



DEAN'S

ANNUAL

REPORT

UNIVERSITY OF TORONTO
FACULTY OF DENTISTRY 2017-18

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DEAN'S

MESSAGE

I am very pleased to present the first Dean's report from the Faculty of Dentistry at the University of Toronto. We plan to provide a report annually that will illustrate our progress and evaluate our school and its impact on our communities. I would submit that the advancements noted here are not only markers of our efforts of the 2017-18 academic year, but also of our greater visioning process over the last number of years.

As the first and largest dental school in Canada, we have much of which to be proud. While this report focuses on our accomplishments in 2017-18, we have a long history of significant achievements. For example, we have had five faculty members named to the Order of Canada — including one this past year, as noted in these pages. We have had eight winners of the International Association of Dental Research Distinguished Scientist Awards; three presidents of

this premier dental research organization have been graduates of our school. We have members in the Royal Society of Canada and the Canadian Academy of Health Sciences. Our faculty members repeatedly win international awards for their achievements.

Over the past number of years, the Faculty has been involved in the difficult work of re-envisioning itself. We have instituted changes across all sectors: in our leadership and leadership structure, research enterprise, facilities, curriculum and more. We are not erasing our past; we are building upon foundations of excellence across education, research and patient care.

As the information compiled here will suggest, UofT Dentistry has exceptional strengths. We are rightly proud of our reputation as being among the world leaders in dental research and education.

One of our strengths is our research enterprise,

which sits at the heart of the University of Toronto's mission. Increasingly, the link between oral health and overall health is being acknowledged, as is the need for collaborative, multi-disciplinary approaches to health problems. UofT Dentistry is a front runner in this regard. While this report assesses our research output and successes, it does not fully convey the sweeping, cross-disciplinary, globally collaborative nature of our research, nor our remarkable network of research and entrepreneurial partnerships. Our vision is to integrate foundational research with clinical care, to move discoveries faster from bench to chair in an effort to improve the lives of our patients, and by doing so, make notable contributions to the study of human health.

Our school additionally offers a unique breadth in clinical and didactic education, with graduate programming in each of the ten specialties recognized in Ontario, a highly competitive doctor of dental surgery degree and an international dentist advanced placement program. While we have always provided students with a rigorous academic foundation, we want to ensure that our curriculum and the student experience are continually improving. Consistent with UofT President Meric Gertler's priority of re-envisioning undergraduate education, we have introduced changes to our DDS program, such as the introduction of global service learning that offers students a unique range of local, national and international experience.

While we reflect upon our successes of the past year, however, it is also time for us to look forward to exciting opportunities ahead. Consistent with our vision, to improve health by advancing dentistry through inspired leadership, innovation and excellence in education, research and practice, our goals are to remain global thought leaders and influencers. We strive to make a significant impact on human health and disease — and to do so continually for generations to come.

“ Our vision is to integrate foundational research with clinical care, to move discoveries faster from bench to chair in an effort to improve the lives of our patients, and by doing so, make notable contributions to the study of human health.



A blue-tinted photograph of two surgeons in an operating room. They are wearing blue scrubs, surgical masks, and hairnets. One surgeon is on the left, and the other is on the right, both focused on a patient lying on an operating table. A large surgical light is positioned above them, illuminating the scene. The background shows various pieces of medical equipment and the structure of the operating room.

01

BY THE

NUMBERS

OFFICER OF THE ORDER OF CANADA

John B. Macdonald, 4T2 (Alumnus)

ORDER OF CANADA

Jack Gerrow, 7T9 (2018)
Tom Harle, 8T0, 8T9, 9T0 (Alumnus)
George Zarb (2008)
Norman Levine, 6T0, 6T2, 6T7 (2008)
Dennis Smith (2006)
Donald Woodside (1996)

FELLOW OF THE ROYAL SOCIETY OF CANADA

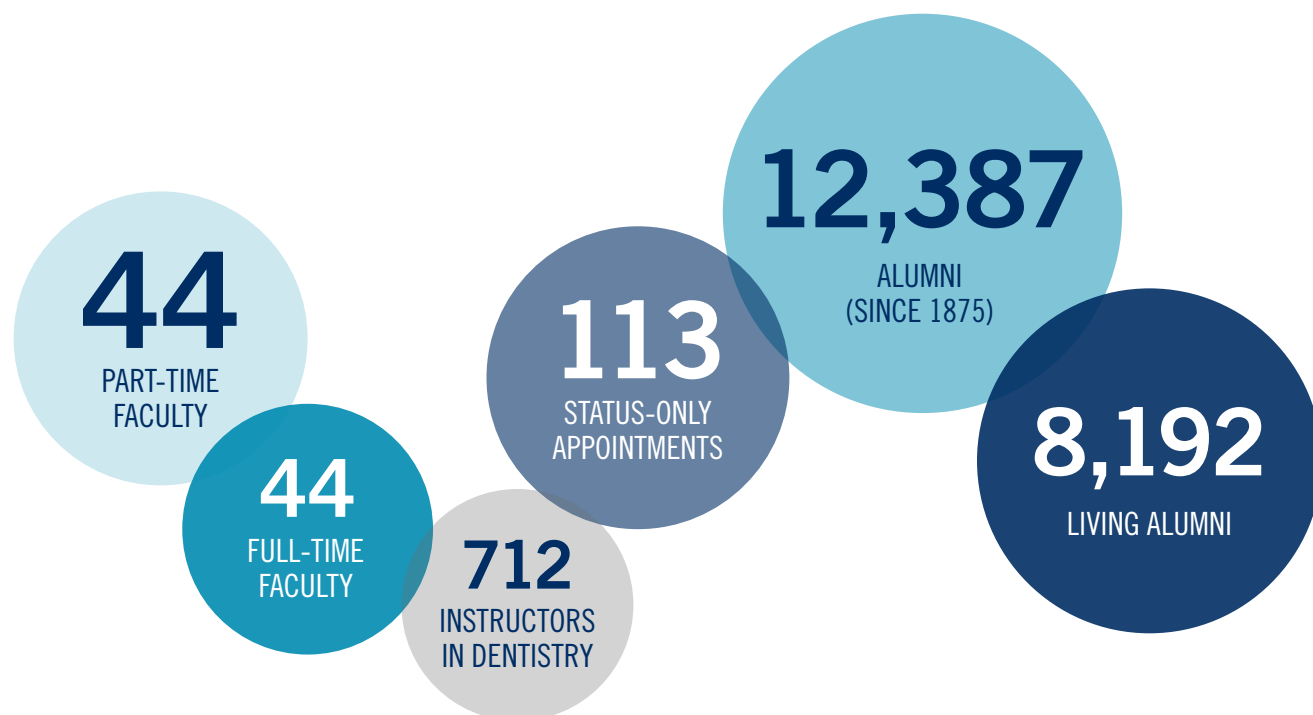
Barry Sessle (1996)
Dennis Smith (1991)

IADR DISTINGUISHED SCIENTIST AWARD

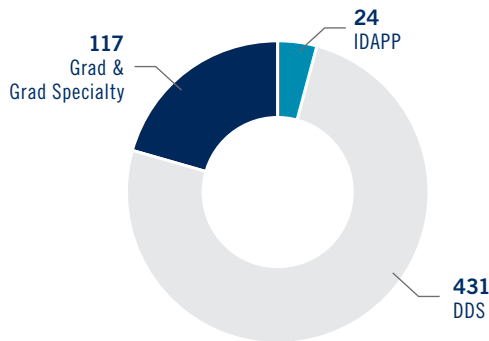
Christopher McCulloch, 7T6, 8T2 (2009)
Daniel Haas, 7T9, 8T8 PhD (2004)
Anders Bennick, 6T4, 6T5 (2003)
Jaro Sodek (2001, 1989)
David Locker (1998)
Jane Aubin (1985)
Dennis Smith (1976)
Barry Sessle (1976)

Our Community

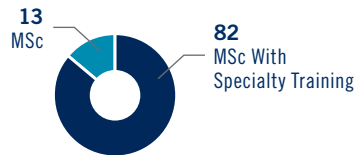
Diverse, vibrant — and growing.



Students



TOTAL **572** | No. of Students Enrolled At The Faculty Of Dentistry 2017-18



95 | MSc Students



22 | PhD Students

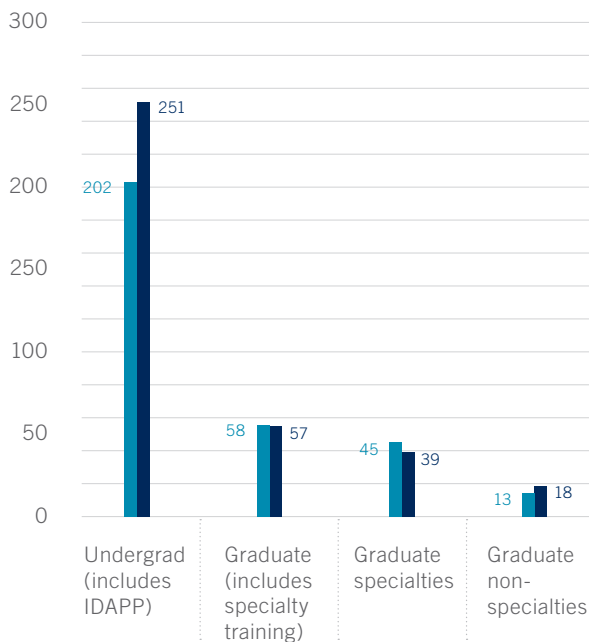
Gender Parity: Closing The Gender Gap

The Faculty of Dentistry is committed to eradicating discriminatory barriers to the education and practice of dentistry. One important metric of this goal is gender, specifically, the number of female applicants and students enrolled.

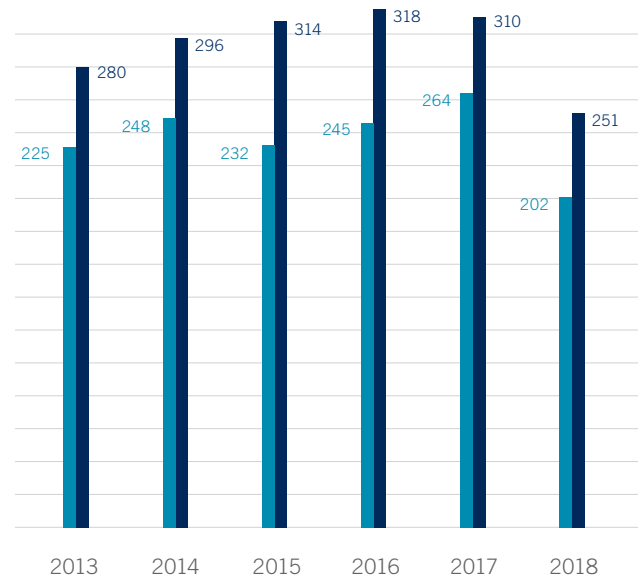
HOW FAR HAVE WE COME? Where the profession of dentistry was once characterized by its lack of female graduates, the current student body paints a picture of gender parity.

What's more, overall, there were more female students enrolled in 2017-18 than male, a trend that has been consistent for the past five years.

2017-18: ● Male ● Female



5 YEARS OF DATA (2013-18): ● Male ● Female



Funding

DDS



\$747,536

TOTAL BURSARIES AWARDED

\$50,904

TOTAL ACADEMIC AWARDS

GRAD



\$56,500

BURSARIES

\$335,497

AWARDS

\$277,997

GUARANTEED FUNDING

Continuing Education

The Faculty of Dentistry continued to offer superlative continuing dental education programming in 2017-18, with an emphasis on growing its easy-access, online programming (utooth.ca).

69

— Live Course Instructors

18

— utooth.ca (Online CDE course portal) Instructors

1,481

— Participants Registered In Live Courses

6,100

— Users Registered To utooth.ca (Online CDE course portal)



WOMEN IN DENTISTRY

During the 2017-18 academic year, female students at the Faculty founded a new club, Women in Dentistry @ UofT, with the goal of aiding fellow female students entering the profession.

02

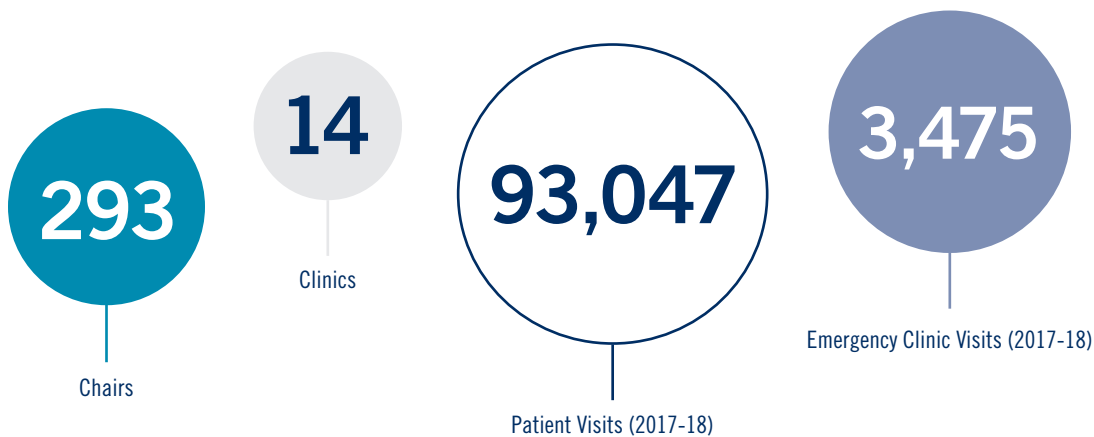
IMPACT



Advancing Our Mission

In 2017-18, the Faculty of Dentistry made outstanding strides in fulfilling its vision to improve health by advancing dentistry through inspired leadership, innovation, and excellence in education, research and practice.

Who We Serve: Patients



Advancing Care

With changes to the DDS3 academic year and the undergraduate class size (for more information, please see the **RENEWAL** section) UofT Dentistry has seen a huge jump in patient numbers at its Elm Street clinics. Last year, there were 4,115 more patient visits logged than the previous year. Over the past five years, patient visits have increased by 15,000.

These increases do not take into account additional service learning rotations added recently, including student rotations at Addis Ababa University, Uganda, Honduras, Guatemala; provincially in Haliburton; and locally in the Greater Toronto Area at the Centre for Addiction and Mental Health (CAMH) and St. Michael's Hospital.

Supporting The Infrastructure:

DPES And DPES Pro

One of the unique ways UofT Dentistry contributes to our communities is through the creation and dissemination of the DPES (Dental Procedure Education System) and DPES Pro video series.

A collaborative effort between faculty and staff in the IITS and communication offices, DPES Pro is a one-of-a-kind series of short animated or live demonstration videos specifically created to help further dental student education. Dental students gain access to in-depth procedural and informational materials that help them hone their skills and knowledge.

The non-pro series, on the other hand, educates the public about dental procedures — and what to expect when they arrive for treatment. These videos range in subject material, from how to become a patient to how oral abscesses are treated.

JUST HOW POPULAR IS THE SERIES?

CHECK OUT THESE NUMBERS:

47,000

Of DPES Plays

5M:15S

Average Length Of View

**13,105
PLAYS**

(Ontario, CA) Highest
Access Rate By Region

MOST POPULAR VIDEOS:



Soft Tissue Examination
(DPES PRO)



Class II Composite
Restorations (DPES PRO)



Bitewing Radiographic
Technique (DPES PRO)

Rankings & Honours 2017-18

UofT Dentistry Teaching Awards

THE BRUCE HORD MASTER TEACHER AWARDS

These awards are presented annually in recognition of individuals who are exemplary role models, clinicians and teachers.

[Dr. Greg Anderson](#)

[Dr. Anthony Joseph Stokl](#)

THE W.W. WOOD AWARD FOR EXCELLENCE IN DENTAL EDUCATION

This award was established by the Association of Canadian Faculties of Dentistry to honour a faculty member who consistently demonstrates teaching excellence.

[Dr. Grace Bradley](#)

AWARD OF DISTINCTION 2018

Alumnus [Dr. James Leake](#) received the Faculty of Dentistry's highest recognition, the Award of Distinction, in 2018. The award recognizes Dr. Leake's impact in the field of dental public health, evidenced-based dentistry, and Indigenous reconciliation.

External Awards

Adjunct professor [Jack Gerrow](#) was named to the Order of Canada, one of the country's highest civilian honours, for his contributions to dentistry education. Gerrow recently received a Gies Award for Innovation from the American Dental Education Association (ADEA).

—
Professor [Michael Glogauer](#) was elected as a member of the Canadian Academy of Health Sciences.

—
Professor [Paul Santerre](#) was awarded one of seven inaugural University of Toronto President's Impact Awards (PIA). The award acknowledges the impact of his work beyond academia in research, translation and commercialization. He was also awarded the Baxter Chair of Health Technology and Commercialization, and received a prestigious Ontario Professional Engineers Award for his entrepreneurship.

—
Professor [Shimon Friedman](#) was awarded the I.B. Bender Lifetime Educator Award from the American Association of Endodontics for his commitment to excellence in education over the course of his career.



—
Professor [Calvin Torneck](#) was awarded the Part Time Educator Award from the American Association of Endodontics. In recognition of Torneck's immense lifetime contributions, this year the AAE renamed the award, which will now be the Calvin D. Torneck Part Time Educator Award.



Research Impact

The Canadian Foundation for Innovation and the Ontario Research Fund awarded professor [Chris McCulloch](#) (Tier 1 Canada Research Chair in Matrix Dynamics) and eight other investigators, including distinguished professor [Boris Hinz](#) and Institute of Biomaterials & Biomedical Engineering (IBBME) cross-appointed professor [Craig Simmons](#), \$6.5M to put towards new equipment and \$900,000 over five years to establish a Fibrosis Research Network.

[Boris Hinz](#) was additionally awarded \$3.2M from CIHR over seven years to further his research on fibrosis.

[McCulloch](#) and [Simmons](#) also won \$550,000 from the Connaught Fund at the University of Toronto to help establish the University as a fibrosis research hub.

[Grace de Souza](#), [Bernhard Ganss](#), [Massieh Moayed](#), [Anuradha Prakki](#) and [Paul Santerre](#) received prestigious Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grants in November, totalling just over \$680,000 in funding. This brings the total number of NSERC grants concurrently held by Dentistry researchers to ten — a new record. Four winners were announced previously: [Karina Carneiro](#), [Siew-Ging Gong](#), [Anil Kishen](#) and [Tara Moriarty](#).

Assistant professor [Limor Avivi-Arber](#) was awarded a two year, \$150,000 CIHR Catalyst Grant for her study of intraoral injuries.

Professor emeritus [Robert Pilliar](#) was awarded a \$100,000 Connaught Fund Innovation Award to continue pursuing his work on tissue-engineered joint implants.

Assistant professor [Eszter Somogyi-Ganss](#) was awarded a \$25,000 American College of Prosthodontics, GSK Prosthodontist Innovator Award for her work on bone remodelling via pulsing by electromagnetic implants.

Professor [Anil Kishen](#) was awarded \$19,200 from the Ontario Centres of Excellence Voucher of Innovation and Productivity (VIP) program to continue his research on nanovarnish and its ability to counter caries.

Assistant professors [Marco Magalhaes](#) and [Karina Carneiro](#) were awarded Connaught New Researcher Awards from the University of Toronto, valued at \$10,000 each.

“ Indigenous community participants are creating digital stories that walk viewers through their personal narratives of oral health and dental care.

Seeking Indigenous-Centred Interventions

A one-of-a-kind study is building partnerships with Indigenous communities in Ontario and Manitoba to help curb the high rates of early childhood caries (ECC) in remote Indigenous communities. Children in these communities are at a significantly higher risk of developing the disease that often requires invasive dental interventions.

Associate professor **Herenia Lawrence** is the recipient of a major Canadian Institutes of Health Research (CIHR) Team Grant, which enters into its second phase this year. The first phase of the study saw Lawrence and health professionals local to communities in northern Ontario and Manitoba complete a blind study, where fluoride varnish was applied to the teeth of Indigenous children. Accompanying culturally sensitive educational interviews were also provided to families.

In this phase of the project, Lawrence and her research team have committed to partnering with Indigenous groups and communities in an effort to develop culturally appropriate health intervention strategies. One such strategy draws upon an age-old tradition, storytelling — but with a twist: it's gone digital.

Indigenous community participants are creating digital stories that walk viewers through their personal narratives of oral health and dental care. While using digital platforms for storytelling is not new in First Nations communities, research is showing that such tools are very effective ways to create participatory relationships with viewers for promoting health and well-being. Another strategy under review is the use of Silver Diamine Fluoride, an effective, non-invasive treatment to arrest the progression of caries in primary teeth. Lawrence and her research partners have held a number of traditional learning circles with parents in the participating communities to discuss this treatment option.

With this multi-pronged approach, the team hopes to find more effective and non-invasive methods of reducing ECC among Indigenous children, who often have to undergo treatment for caries under general anaesthesia, sometimes hundreds of kilometres outside of their communities.



Student Honours

CIHR Student Awards

\$105,000

EACH, OVER 3 YEARS

Mehrnoosh Neshatian
& Jeff Chadwick

CADR – NCOHR Student Research Awards:

A remarkable five awards went to UofT Dentistry students in 2017-18.

SENIOR – BASIC SCIENCE CATEGORY:
Muna Marashdeh
Hayden Mahdi

JUNIOR CATEGORY:
Kelsey O'Hagan Wong
Alina Phen

UNILEVER/HATTON COMPETITION AT THE IADR, JUNIOR CATEGORY:
Tong Chen

DENTSPLY SIRONA Restorative Global Clinical Case Contest

INAUGURAL CANADIAN COMPETITION:
Yi-Shan (Annie) Liu



CIHR – IMHA

Eight graduate students won highly competitive grants from the Canadian Institute of Health Research's (CIHR) Institute of Musculoskeletal Health and Arthritis during the latest round of funding, accounting for over one quarter of the total CIHR funds awarded across the University of Toronto.

Chen (Wayne) Fang
Jeremy Ho
Sally Liu
Anish Nanda

Leslie Park
Matthew Preston
Po-Han Wu
Nevena Zivkovic

Staff Excellence Awards

These annual awards celebrate staff members who have demonstrated excellence in their work and who have earned the respect of their colleagues for their professionalism, teamwork and/or contribution to the Faculty's morale.

2017-18 WINNERS:

Dorcas Johnson, senior HR & payroll administrator
Marie-Christine Kean, academic administrator for instructors in dentistry
Gail Lawrence, clinical procurement coordinator



Major Gifts

With a huge thanks to our alumni, community and friends, giving to the Faculty totalled more than \$1.5M this year.

The Faculty of Dentistry received a landmark gift for Access to Care, a fund that helps reduce the burden of cost for the Faculty’s patients. Alumnus [Dr. George Christodoulou](#), donated \$500,000, ensuring greater access to care for many more.

[Dr. Bill Kivlichan](#) committed \$75,000 to the Hugh MacKay Dental Emergency Bursary.

With her gift of \$25,000, [Dr. Valerie Stavro](#) created the Dr. Valerie Stavro Student Bursary in memory of her father, Chris Stavro.

In the past year, UofT Dentistry saw an increase of 164 donors from the previous year.

\$350K

Leadership
Annual Giving

493

No. of Donors

814

No. of Gifts Made
to the Faculty

\$110K

Sponsorships



03

INNOVATION

Across all areas of research and scholarship, UofT Dentistry consistently ranks among the world’s top destinations for dental education and research. With its multi-disciplinary and collaborative approach, Dentistry’s researchers are making important contributions to health scholarship and research.

The breadth and depth of UofT Dentistry’s research challenges the definition of “dental sciences.” From bio-absorbable polymers to DNA assembly for hard tissue regeneration; to new forms of wound healing and major contributions to the neuroscience of pain; and from breakthroughs in cancer invasion to breakthroughs in bacterial invasion, Dentistry’s researchers have taken to heart the concept that oral health is a component of overall health.

And it shows: UofT Dentistry was ranked #22 by the Shanghai Academic Ranking of World Universities in 2017, and in 2018 rose two spots, to the #20 position. The Shanghai system determines rankings based on four factors: quality of education; highly cited faculty; research output; and per capita performance.

The school was also ranked #42 in the world in the QS world rankings in the subject of Dentistry. These rankings are based on: academic peer review; faculty/student ratios; citations per faculty; and employer reputation. The school has climbed eight positions, from #50, since Dentistry became a subject ranking in this system in 2015.

Making The Grade

Benchmarking: National

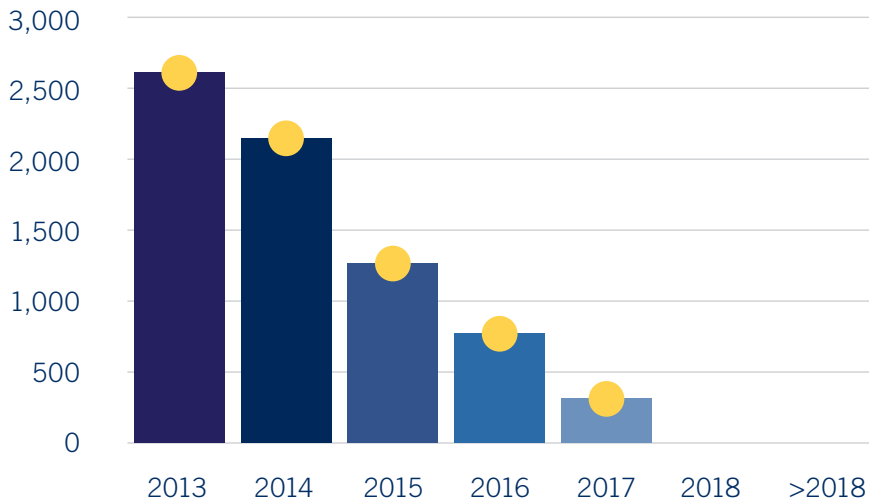
Scholarly Output among Canadian Dental Schools			
INSTITUTION	OVERALL	2017	2018
University of Toronto	113	73	40
University of Alberta	103	64	39
University of British Columbia	82	50	32
McGill University	69	45	24
Université de Montreal	29	19	10
Dalhousie University	28	21	7
University of Manitoba	21	15	6
Western University	21	13	8
Université Laval	18	15	3
University of Saskatchewan	10	6	4

Overall, UofT Dentistry’s scholarly output — the number of academic publications it produces — is extremely high. In the last two years alone, UofT Dentistry has produced more peer-reviewed publications than its peer institutions in Canada.

* Note: Data were collected from SciVal, and do not reflect non-Dentistry publications; collection extends from January 1 – December 31 for 2017, and for 2018, from January 1 – June 20.

The impact of our school's research is also far-reaching: over the past five years, UofT Dentistry has consistently marked the highest number of citations for publications in peer-reviewed journals compared to other Canadian dental schools.

Citation Count



7,050

Number of citations received by publications in the Faculty of Dentistry in the last five years

The overall citations count was derived from Scopus, and includes citations for publications by all faculty members in all types of scholarly publications

5-Year Citations: National Benchmarking Among Dental Schools

INSTITUTION	OVERALL RANK	TOTAL	2013	2014	2015	2016	2017	2018
University of Toronto	1	2652	1157	652	430	344	63	6
University of British Columbia	2	2395	1117	658	362	194	28	0
McGill University	3	1196	401	284	232	228	49	2
University of Alberta	4	1049	334	287	197	166	60	5
Dalhousie University	5	996	123	650	125	88	10	0
Western University	6	935	589	214	88	30	14	0
Université Laval	7	833	121	519	79	99	14	1
Université de Montreal	8	664	384	70	106	74	30	0
University of Manitoba	9	586	133	141	188	104	20	0
University of Saskatchewan	10	106	29	37	30	2	7	1

* Note: Data were collected from SciVal, and do not reflect non-Dentistry publications; collection extends from January 1 – December 31 for each year, except 2018, where it extends through June 28.



Benchmarking: International

UofT Dentistry’s publication output marks it as a top knowledge producer among its international peers. In fact, in a comparison of scholarly output over a five-year period against top peer schools such as Michigan, Harvard, and NYU, UofT ranks seventh — ahead of UCLA, the University of Florida, and the University of Iowa.

5-Year Scholarly Output: Benchmarking Against Leading U.S. Dental schools

INSTITUTION	OVERALL RANK	2013	2014	2015	2016	2017	2018
Harvard University	1	232	209	148	179	159	85
University of Michigan	2	197	221	153	168	145	86
New York University	3	150	150	156	172	139	66
University of Washington	4	168	102	139	128	109	43
University of North Carolina	5	130	118	117	106	111	44
University of Pennsylvania	6	112	75	69	93	80	62
University of Toronto	7	107	85	85	95	73	44
University of California at Los Angeles	8	105	61	88	90	86	42
University of Florida	9	126	64	76	72	79	36
University of Iowa	10	81	68	85	64	70	45
University of Minnesota	11	77	74	59	75	62	21
Columbia University	12	91	72	53	54	41	34
University of California at San Francisco	13	65	77	56	56	57	34

* Note: Data collection extends from January 1 – December 31 for each year, except 2018, where it extends only to July 1.

** Note: International publication data was retrieved from SciVal and does not include Dentistry’s non-dental (biomedical) scholarship.

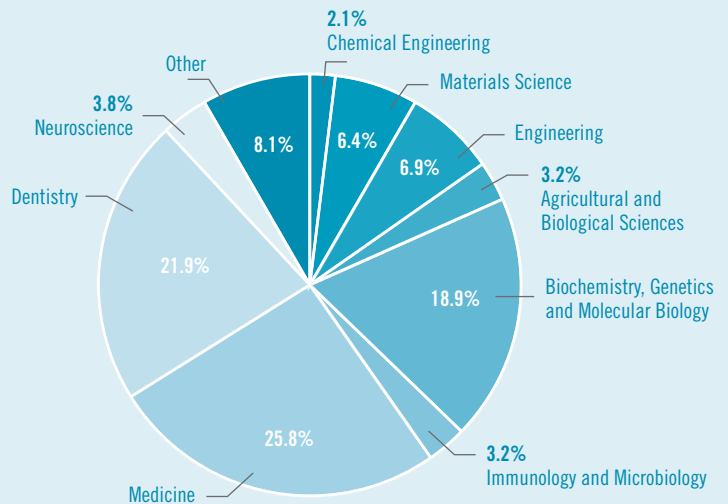
Making an Impact

42.9%

Forty-three percent of Dentistry's scholarship in the past five years appeared in the top 10 journals for dentistry (determined based on impact factor).

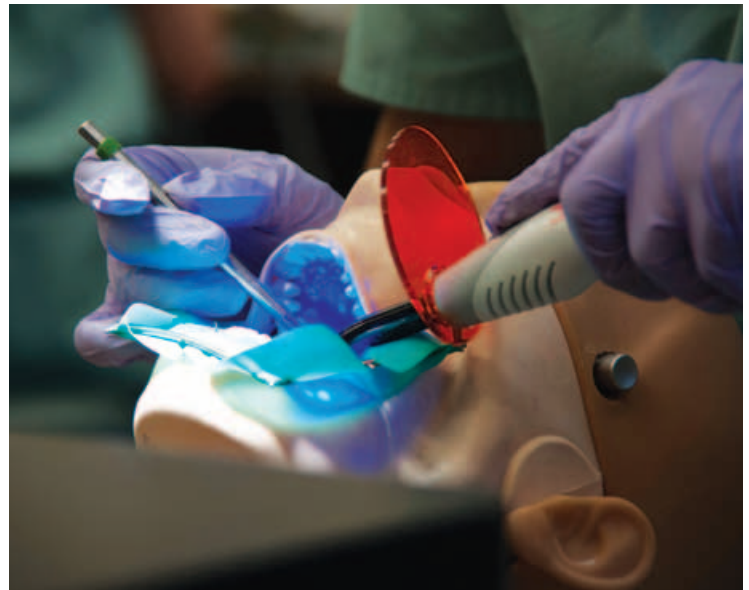
INTERDISCIPLINARY DEPTH

Publishing in areas as diverse as neuroscience, medicine, immunology, biochemistry, materials science, and engineering, UofT Dentistry demonstrates its unique interdisciplinary strength. Many of the Faculty's research papers do not appear in oral health-related journals; instead, they appear in top medical, engineering, and biomedical engineering journals, such as Nature Communications Biology.



UofT Dentistry’s research patterns stress the importance of international research partners in delivering high-impact scientific results.

Almost half of Dentistry’s publications over the past five years have been with international collaborators — 370 publications — which have resulted in 3,784 citations. UofT Dentistry’s international collaborations have remained consistent, and account for approximately 45% of the overall research programs over the past five years, demonstrating a remarkable research network.



Collaboration Impact: International Benchmarking

Among peer U.S. dentistry schools, UofT Dentistry ranks second for its collaborative impact of its research publications over a five-year period. Collaboration

impact is defined as the average number of citations received by publications that have international, national or institutional co-authorship.

INSTITUTION	COLLABORATION IMPACT							
	RANK	OVERALL AVERAGE	2013	2014	2015	2016	2017	2018
University of North Carolina	1	7.6	11.5	7.4	15.4	3.4	1.5	0.1
University of Toronto	2	7.1	14.5	7.1	6.2	4.5	0.5	0
University of California at San Francisco	3	6.6	9.3	4.8	23	3.5	0.9	0.3
University of Washington	4	6.3	9.5	5.5	13.2	3.3	0.8	0.1
University of Michigan	5	6	8.8	5.2	16.7	2.9	0.8	0.3
University of Iowa	6	6	13.5	12.2	4.5	2.4	0.7	0
University of Minnesota	7	5.6	8.8	8.4	7.5	2.2	2.6	0
New York University	8	5	12.2	6.8	3.3	3	1	0.2
Harvard University	9	4.8	8.3	6.9	5.6	2.8	1	0
University of Pennsylvania	10	4.7	7.3	3.9	10.6	2.6	0.9	0.1
University of Florida	11	4.4	6.1	9.4	4.4	2.2	1	0
University of California at Los Angeles	13	3.6	3.9	8.8	5.7	2.2	1	0
Columbia University	14	2.8	3.1	3.4	3.4	2.8	0.3	0.3

* Note: Data collection extends from January 1 – December 31 for each year, except 2018, where it extends only to July 1. Data were retrieved from SciVal.

80,747

Total citations for UofT Dentistry faculty in Scopus (since 1966).

5-Year Citations: International benchmarking

Along with its interdisciplinary approach to health research, UofT consistently ranks with excellence for the impact of its research. Among the highest-rated North American peer institutions, UofT Dentistry ranks sixth for overall citations count, and first for the percentage of its research published in top scientific journals.

INSTITUTION	RANK	OVERALL	CITATION COUNT					
			2013	2014	2015	2016	2017	2018
University of Michigan	1	6167	2137	1998	1320	566	125	21
Harvard University	2	5398	2040	1474	1072	630	174	8
University of Washington	3	5280	1755	1804	1131	429	159	2
New York University	4	4227	1766	1062	779	491	119	10
University of North Carolina	5	4180	1332	1478	846	388	130	6
University of Toronto	6	2699	1172	658	439	350	73	7
University of Minnesota	7	2599	739	1128	444	198	89	1
University of Pennsylvania	8	2449	816	726	529	275	88	15
University of California at Los Angeles	9	2315	671	884	482	189	86	3
University of Florida	10	2297	1158	502	368	190	74	5
University of California at San Francisco	11	2124	893	346	570	263	46	6
University of Iowa	12	1996	723	643	355	193	78	4
Columbia University	13	1491	673	274	302	192	45	5

* Note: Data collection extends from January 1 – December 31 for each year, except 2018, where they extend only to July 1; all data were collected from SciVal.

Publications in Top 10 Journal Percentiles – International (5-Year Data)

Over the past five years, UofT Dentistry researchers have published a greater percentage of their journal articles in the top 10% most cited dentistry journals compared to peer U.S. schools.

PERCENT OF JOURNAL ARTICLES PUBLISHED IN THE TOP 10% MOST CITED DENTISTRY JOURNALS								
INSTITUTION	RANK	OVERALL	2013	2014	2015	2016	2017	2018
University of Toronto	1	30	25.3	25.8	28	32.6	31.4	40
University of Michigan	2	29.5	25.2	30.6	33.8	25.5	25.2	40.7
University of Florida	3	26.3	33.7	26.8	25.4	9.1	29.5	35.1
University of Pennsylvania	4	24.8	24.6	32.2	32.2	15.7	22.8	26.2
University of North Carolina	5	24	17.1	24	26.5	23.5	27.5	29.5
University of California at San Francisco	6	23.8	10.4	25.6	27.7	25.5	21.1	37.1
Harvard University	7	21.5	18.4	23.8	21.8	21.4	21.4	22.7
University of Minnesota	8	21.5	18.8	22.9	32.1	20.9	13.1	23.8
University of California at Los Angeles	9	20.2	13.8	24	20.3	15.8	17.6	38.1
Columbia University	10	18.9	25.7	22.9	15.2	22	7.5	20.8
University of Washington	11	18.8	16.8	23.8	12.6	22	21.1	17.8
New York University	12	18.6	17.5	26.1	19.1	17.7	15.3	16.2
University of Iowa	13	16	12.9	18.2	11.5	19.6	20.6	12.8

* Note: Data collection extends from January 1 – December 31 for each year, except 2018, where they extend only to July 1. All data were collected from SciVal.

H-INDEX: Measuring Impact

H-Index is a metric of both the quantity and quality of a scientist's research output. The index is based on a list of publications and the number of citations these publications received. After 20 years of research, an H-Index of 20 is considered good; over 40 is outstanding, and 60 and above is truly exceptional.

Despite a growing cohort of junior faculty members, over 30% of UofT Dentistry's research-intensive faculty have an H-index of 20 or higher; 14.5% have an H-index of over 30; just under 10% have an H-index of greater than 40. The Faculty also houses two scientists whose impact can be deemed remarkable.

This list shows faculty members with H-indices of 20 or above.

H-INDEX					
Grace Bradley	25	Boris Hinz	46	Ze'ev Seltzer	29
Dennis Cvitkovitch	36	Anil Kishen	29	Barry Sessle	54
John Davies	41	Gajanan Kulkarni	21	Craig Simmons	35
Douglas Deporter	28	Herenia Lawrence	30	Laura Tam	21
Omar El-Mowafy	21	Morris Manolson	27	Howard Tenenbaum	36
Michael Glogauer	40	Christopher McCulloch	68		
Daniel Haas	24	Paul Santerre	40		

* Note: Data are derived from Scopus, and cover July 1, 2017 – June 30, 2018.

Making Connections

Collaboration is at the heart of scientific innovation. More than ever before, health researchers are recognizing the impact of interdisciplinary and team work — a course of action UofT Dentistry researchers have been pursuing for years.

HOW WIDESPREAD ARE COLLABORATIONS AT UOFT DENTISTRY?

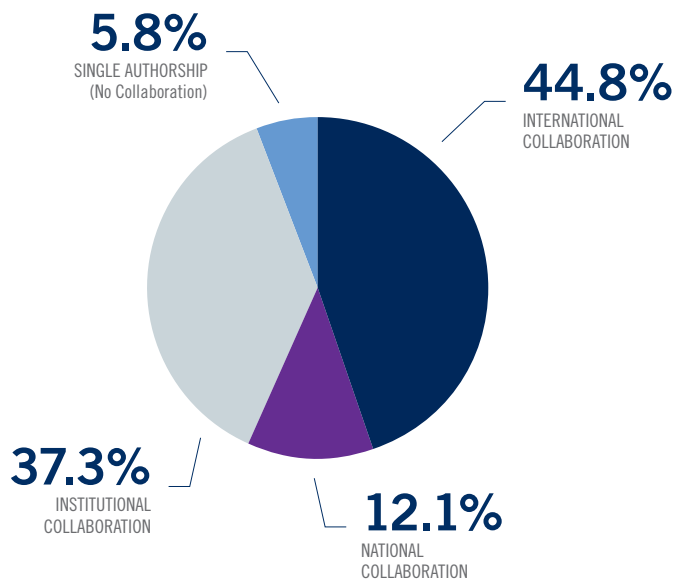
Dentistry's researchers on average held just under seven international collaborations each.

Year Range: 2013-2018

Data Source: Scopus, to June 15, 2018

COLLABORATION

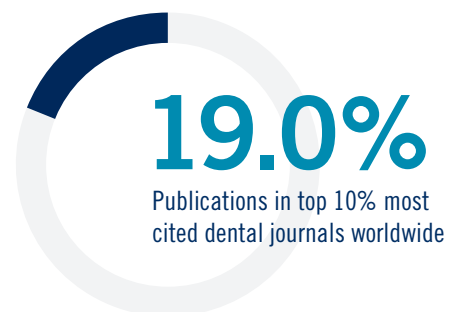
METRIC	PUBLICATIONS	CITATIONS	CITATIONS PER PUBLICATION	FIELD-WEIGHTED CITATION IMPACT
International Collaboration	370	3,784	10.2	1.57
National Collaboration	100	1,013	10.1	1.49
Institutional Collaboration	308	1,999	6.5	1.00
Single Authorship (No Collaboration)	48	254	5.3	1.12



INTERNATIONAL COLLABORATION SUMMARY



OUTPUTS IN TOP CITATION PERCENTILES SUMMARY





“ One hundred years later, that relationship of mutual respect and knowledge sharing is still evident, as UofT Dentistry establishes even more ties with its Chinese counterparts.”



Dentistry Lays Groundwork For Major International Collaborations

It was the early twentieth century when UofT Dentistry alum Ashley Lindsay (class of 1907) founded the West China School of Stomatology, the first of its kind in China. One hundred years later, that relationship of mutual respect and knowledge sharing is still evident, as UofT Dentistry establishes even more ties with its Chinese counterparts.

In November 2017, Daniel Haas, dean; Bernhard Ganss, vice dean, research; and Robert Carroll, assistant dean, continuing dental education; travelled to the West China School of Stomatology at Sichuan University (Chengdu), Zhejiang University (Hangzhou), Jiao Tong University (Shanghai) and Peking University (Beijing), where they met with school leaders to discuss formal collaborations for research and education.

Memoranda of Understanding (MOUs) were signed with both Sichuan and Zhejiang Universities. A delegation from Jiao Tong University visited the Faculty of Dentistry in the spring of 2018.

From Bench To Bedside: Commercializing Research Success

Among single-department faculties at the University of Toronto, Dentistry has the second highest number of invention disclosures and patents held by its faculty members. Over the past five years, faculty members have filed over 23 disclosures, and have been granted six patents.

The data, however, do not tell the whole story. Many of Dentistry's most prolific researchers have disclosures and patents with research groups across

UofT, spanning both national and international collaborations. A number of Dentistry's disclosures are therefore captured under other Faculty umbrellas, such as Applied Science and Engineering, Pharmacy, or Medicine.

Additionally, there were two licensing/option agreements negotiated over the past five years, again marking Dentistry as highly competitive.

One new company formed in 2018.

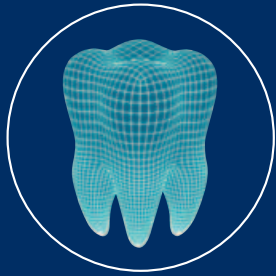
Invention Disclosures And Patents, Single Department Faculties (5-Year Data)

Disclosures	FY2014	FY2015	FY2016	FY2017	FY2018*	5 yr sum
Single Department Faculties	18.3	13.2	15.8	11.41	10.2	69.0
Dentistry	7.0	5.2	7.8		3.5	23.5
Forestry	5.3	2.0		1.7		9.0
Information		0.5	0.3			0.8
Kinesiology & Physical Education	1.0			0.7	1.0	2.7
Law		0.8				0.8
Nursing			1.0			1.0
Pharmacy	5.0	4.8	5.7	6.6	5.7	27.7
Public Health			1.0	1.5		2.5
Social Work				1.0		1.0

* Note: Data for FY2018 are preliminary and may change until finalized in 2019.

Patent Applications

Disclosures	FY2014	FY2015	FY2016	FY2017	FY2018*	5 yr sum
Single Department Faculties	3	5	8	3	4	23
Dentistry		2	1	1	2	6
Forestry	2					2
Information			1			1
Pharmacy	1	3	6	2	2	14



Class Of The Future: Mixed Reality Dental Anatomy



At the flick of a switch, a perfect, three-dimensional replica of an authentic human tooth, approximately 40 cm high, hovers in the air between a student and her teacher. Wearing a state-of-the-art HoloLens mask, the teacher swipes the air with her hand. The tooth divides in half, revealing dental pulp and canals. Suddenly the student — also wearing a HoloLens mask — is able to see the teacher's (real) finger pointing to an inflamed canal inside the tooth. With another flick of a finger, the student repositions the tooth, so that she can look more closely at the enamel wear on the other side of the tooth. This is the learning tool of the future, and it's being designed by UofT Dentistry professor Anuradha Prakki.

A set of goggles fitted with special HoloLenses allow the wearer to interact with and manipulate objects within her central vision, while still being able to see and access what lies outside the 3D imaging in her peripheral vision. The 3D dental anatomy images, crafted from CT scans of authentic human teeth, are controlled via an app that Prakki and her research team are building.

Prakki, who received support from the Faculty of Dentistry Dean's Endowment Fund to help her develop the programming, submitted an invention disclosure for the device in the fall of 2017. She also plans on launching the tool through a startup company, Iimersao ("immersion" from the Latin American root). Having completed the University of Toronto Early Stage Technology (UTEST) program, which helps researchers develop their intellectual property for market, Prakki plans to roll out the first official prototype in 2019.

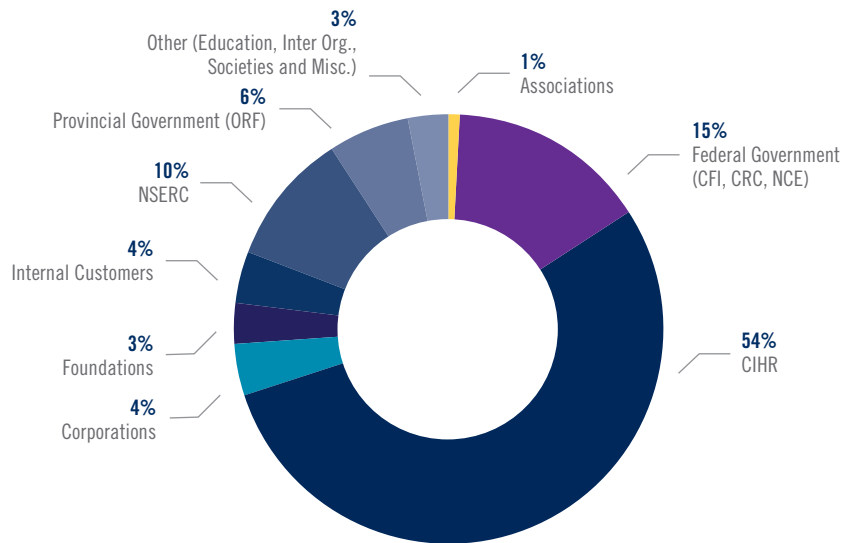
In future, says Prakki, "all pre-clinical disciplines might want to use the same technology. It's a game changer in terms of education." Prakki was honoured with the W.W. Wood Award for Excellence in Dental Education in 2017, and the Bruce Hord Master Teacher award in 2012-13.

“ All pre-clinical disciplines might want to use the same technology. It's a game changer in terms of education. ”

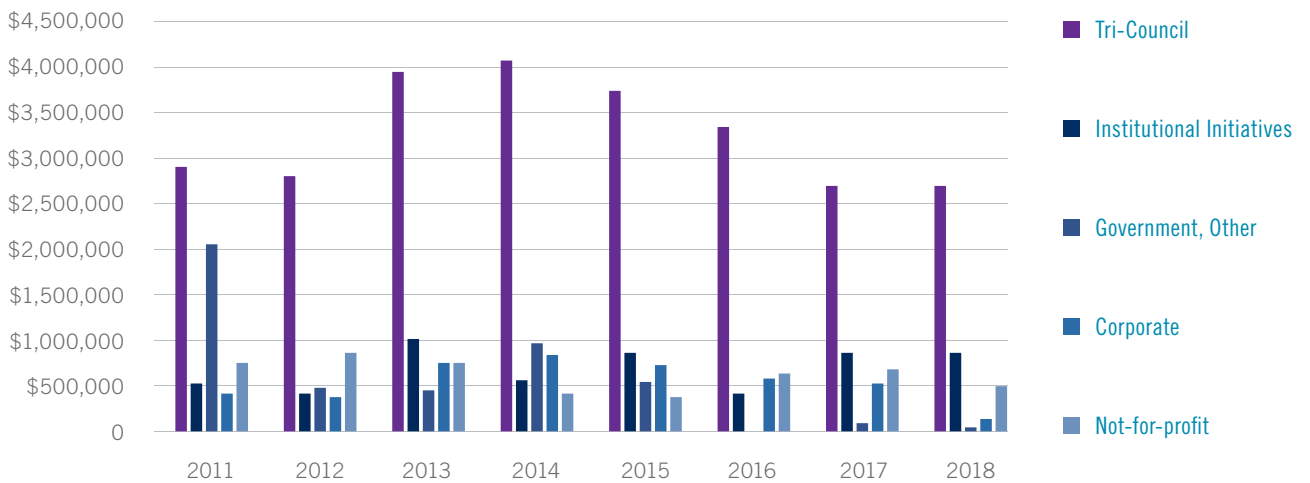
Record Research Funding

In an era of funding reductions from government agencies, researchers at the University of Toronto's Faculty of Dentistry have remained highly competitive, and have enjoyed banner success rates with research grant applications.

From April 2017 through March 2018, UofT Dentistry investigators secured \$4.3M in research funding. Of those funds, 54% (\$2.3M) were generated by the Canada Institutes for Health Research (CIHR). Total Tri-Council funding for the 2017-18 fiscal year was \$2.7M.



From 2011-2018, the University of Toronto's Faculty of Dentistry researchers have been awarded consistently between \$4M-6M dollars in annual research funds. Over that eight year period, UofT Dentistry received \$45.9M in total research funds. Over a five-year period, Dentistry research earned \$27.5M in grants.



Building Blocks Of The Future: DNA, Protein Self Assembly

There may be a way to coerce hard tissue to grow itself. So says Assistant Professor Karina Carneiro, who investigates hard tissue regeneration. In 2017, Carneiro was awarded a 5-year National Science and Engineering Research Council (NSERC) Discovery grant worth \$110,000 to further her work on synthetic protein and DNA scaffolds. The idea is that by building the right scaffold structure, and adding the right cues to the template, materials will organize themselves in such a way that biomineralization occurs. Carneiro, who was also awarded a



2017 University of Toronto Connaught New Researcher award, will continue her investigation via a collaborative research project with Lund University (Sweden), and UofT Dentistry's Vice-Dean, Research, Bernhard Ganss, the researcher behind the discovery of a unique protein, amelotin, which has been shown to play a crucial role in enamel regeneration.

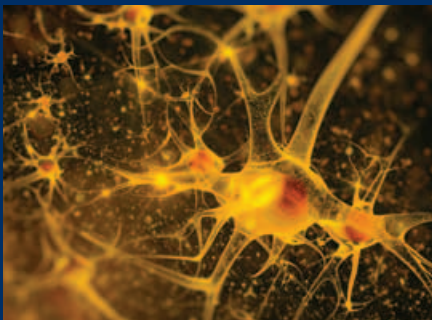


Does Pain Have Biomarkers?



Assistant Professor Massieh Moayed is on a hunt for the mechanisms — and possibly, the biomarkers — that produce pain. In 2017-18, Moayed was awarded an NSERC Discovery Award, worth \$170,000, to aid him in mapping out the network that controls pain. “I’ve found two brain regions that may talk to each other uniquely in pain compared to touch,” says Moayed, who is looking to pinpoint biomarkers for pain in both health and disease.

He also has related research projects on the go, including one that uses MRI technology to model differences in neuropathic (pain arising from damage to nerves) and musculoskeletal pain (pain in the joints and muscles). Another project, an international collaboration between Moayed, University College London and the University of Calgary, is trying to understand why up to 50 per cent of children with musculoskeletal pain don’t respond to treatment — and why two thirds of children who experience chronic pain will develop chronic pain as adults. The study will specifically examine children with pain in the joints and muscles, and compare them to children with neuropathic pain.





04

RENEWAL

Envisioning The Future

Guided by its five-year strategic plan, the Faculty of Dentistry at the University of Toronto has been undergoing a remarkable renaissance. From revitalizing its research space to reimagining its alumni programming and clinical operations, the Faculty is deeply invested in positive, goal-focused change to better support its academic mission.

Research Re-envisioned

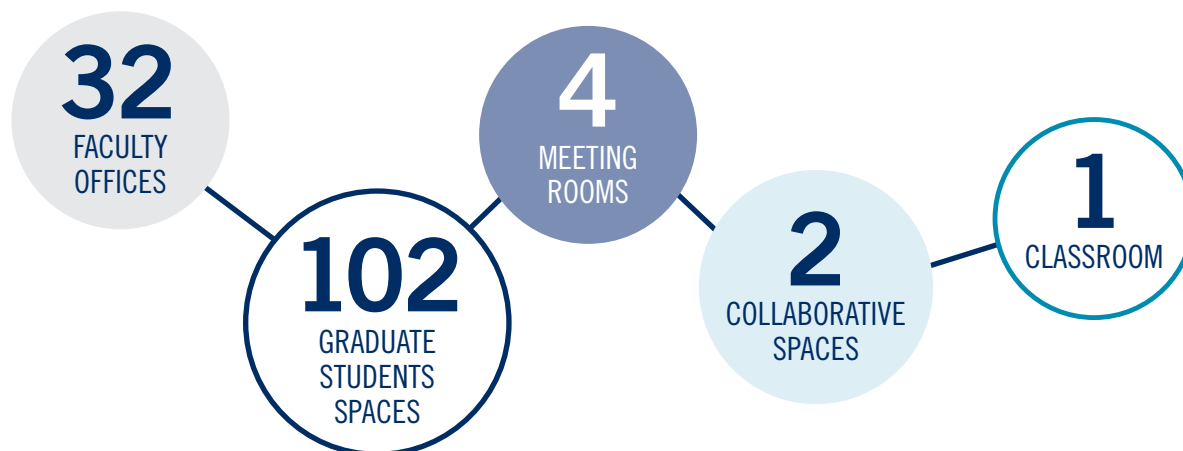
This spring, the Faculty of Dentistry completed a major renovation of its fourth and fifth floor research areas. This \$20M lab revitalization provides Dentistry's world-class researchers with all-new facilities. With the support of both the federal and provincial governments, the University of Toronto's Lab Innovation for Toronto (LIFT) project, and the Faculty of Dentistry, this 3,800 Net Assignable Square Metre (nasm) renovation wrapped up in the spring of 2018.

As well as facilitating the return of several of Dentistry's prolific researchers — whose labs, due to space constraints, had been housed in the century-old Fitzgerald building — the project met several other goals. The Faculty's research labs were mostly original to the building's construction in 1959 (with some added in the renovation in 1983); all were in urgent need of repair, and required retrofitting to meet current laboratory safety standards.

The design layout also supports a new vision for

Dentistry's research, which hinges upon the concept that ideas spark when scientists with different research programs work side-by-side. From previous dark, cramped rooms, the new labs are large, open and collaborative bench spaces — in fact, 95 small labs were reconfigured into 21 larger facilities with expanded usable space, which allows for the sharing of ideas as well as resources. Several common specialty labs, such as cell culture and microscopy, were created, and 12 new fume hoods were installed.

Other additions include: desk spaces for staff and students, glass-fronted faculty offices, meeting rooms and common areas. A classroom and hoteling areas for visiting researchers were also installed. One major design feature was to incorporate natural light through glass-paned faculty offices, a skylight in the fifth floor common area, and new windows installed along the exterior walls. Green technologies, such as LED motion sensor lights and sustainable materials, were used in every aspect of the design.





Clinic Renewal

Key to the Faculty of Dentistry's Strategic Plan 2014-19 has been the development of a clinic renewal plan. Over the past several years, senior leadership and a focused working group have consulted with experts, staff and faculty, with the aim of reimagining the Faculty's clinical spaces.

As the largest oral health teaching facility in Canada, with over 93,000 patient visits per year and spread out over three levels and two buildings, there are significant challenges to revitalizing UofT Dentistry's clinical operations. Operatories have been replaced or added, but there have been no significant renovations to the clinical infrastructure since the building's construction in 1959.

Curriculum

Teaching The Teachers

One realized goal from the Strategic Plan 2014-19 was the establishment of a program for teaching and learning, which was formally convened this year. Chaired by associate professor Laura Dempster and including part-time as well as full-time faculty members, the committee is tasked with helping faculty members further develop their teaching skills.

As part of that mandate, the committee commenced its first-ever Education Day, on June 21, 2018 at the Royal Canadian Military Institute. This half-day seminar for full-time faculty members included lectures from education experts Jana Lazor (Director of Faculty Development, Office of Faculty Development, MD Program) and Latika Nirula (Director, Simulation and Teaching Excellence, CAMH), as well as breakout sessions. Sessions were chaired by adjunct professor Jack Gerrow, assistant professor Eszter Somogyi-Ganss, and assistant professor David Cornell, with approximately 30 faculty members in attendance. In subsequent years, the Faculty hopes to revisit this successful program as a full-day event.

Teaching Tools

The Strategic Plan working group on education and curriculum has introduced and implemented new teaching tools and technologies into the classroom experience. One made its debut in the undergraduate didactic classes this year: Top Hat. This computer-driven program is an audience response system that promotes active learning within lectures. The program invites students to utilize their existing classroom technologies (such as their cell phones and laptops), to answer questions and take quizzes during the class, to ask questions, and to start debates. Other teaching technologies are also being considered.

Academic Year Changes

The fall of 2017 saw the implementation of important changes to the DDS 3 and DDS 4 academic years. As of the 2017-18 academic year, the DDS 3 summer session extends into late July. When this cohort enters DDS 4 in the 2018-19 academic year, they will subsequently complete their Comprehensive Care Program patients one month earlier, at the end of March.

The Faculty projects that, with these changes, there will be cascading positive effects for students as well as their patients. By ending a month early, fourth year students who require extra time for patient care experiences will have it.

The extra month at the end of year three allows DDS 3 students to carry out more prosthodontic procedures, which the previous schedule had made impractical. By starting their prosthodontic procedures earlier, these students are given the chance to accelerate and advance their clinical learning before the beginning of their final year.

Patients win, too: by extending the school year, patients have better continuity of care over the summer months.

Changes To The Admissions Process

UofT Dentistry's admissions and recruitment processes have been revised over the last academic year, with a focus on attracting and retaining top candidates. Part of that process involved changing the admission interview format. This year, the school adopted the MMI (multiple mini-interview) format, widely used by other Canadian health profession schools. The new format is thought to be more effective in helping the admissions committee members' ability to assess the non-cognitive skills of applicants.

There were also changes made to the overall experience of the day. Driven by feedback from our current students, the admissions interview day has become a chance to connect with faculty and students. Dean Daniel Haas was on hand to greet candidates, and the team of DDS student volunteers produced a slide show and presentations in a friendly and welcoming atmosphere.



Advancing Our Community

Changes To Alumni Programming

Over the 2017-18 academic year, the Office of Advancement completed a review of its programming — organized around principles of inclusivity, community and shared core values — to ensure that alumni, friends and donors feel the greatest sense of engagement with and by the Faculty.

The annual Gala has been streamlined into an Award of Distinction dinner, where the recipient is honoured for his or her contribution to the field of dentistry, the school and the wider community. The 2018 winner was Dr. James Leake (see: Awards & Recognitions).

A new event was also launched: the inaugural Great Alumni Event was held on April 27, 2018 at Steam Whistle Brewing. In its first year, the event welcomed over three hundred alumni from all graduating years, many of whom were in town to attend the Ontario Dental Association's annual spring meeting, and was attended by close to fifty event sponsors. The second Great Alumni Event will take place at Steam Whistle on May 10, 2019, once again during the timeframe of the ODA meeting.

The annual Faculty of Dentistry Alumni Association Annual General Meeting has also undergone a shift, with the addition of a CDE lecture. The annual fall meeting is open to all alumni, who are automatically voting members of the Alumni Association.

The Office of Advancement has also been striving to help students integrate into the professional community. The Student Vendor Fair has two dates during the year (November and March) where vendors meet with students in a relaxed tradeshow environment. Fifteen companies met with over 400 DDS students at the 2017-18 fairs.

While many facets of the alumni events and programming have been evolving to better suit the needs of the community, much of its popular programming has remained the same, including:

YOUNG ALUMNI MENTORING:

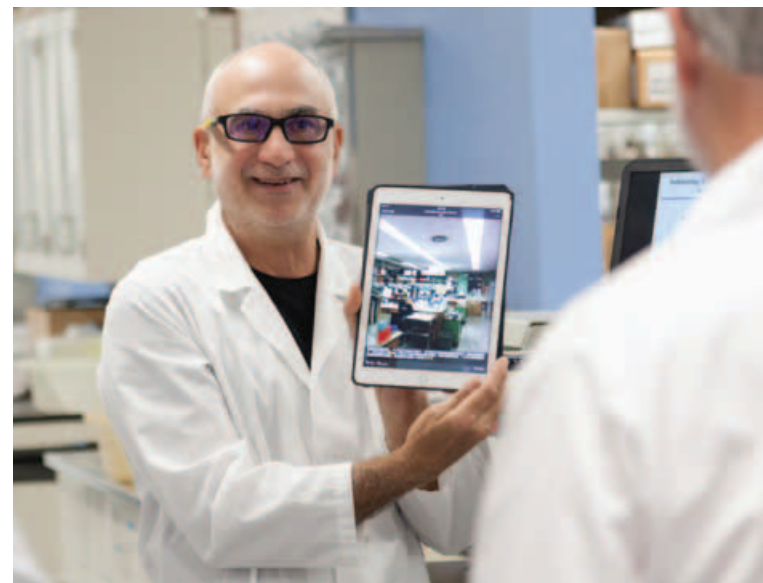
A discussion aimed at fourth year DDS students with a young alumnus (15 years out) on career expectations, challenges, and networking (spring).

RURAL DENTISTRY MENTORING LECTURE:

A lecture from an alumnus on the pros and cons of working in a rural area (fall).

UOFT DENTISTRY ALUMNI RECEPTION, PACIFIC DENTAL CONFERENCE:

A reception hosted by Dean Daniel Haas and Director of Advancement, Selina Esteves, at the annual University of British Columbia Pacific Dental Conference. This event is open to all alumni and friends (spring).





Academic Restructuring

Important changes to the UofT Dentistry academic leadership were implemented during the 2016-17 school year. Vice dean, education and vice dean, research positions were created, signalling the equal importance of education and research in supporting the academic mission of the school. Two positions, associate dean, undergraduate education, and associate dean, graduate education, were also created to support the vice dean portfolios, with a focus on those education programs.

Restructuring of academic divisions was likewise undertaken in answer to the Faculty's 2011 external review. This report stated that the discipline structure that had been in place led to a siloed culture at the school, and that it impeded our ability to be effective. With the hopes of facilitating a more holistic, collaborative learning and discovery environment,

and to better align the Faculty with its UofT designation as a single-department Faculty, these unit designations were eliminated. The graduate specialty programs, however, remain, as do their designated program heads.

With these changes fully integrated over the 2016-17 academic year, and as one of the 2014-19 Strategic Plan priorities, a review of the academic support structure was conducted. The first change took place with the creation of a new role: manager, academic administrative services. This person is dedicated to overseeing our academic administrators and reports to the vice dean, education. In March 2018, ten new administrative roles were phased in to better facilitate equitable and efficient support in a task-based, collaborative model that moves away from the siloes that had existed.

External Reviews

With the objective to continually strive to improve our mission, over the last 5 years, the Faculty has conducted a number of external reviews. In the 2017-18 academic year, the Continuing Dental Education program and the Faculty's clinical operations both underwent successful external reviews.

Continuing Dental Education

On February 5, 2018, a team of reviewers — H. Kendall Beacham, assistant dean, continuing dental education, College of Dentistry, NYU; Suzan Schneeweiss, associate dean continuing professional development, Faculty of Medicine, University of Toronto; Jim Lai, vice dean, education, Faculty of Dentistry, University of Toronto — convened at the Faculty of Dentistry to assess our Continuing Dental Education program. The purpose of the review was to consider the current structure, function and programming of the school's dental education program; to report on the findings as well as propose recommendations.

Many of this program's strengths were identified during the review, and the report noted the effectiveness of current director, Dr. Robert Carroll. Its recommendations included the suggestion of tapping into new international markets and engaging in strategic and succession planning for its leadership when that becomes necessary.

Clinical Operations Review

The structural organization, function and operations of the UofT Dentistry clinics were examined during a clinical operations review on April 16-17, 2018. Reviewers Lex MacNeil, professor and founding dean, College of Dental Medicine at Midwestern University in Illinois; Blaine Cleghorn, professor and assistant dean of clinics, Dalhousie University; and Jim Lai, vice dean, education, UofT Dentistry spoke with various stakeholders, including the director of the comprehensive care program, the directors of specialty programs, ITS and human resources.

The reviewers provided a wide range of suggestions for the Faculty to consider. The Faculty has struck an internal working group to build upon this work. This new group will assess the current organizational structure of clinical operations with a view to optimize patient care, teaching, the student experience and operational efficiency. Their objectives will also include the development and assessment of various models for improved organizational structure and the recommendation of a model that will enhance/strengthen patient care, teaching, the student experience and operational efficiency.





Strategic Plan 2014-19

The Strategic Plan, 2014-19 is reaching a new stage. From the original 21 priorities in 2014, we focused on just two in 2017-18. The Strategic Plan Implementation Committee will begin developing updates to the priorities in the Strategic Plan, which will be extended from 2019 through 2022.

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