among others.

*Data source: Office of Institutional Research and Planning.*

### 1.5. Number of distinct funding organizations providing support to CBS research



A total of 58 organizations provided research funding to CBS in the reporting period May 2020–April 2021. The 25 (43.1%) not-for-profit or charitable organizations that funded CBS research included Cancer Research UK, Mitacs, Heart and Stroke Foundation of Canada, Ontario Genomics, the G. Magnotta Foundation, and the W. Garfield Weston Foundation. The Canadian government (both federal or provincial) also supported CBS research through 16 agencies and/or programs. Some examples at the federal level include Fisheries and Oceans Canada, Environment and Climate Change Canada, the Canada Foundation for Innovation, and Polar Knowledge Canada. At the provincial level, CBS research was supported by the Ministries of Environment, Conservation, and Parks; Northern Development, Mines, Natural Resources and

Forestry; Agriculture, Food, and Rural Affairs (through its partnership agreement with UofG); and, Colleges and Universities. Last, but not least, 13 distinct businesses and industries (e.g., Syngenta, Atlas 365, TRU-ID Ltd., grower associations) and four other groups (e.g., United States government and universities) also supported CBS research in 2020–21.

*Data source: Office of Institutional Research and Planning.*

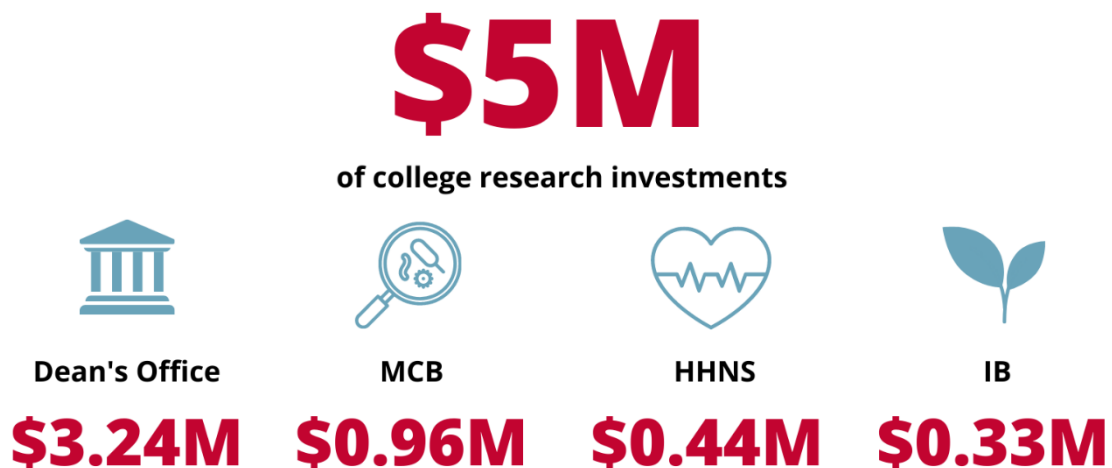
#### 1.6. Percentage of CBS faculty holding two or more grants

Fifty-one percent of CBS faculty (57 out of 112\*) held two or more grants in the reporting period. Three faculty members each held 10 grants, the highest number of grants held by a single faculty member. A total of 228 unique research projects were carried out in 2020–21 across CBS.



*Data source: Office of Institutional Research and Planning. \*Includes 102 tenure-track/tenured faculty, as well as seven adjunct and three retired faculty who held funding during 2020–21.*

#### 1.7. Amount of college investment in research support



Research investments by the College in 2020–21 amounted to \$4,965,125. Most of the investment was put towards Grad Growth Funding transfers to faculty and CBS-funded scholarships and awards (\$1,753,898), start-up funding for new faculty (\$1,026,118), and research-related staffing and research stipends for Associate Deans and Chairs (\$1,017,345). Other significant investments included operation of facilities (AAC: \$301,189; Aqualab: \$218,659; HNRU: \$177,532; Animal Wing: \$163,387), as well as ADR operations and *ad hoc* general research support (\$306,997), which included college contributions for matching funds.

*Data source: CBS Dean's Office.*

## 2. Research Excellence and Impact

### 2.1. Number of awards or prizes that recognize excellence in research



Kevin McCann was inducted into the Royal Society of Canada in 2020. In addition, Rebecca Shapiro's research excellence was recognized with an Early Researcher Award from the Ontario government; Leah Bent and Hafiz Maherali received UofG Research Leadership Chairs; and, Amy Newman was recognized with a UofG Research Excellence Award. In the reporting period, four CBS faculty held a Canada Research Chair (CRC): Emma Allen-Vercoe (Tier 1), Chris Whitfield (Tier 1), Paul Hebert (Tier 1), David Wright (Tier 2), and Nina Jones (Tier 2).

*Data source: CBS Dean's Office, Royal Society of Canada, Government of Ontario, Office of Institutional Research and Planning.*

## 2.2. Number of occasions where CBS endeavours are promoted by a credible external party

The College was mentioned at least 35 times on external websites and featured 49 times on the UofG News website. The contexts in which CBS endeavours were promoted include research produced in CBS, new appointments in leadership, the work of alumni, conferences and presentations by faculty and students, scientific translation/outreach pieces written by CBS members, faculty and student awards, and open-source research articles.

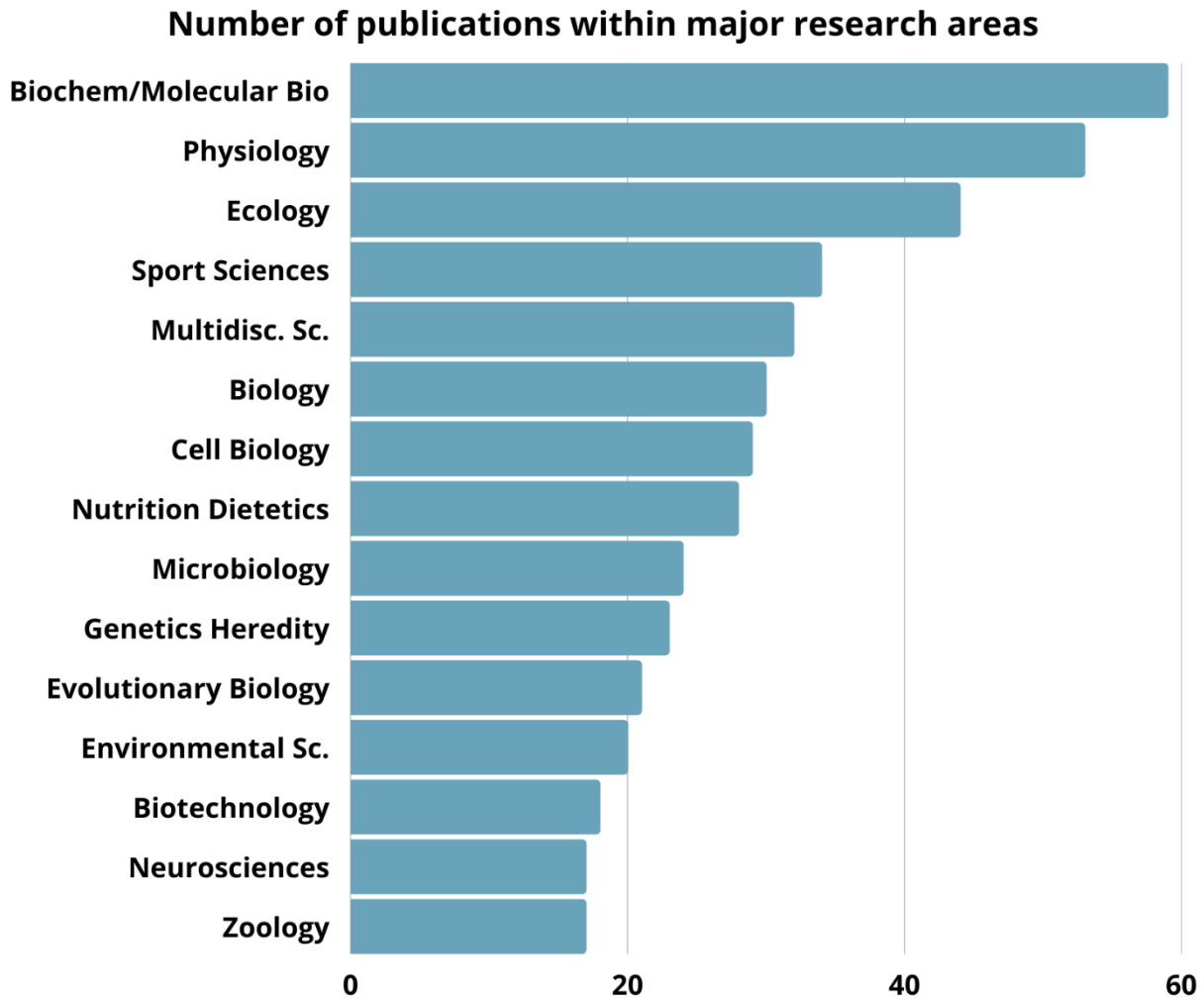
*Source: Google, UofG News.*



## 2.3. Number of peer-reviewed publications



According to Web of Science, CBS produced a total of 407 publications (peer-reviewed articles) between May 2020 and April 2021. Out of these 407 papers, 169 were published by IB/CBG/BIO, 134 by HHNS, 101 by MCB, and 3 were interdepartmental collaborations. The breadth of disciplines represented in these traditional research outputs is a result of the diverse research happening across CBS, from biochemistry and molecular biology, to physiology, ecology, sport science, nutrition, microbiology, environmental sciences, and neuroscience, among others.



*Data source: Web of Science. Notes: The classification of publications into research areas is provided by Web of Science; a publication can be classified into more than one research area; the graph does not show all research areas.*

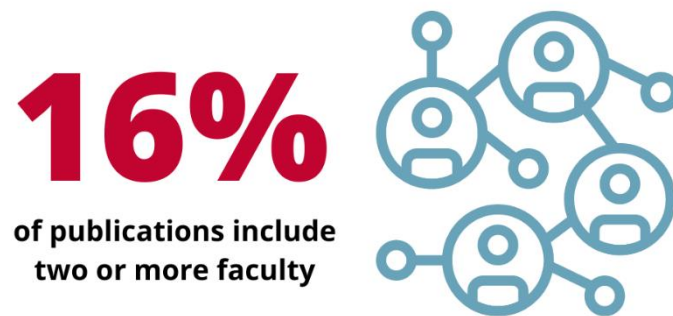
#### 2.4. Citation Impact for CBS

The 407 publications produced by CBS between in the fiscal year 2020–21 had received 1,488 citations by March 2022, resulting in an average citation rate of 3.66. For comparison purposes, Web of Science baseline citations rates (i.e., expected citations) in March 2022 for papers published since 2020 were 3.08 for plant and animal science, 5.02 for neuroscience and behaviour, 7.9 for microbiology, 5.39 for environment/ecology, 5.86 for biology and biochemistry, and 7.41 for molecular biology and genetics.

To add more context to the impact of CBS publications, papers published by CBS faculty since 2018 (which have had more time to gain traction) had received a citation rate of 11.57 by June 2022. Baseline citations rates reported by Web of Science in June 2022 for papers published since 2018 were 8.67 for plant and animal science, 15.25 for neuroscience and behaviour, 15.29 for microbiology, 15.07 for environment/ecology, 15.89 for biology and biochemistry, and 21.27 for molecular biology and genetics.

*Data source: Web of Science.*

## 2.5. Percentage of publications that include two or more CBS faculty coauthors



Out of the 407 publications produced by CBS, 15.7% (64) are collaborations that include two or more CBS faculty as co-authors. When looking at the affiliation of those CBS co-authors, 61 were intradepartmental collaborations (within HHNS, MCB, or IB/CBG), and three were interdepartmental (across departments).

*Data source: Web of Science.*

## 3. SoTL Research

### 3.1. Quantity and citation impact of SoTL publications

Seven publications were produced by CBS faculty and staff in the Scholarship of Teaching and Learning (SoTL) during the reporting period. The average citation rate of these publications in March 2022 was 2.28, while the baseline citation rate for 2020 social sciences papers was 2.76.

*Data source: Web of Science, Google Scholar.*



### 3.2. Number of faculty and staff actively engaged in SoTL and teaching innovations

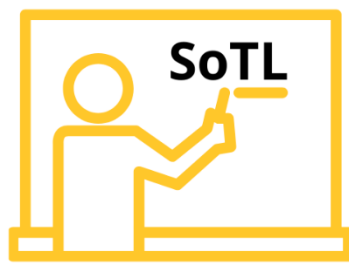
Approximately 16 faculty and 16 staff members across CBS conduct research in SoTL and/or are involved in the design and development of innovative teaching practices.

*Data source: COESP.*

### 3.3. Number and value of grants awarded for SoTL and teaching innovations

The College of Biological Science Office of Educational Scholarship and Practice (COESP) supported a \$7,000 BioEd Research Grant, a \$1,500 BioEd Seed Grant, and a \$250–500 COESP BioEd Graduate Student Research Award, setting the internal investment in SoTL at \$9,000.

*Data source: COESP.*



# 16

staff involved in innovative  
teaching practices

# \$9K

in grants and scholarships  
awarded by COESP

# 16

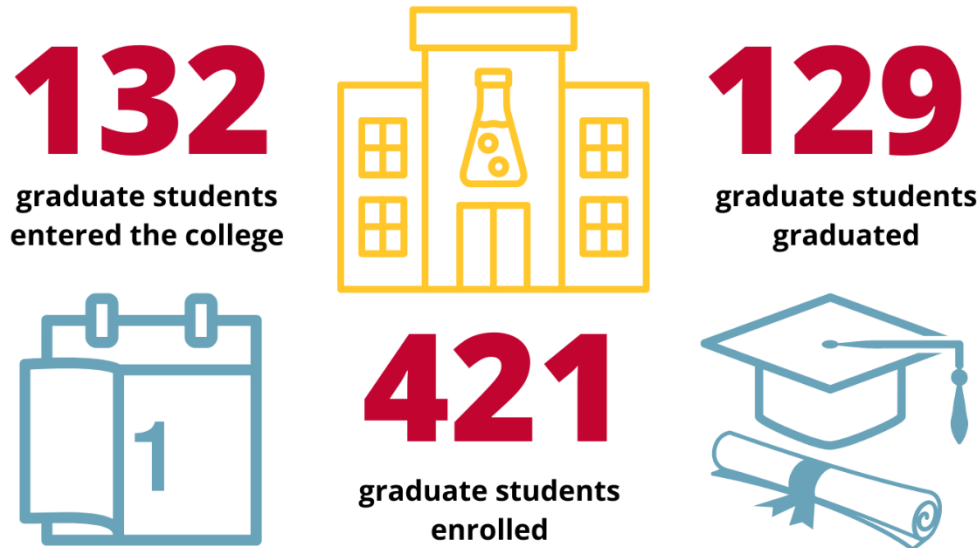
faculty conducting  
SoTL research

# 7

peer-reviewed  
publications

## 4. Graduate Training

### 4.1. Number of graduate students entering the college



In 2020–2021, 132 graduate students entered CBS to pursue graduate studies: 121 students enrolled in a master’s program (thesis or coursework) and 11 in a PhD program (transfer students not included). In the same period, 129 students graduated — 101 from a master’s program and 28 from a PhD program. The total enrollment during the reporting period was 421: 75 in course-based masters (18 MBINF, 24 MBIOT, 33 HHNS), 157 in MSc (8 BINF, 33 HHNS, 58 IB, 49 MCB, 9 collaborative programs), and 189 in PhD (5 BINF, 42 HHNS, 59 IB, 68 MCB, 15 collaborative programs).

*Data source: Office of Institutional Research and Planning.*

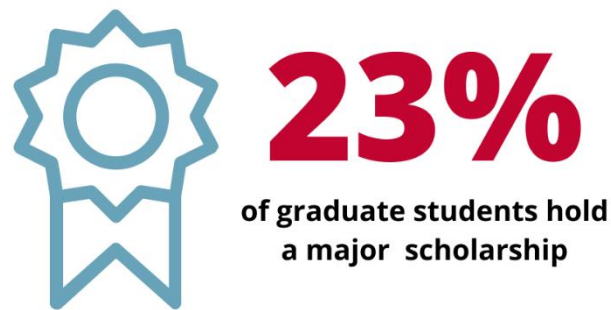
### 4.2. Amount of research-specific funding awarded to CBS graduate students



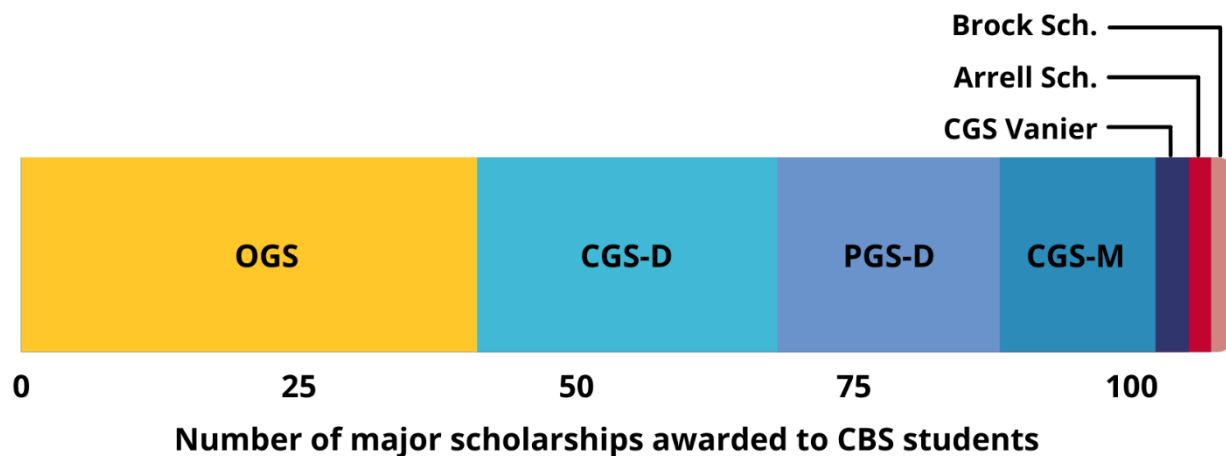
CBS graduate students in thesis-based programs received a total of \$2,800,408 in scholarships from sources outside the college. The CBS graduate student body saw an additional \$173,060 in the form of bursaries. Overall, 243 students (57.7%) received some form of external scholarship or bursary support for their graduate studies.

*Data source: Office of Institutional Research and Planning.*

#### 4.3. Percentage of full-time students with a major research award



During 2020–21, 98 graduate students (23.3% of the graduate student population) held a total of 109 major awards. Of these awards, 41 were Ontario Graduate Scholarships (OGS), 27 were Canada Graduate Scholarship–Doctoral (CGS-D), 20 were Postgraduate Scholarship–Doctoral (PGS-D), and 14 were Canada Graduate Scholarship–Masters (CGS-M). Two students held Arrell Scholarship funding and another two were supported by a Brock Doctoral Scholarship. To top this up, three students held the prestigious Vanier doctoral scholarship.



*Data source: Office of Graduate and Postdoctoral Studies.*

#### 4.4. Time to completion



# 14.2 & 6.9

**terms have been the time to completion for PhD (2014-15 cohort) and master students (2017-18 cohort), respectively**

The cohort of PhD students who started their program in 2014–15\* has graduated with an average time to completion of 14.2 terms. Master students who entered the college in 2017–18\* have needed, on average, 6.9 terms to complete their program\*\*. These numbers are the same with and without leaves of absence. The cumulative average for time to completion in CBS (since 2003–04) is 14.2 terms for PhD programs and 6.1 terms for master programs.

*Data source: Office of Institutional Research and Planning. \*Most recent year for which at least 90% of the cohort have graduated. \*\*Some delays were caused by the pandemic.*

#### 4.5. Student satisfaction with quality of graduate supervision



# 77%

**of students are satisfied with their graduate supervision**

On average, 77% of graduate students in CBS have expressed satisfaction with the quality of their graduate supervision. There were small differences between departments, being HHNS the department with the highest satisfaction (80%), followed by MCB (76%) and IB (75%).



## Students agree that their advisor...

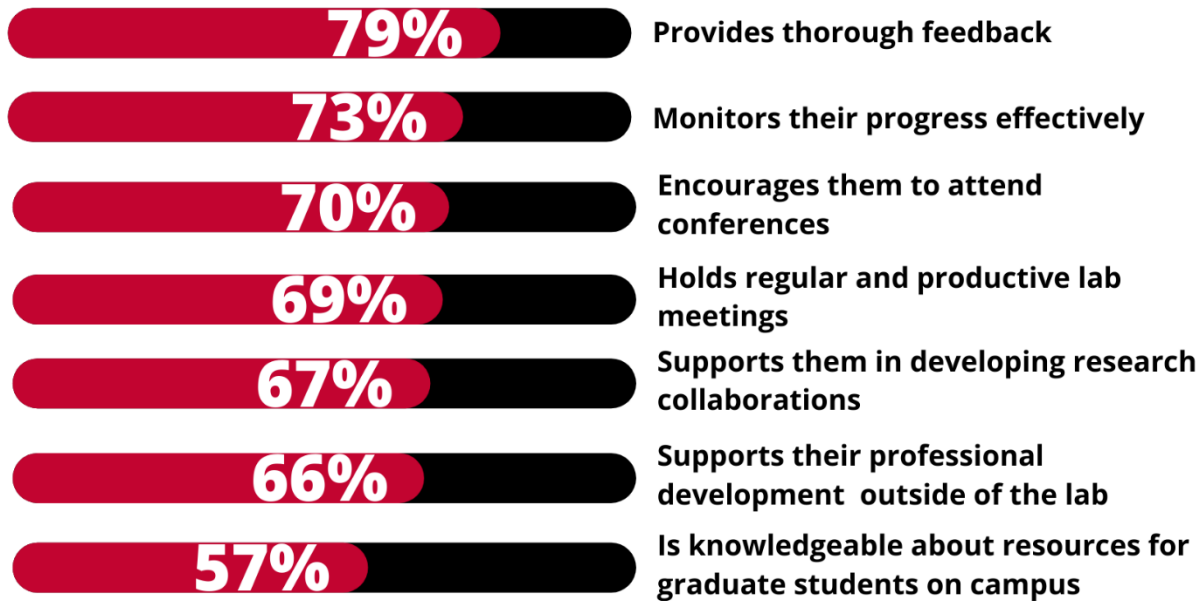


In general, most students agree (somewhat agree or completely agree) that their advisor is available to meet when needed (92%), has good disciplinary knowledge about their thesis (87%), stimulates their intellectual development (85%), and encourages creativity in their project (84%). Most students (86%) also think that their advisor cares about their well-being, ensures students have the resources they need for their research, and provides a safe and respectful work environment.

Students across CBS expressed lower agreement with other aspects of their graduate supervision. These include, for example, their advisor's capacity to provide feedback (79%), monitor their progress effectively (73%), encourage conference attendance (70%), hold productive lab meetings regularly (69%), support the development of research collaborations (67%), support professional development opportunities outside the lab (66%), and have knowledge about resources available to graduate students across campus (57%).



## Students agree that their advisor...



*Data source: ADR Office 2020 Quality of Graduate Supervision Survey.*

## Moving Forward

The College looks forward to continuing the monitoring of these Research Impact and Performance metrics on an annual basis. The purpose of this is to guide evidence-based decision-making and to identify new priorities and initiatives for research and graduate studies. The information contained in this report will be used to assess CBS strengths and weaknesses, but more importantly to reflect upon the past and identify areas of improvement for the future, especially as the College embarks into the creation of a 2023–2028 Strategic Plan.

Any comments or questions about this report can be directed to [cbsadr@uoguelph.ca](mailto:cbsadr@uoguelph.ca).