



MAC IBIOMED

Annual Report

2022-23 ACADEMIC YEAR



iBioMed student
awards & achievements



Experiential learning,
co-op & careers



Innovation in iBioMed's
labs & spaces

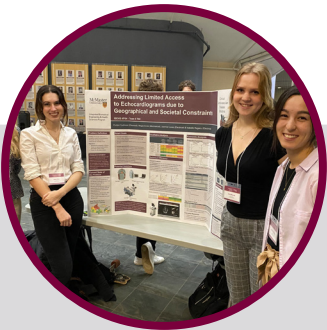


iBioMed
in Numbers



Celebrating
iBioMed grads

WHAT'S INSIDE!

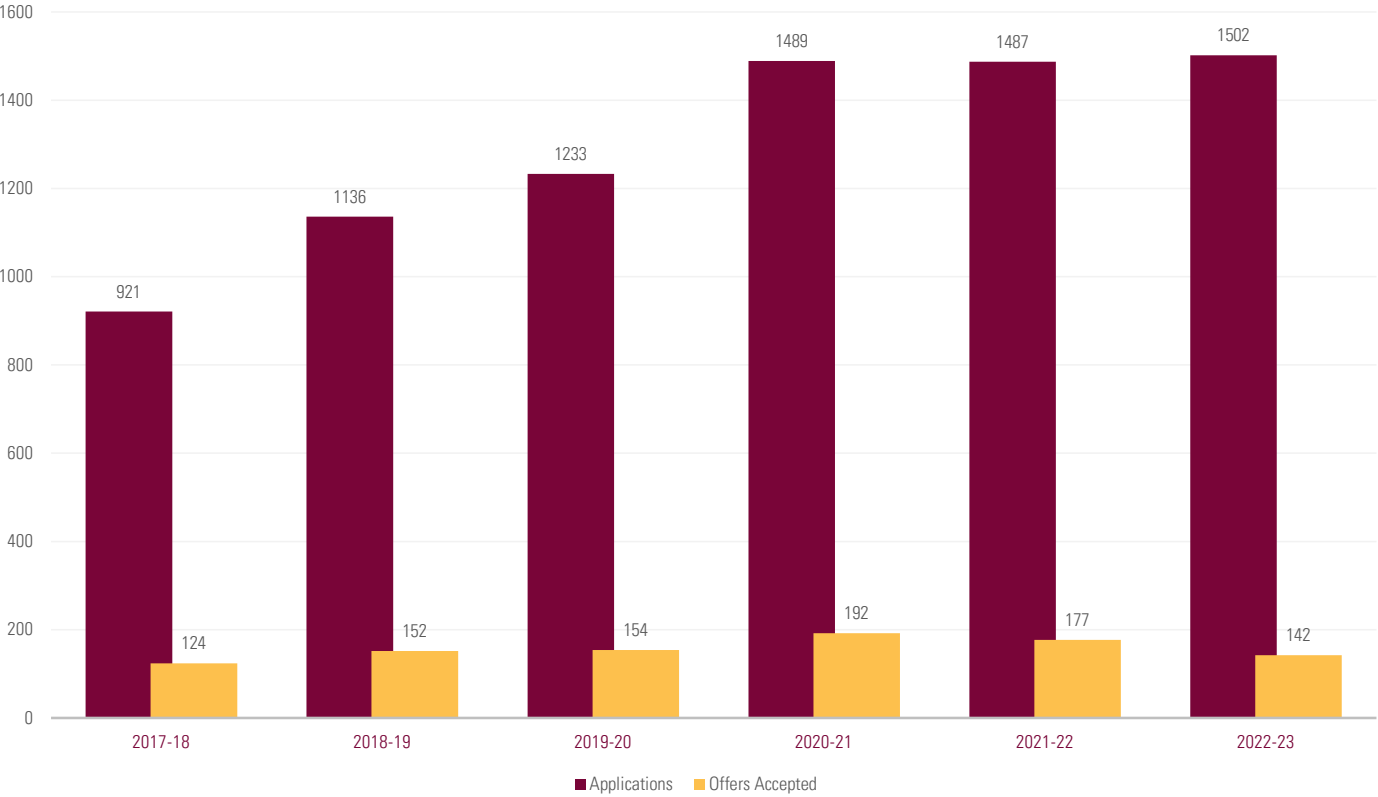


Health innovation
events & Showcases

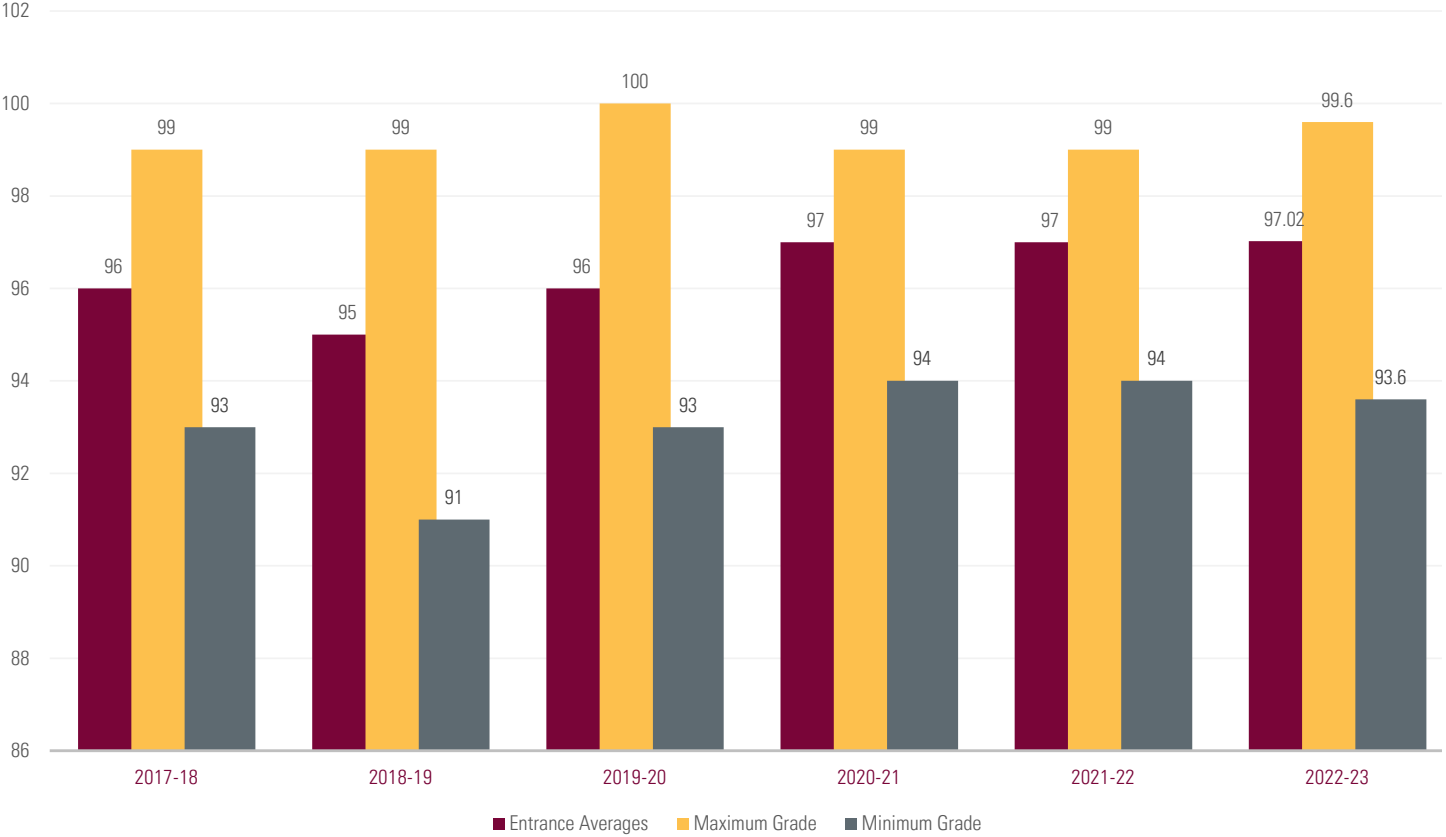
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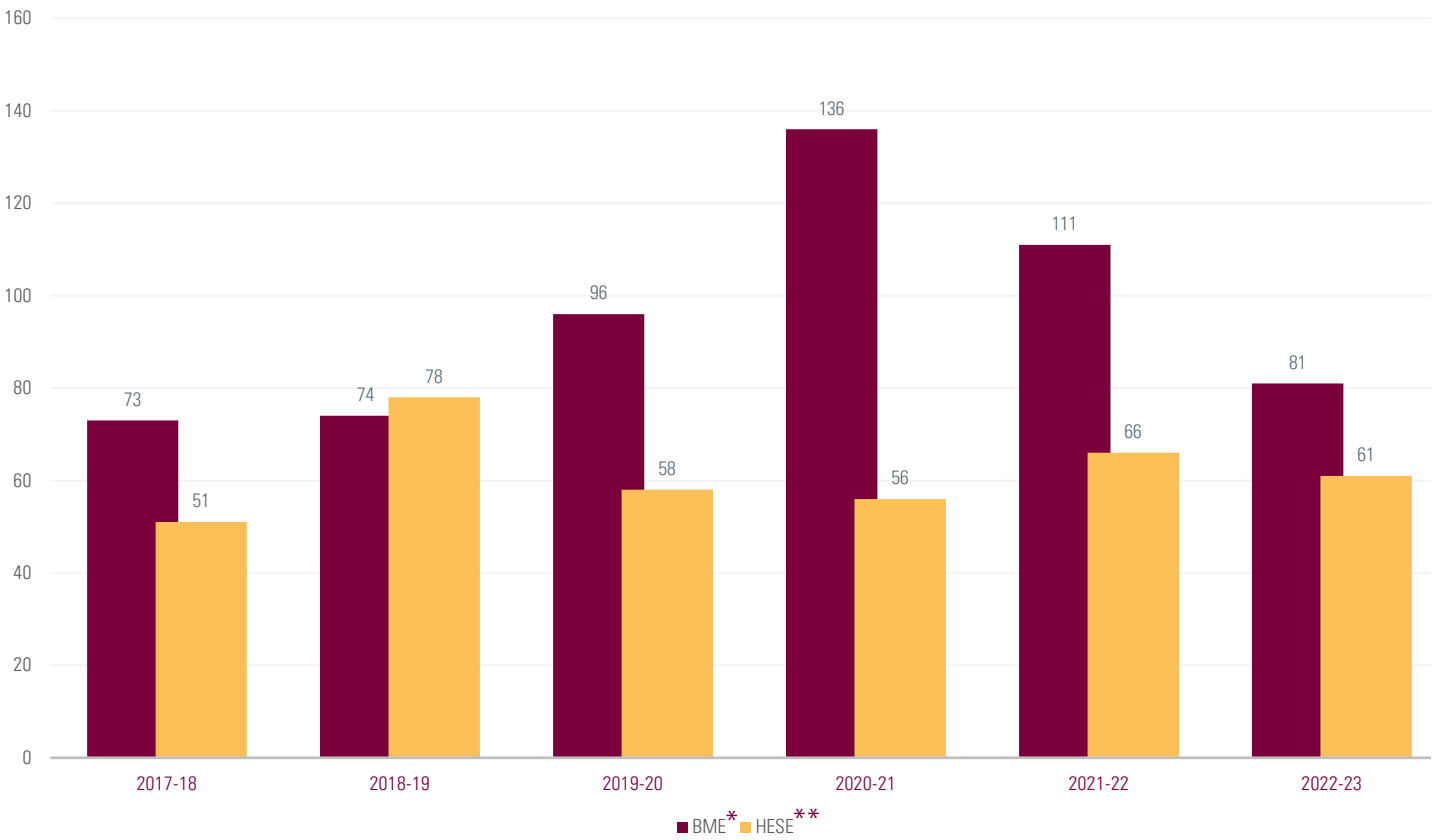
APPLICATIONS & ADMISSIONS



ENTRANCE AVERAGES

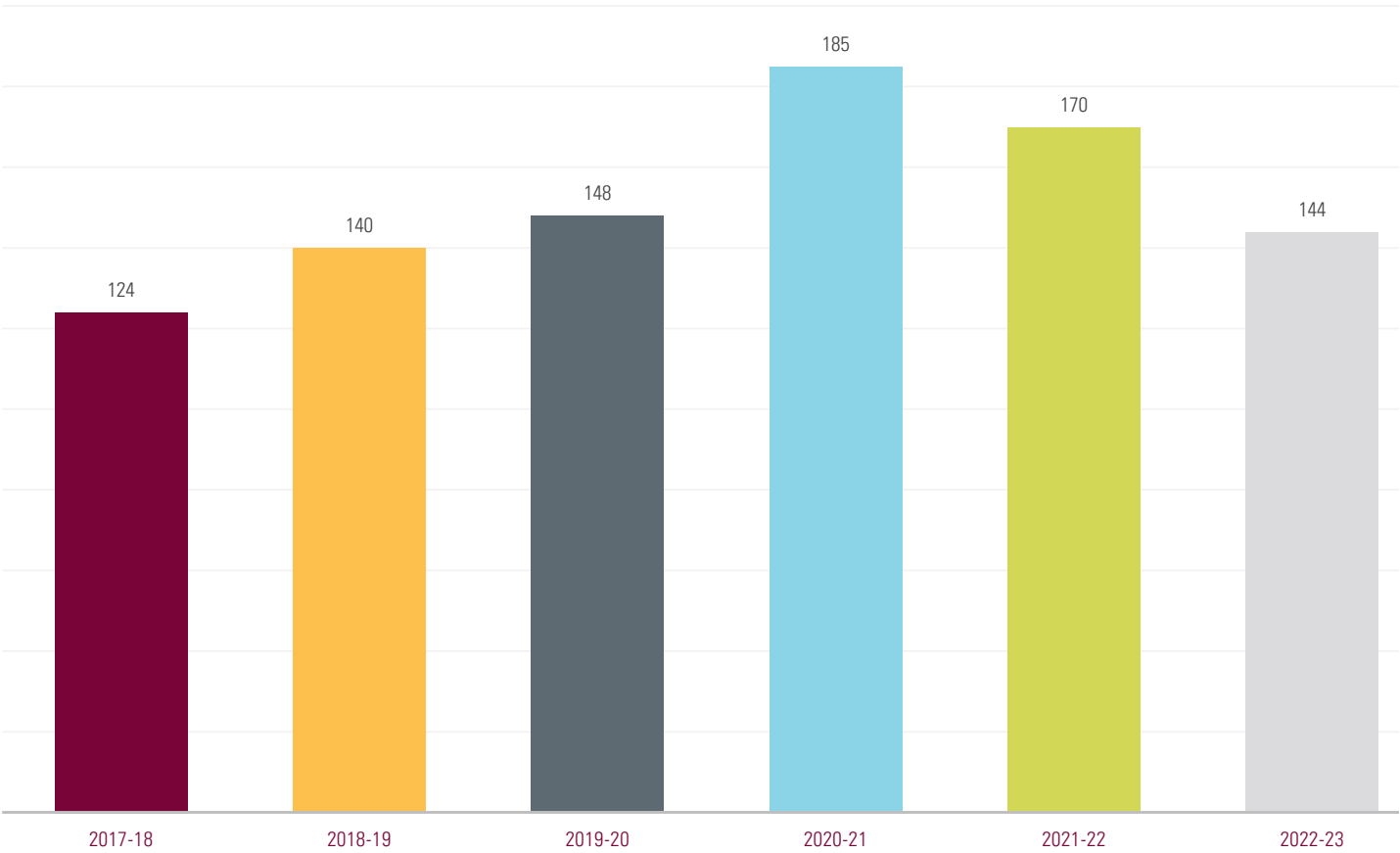


SUBJECT OF MAJOR INTEREST UPON ENTRANCE



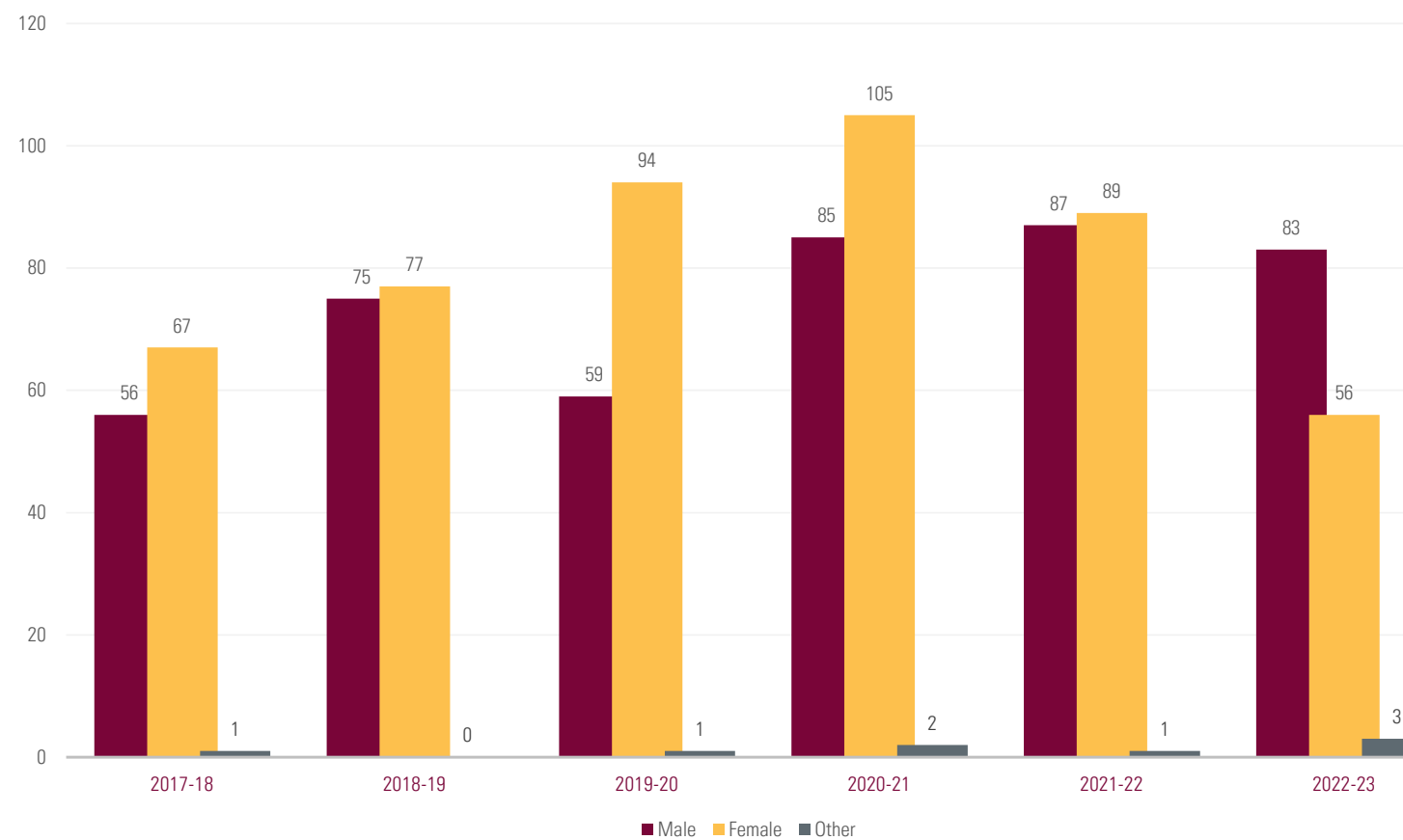
*Biomedical Engineering **Health, Engineering Science and Entrepreneurship

UNDERGRADUATE ENROLMENT HEADCOUNT

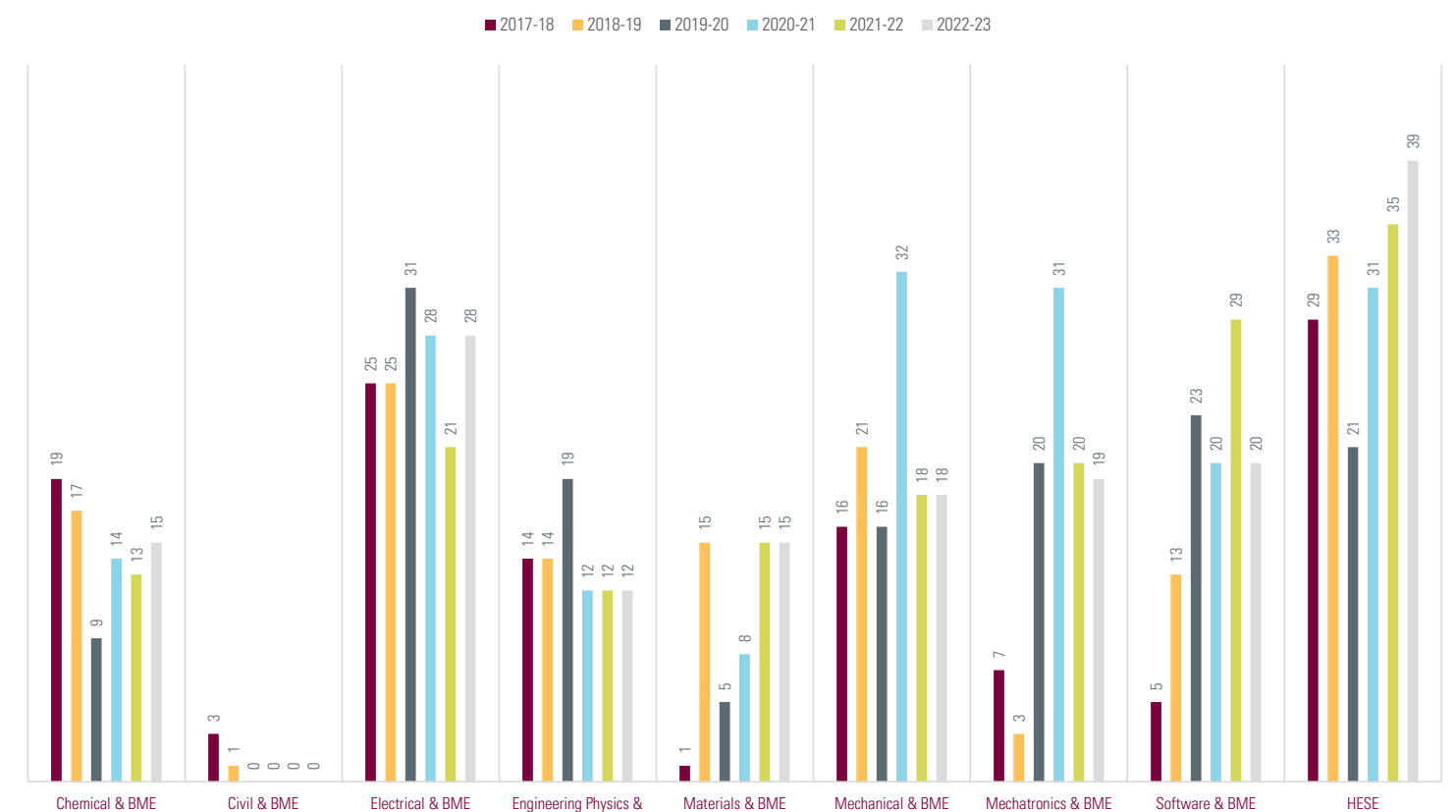


Data is based on the November 1st headcount

LEVEL I STUDENT GENDER RATIO AT ADMISSION

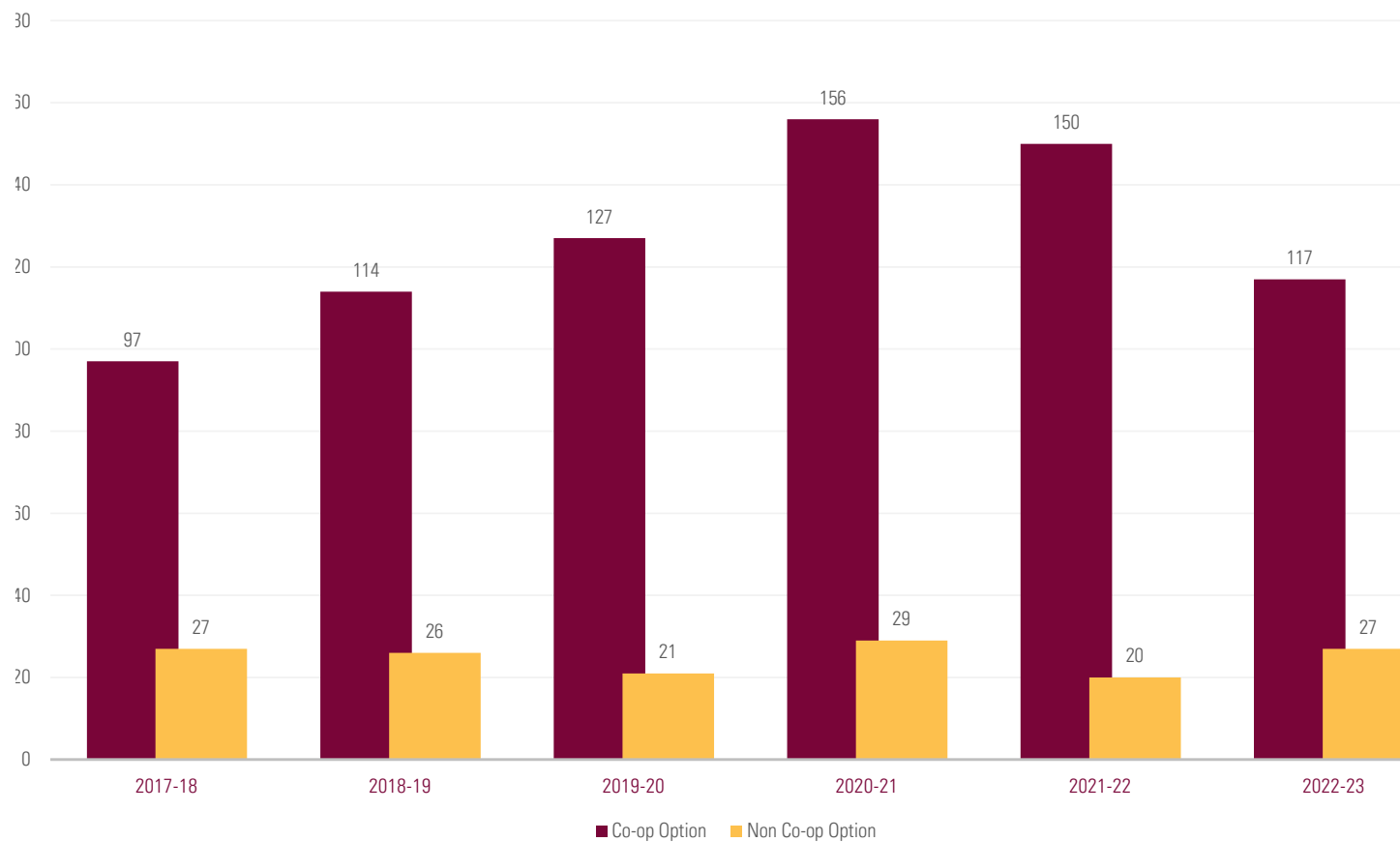


LEVEL II PROGRAM ALLOCATION BY COHORT



Data is based on June numbers at allocation deadline

LEVEL I CO-OP PROGRAM SELECTION



Data is based on the November 1st headcount

OVER 130 IBIOMED STUDENTS RECEIVED CO-OP PLACEMENTS DURING THE 2022-23 ACADEMIC YEAR!



EMPLOYMENT PARTNERS



JOB TITLES INCLUDE:

- AI Biomedical Research Engineer
- Deep Tissue Optical Imaging Co-op Student
- Research & Development Associate
- Data Analyst Intern
- Energy Management Co-op Student
- Business Development Intern
- Molecular Biology Intern

STUDENT ACHIEVEMENTS



BIG WIN FOR HESE HEALTH INNOVATORS

Level 5 HESE students won the People's Choice Poster Award at this year's McMaster Innovation Showcase. Their poster, "The Manipulable Endotracheal Tube," was designed as part of iBioMed's HESE course Innovators in Scrubs. The team later showcased their design and prototype at iBioMed's Final Showcase this past spring, and went on to receive several Leadership and Innovation Awards at iBioMed's Graduation Awards Reception. (pictured left to right: Hunter Csetri, Lily Shengjia Zhong, Emnpreet Bahra, and Esa Ahmad)



AWARD-WINNING TALK BY CHEM & BME STUDENT

Earlier this year, Sarah Arnold, level 3 Chemical & BME, attended the Canadian Chemical Engineering Conference in Vancouver where she participated in the Auld Student Paper Competition and won second place for her talk titled "Towards unravelling the phenomena of bacteria retention by microfiltration membranes." Sarah presented her 10-minute talk to a panel of judges from industry, government and academia. (Sarah, pictured centre, with the other award recipients)



MATERIALS & BME STUDENT FIRST-AUTHOR OF PAPER

Rebecca Sikkema, level 4 Materials & BME, published a paper as a first author in the journal "Applied Physics Reviews," which has an impact factor of 19.5. This paper was hand-picked by the journal's editors to be featured in the latest issue. The title is "Magnetic supercapacitors: charge storage mechanisms, magnetocapacitance and magnetoelectric phenomena."

"Throughout my journey, I was challenged to step out of my comfort zone. I was constantly surrounded by a supportive community of faculty, professors, and fellow students. I received guidance and mentorship that allowed me to grow personally and professionally."

HUNTER CSETRI, 2023 IBIOMED HESE GRADUATE



IBIOMED'S ENTREPRENEURSHIP EXPERIENCE AWARD

Deena Al-Sammak, Level 3 HESE, is the recipient of iBioMed's Entrepreneurship Experience Award (EEA). This award, valued at \$9,000, promotes entrepreneurship in equity-deserving groups in the HESE Specialization. Throughout summer 2023, Deena has been working with a mentor to develop her company HarmonEase Innovations, an assistive device for piano players who have limited hand mobility and finger dexterity.



DANIEL D'SOUZA DONATES TO IBIOMED PROGRAM

This past year, Daniel, Level 5 HESE, made his second donation to the iBioMed Program. Throughout his time with iBioMed, he has received several Teaching Assistant awards, and this past spring received the iBioMed Leadership Award at iBioMed's Graduation Awards Reception. This fall, Daniel will begin his Masters of Engineering in Biomanufacturing at McMaster.



YOUNG TRAILBLAZER AWARD FOR CHEM & BME STUDENT

Congratulations to Shayna Earle, level 4 Chemical & BME, on receiving The Young Trailblazer Award this year. This annual award is presented to a YWCA program participant for her abilities to lead and empower others. Shayna is also an accomplished researcher and Co-President of the McMaster Women in Engineering Society. This summer, Shayna delivered a Design Thinking workshop and mentored students during iBioMed's Design Like a Girl STEM event.



IBIOMED GRADS

IBIOMED GRADUATION AWARD RECIPIENTS

Esa Ahmad, HESE
(not pictured)

The iBioMed Innovation Award

Emnpreet Bahra, HESE
(pictured front row, middle)

The iBioMed Innovation Award

Om Bhatt, HESE
(pictured middle row, fourth from left)

The iBioMed Top Academic Award

Angel Cai, HESE
(pictured front row, far left)

The iBioMed Community Impact Award

Vibha Choudhary, HESE
(pictured middle row, second from left)

The iBioMed Top Academic Award

Hunter Csetri, HESE
(pictured middle row, third from left)

The iBioMed Innovation Award

Daniel D'Souza, HESE
(pictured middle row, far right)

The iBioMed Leadership Award

Eric Hillebrand, Mechatronics & BME
(not pictured)

The iBioMed Top Academic Award

Prerana Keerthi, Electrical & BME
(pictured front row, far right)

The iBioMed Top Academic Award

Faisal Khaleel, HESE
(pictured middle row, third from right)

The iBioMed Top Academic Award

Ivan Milkovich, HESE
(pictured back row left)

The iBioMed Top Academic Award

Hareshan Suntharalingam, HESE
(pictured middle row, second from right)

The iBioMed Top Academic Award

Lily Shengjia, HESE
(pictured front row, second from left)

The iBioMed Top Academic Award, The iBioMed Leadership Award, and the iBioMed Innovation Award

Also pictured:

Dr. Colin McDonald, iBioMed Co-Director, Engineering (far left), Dr. Michelle MacDonald, iBioMed Co-Director, Health Sciences (back row, second from right), Dr. Vince Leung, iBioMed Associate Director, Engineering (back row, far right), Dr. Anna Korol, iBioMed Associate Director, Health Sciences (front row, second from right)

WHAT'S NEXT FOR OUR 2023 GRADS

INDUSTRY



Consulting Analyst,
Healthcare Strategy Consulting, Deloitte
Production Engineer,
Sonele (medical device manufacturing)

GRAD STUDIES



Medical School,
University of Toronto
Graduate Studies,
Master of Biomedical Innovation,
McMaster University
Graduate Studies,
Master of Engineering in Biomanufacturing,
McMaster University
PhD Studies,
Max Planck - University of Toronto Centre for
Neural Science and Technology

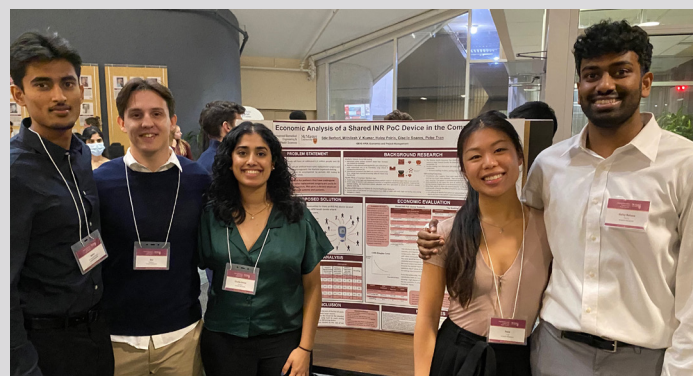


FAVOURITE IBIOMED MEMORY

My first neurosurgery placement for Innovators in Scrubs was an unforgettable experience! I became surrounded by cutting-edge medical equipment and a highly skilled surgical team.

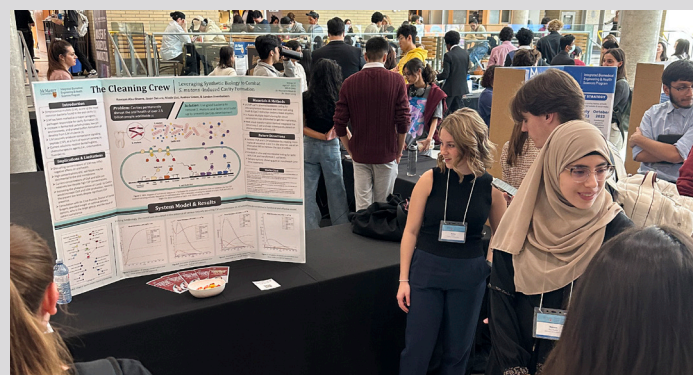
Emnpreet Bahra, 2023 iBioMed HESE Grad

IBIOMED EVENT HIGHLIGHTS



DESIGN SHOWCASES

Several iBioMed Design Showcases took place this year. These showcases highlighted student design projects from iBioMed's Health Solutions Design Project courses, including: IBEHS 1P10 Introduction to Engineering Fundamentals and Design, IBEHS 2P03 Introduction to Genetic Engineering, and IBEHS 4P04 Economics and Project Management. Some of this year's projects included "Addressing Limited Access to Echocardiograms due to Geographical and Societal Constraints" (4P04), "Leveraging Synthetic Biology to Combat Cavities" (2P03), and designing hip implants while being mentored by radiologists and studying real patient x-rays (1P10).



IBIOMED FINAL SHOWCASE

This event showcases standout student design projects from the entire school year. Projects from iBioMed's Health Solutions Design Project courses can be seen, as well as thesis and Capstone projects from fourth and fifth year students. Examples from this year included an award-winning thesis project titled "The Manipulable Endotracheal Tube," which was designed as part of iBioMed's HESE course Innovators in Scrubs. A group of second-year iBioMed students created Hydro Medical, an injectable hydrogel for chemotherapeutic drug delivery.



TECH HOURS

iBioMed was a sponsor for Tech Hours, a one-day tech event for high school students featuring a tech-a-thon and tech conference. Students design solutions to some of the world's biggest problems while gaining a foundation in technology, healthcare, entrepreneurship, and business. Project prompts ranged from good health and well-being to ending hunger, and climate action. Level 1 iBioMed student, Haaniya Ahmed (pictured right), delivered a presentation on her swimming brace for quadriplegic swimmers, a project from IBEHS 1P10. iBioMed student ambassadors also attended, and mentored groups while they worked on their designs.



GLOBAL ENTREPRENEURSHIP WEEK

iBioMed displayed its entrepreneurship spirit this past fall during Global Entrepreneurship Week. Its event, Professionals with Pizza, was a skill-share format event. iBioMed student guest speakers delivered presentations on topics including securing a co-op placement, how to approach a professor about research, how to network, and tips for developing a design portfolio. iBioMed students also spent time at The Forge's booth in McMaster's Student Centre. They displayed their research posters and shared design projects with students and visitors of the Student Centre.



DESIGN LIKE A GIRL

There was no shortage of innovation at this year's Design Like a Girl! Workshops included electronics and sensors, pitching and presenting, design thinking, Python, and state diagrams. Teams were mentored by upper-year iBioMed students, and on day two delivered their designs in a Dragon's Den format to a panel of iBioMed mentors. Examples of designs include the Vibe-Bite, a device that combats Bruxism or grinding of teeth; FairCare, an online platform that caters to patients experiencing various biases within healthcare; and a self-serve patient check-in kiosk in hospitals that helps alleviate pressure in understaffed healthcare facilities.



CONNECT




iBioMed CONNECT, a week-long skills-development workshop, gives incoming iBios a foundation in topics they'll encounter in their first year. During the first three days, students participated in workshops in Python and Raspberry Pi, productivity essentials, AutoCAD and 3D printing, and pitching and presenting. On days four and five, students participated in the iBioMed CONNECT hack-a-thon. Students worked in groups to tackle a real healthcare challenge and develop a solution that they presented to a panel of judges.



IBIOMED GRADUATION AWARDS & CONVOCATION

The iBioMed Program celebrated its second graduating class during the 2023 spring convocation. After the convocation ceremony, iBioMed hosted its own awards reception celebrating the recipients of the iBioMed Graduation Awards. Awards include the iBioMed Leadership Award, The iBioMed Innovation Award, The iBioMed Top Academic Award, and The iBioMed Community Impact Award. Visit page 15 of this report to learn more about our award winners!

IBIOMED DESIGN SPACES & LABS

 IBIOMED GENETIC ENGINEERING & TISSUE LAB	EQUIPMENT <ul style="list-style-type: none">• Bacterial incubator• Refrigerated micro centrifuge• Absorbance plate reader with micro-drop plate• Horizontal gel tanks (x3)• Electrophoresis power supplies (x2)• Spacious and well-lit location in HSC 4H13• Ongoing upgrades to accommodate tissue culture work
 IBIOMED INSTRUMENTATION & IMAGING LAB	<ul style="list-style-type: none">• Resonant's Ilumr – mini-MRI's (Medical Imaging Lab) (NEW for 2022-23)• Expansion of 3D Printers (NEW for 2022-23)• Swift and Zeiss optical Microscopes• Patient Simulators• Medical Instrumentation Development PCBs• National Instruments Data Acquisition Units (NI-DAQs)• Oscilloscopes• Digital Multimeters• Desktop optical CT scanners• Clarius Ultrasound scanners• Magritek's Terranova – mini-MRI• Cellscale's Univerts – desktop UTM devices• Quanser Robots – arms and terrestrial drones
 IBIOMED DESIGN STUDIO	<ul style="list-style-type: none">• Prusa MK4 3D Printers (NEW for 2022-23)• Formlabs SLA Printer that prints sterilizable material (NEW for 2022-23)• 3D scanner (NEW for 2022-23)• New Prusa MK3S+ 3D printers• Laser cutter (Trotec Speedy 100)• CNC / PCB Milling Machine (Bantam Tools Desktop CNC)

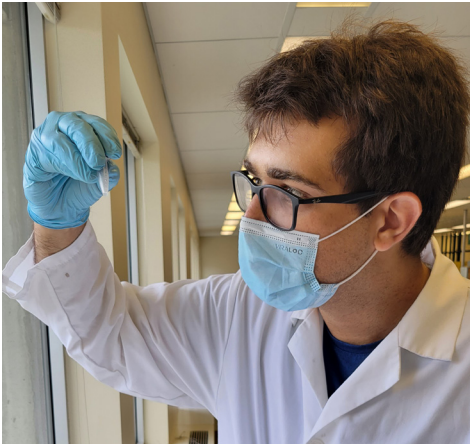
MEET IBIOMED'S TECH TEAM



PARM BOLA, INSTRUCTIONAL ASSISTANT,
iBioMed Design Studio



LEELA PILLI, LABORATORY TECHNICIAN,
iBioMed Instrumentation & Imaging Lab



ANDREJ RUSIN, LABORATORY TECHNICIAN,
iBioMed Genetic Engineering & Tissue Lab



"We dream big in iBioMed!" Students love working with the cutting-edge equipment. They use our spaces and equipment to design hip implants, wearable rehabilitation solutions, genetically engineered biological systems, and more. There are endless possibilities!"

Parm discusses his favourite aspects of iBioMed's spaces, and shares examples of student projects.

IBIOMED FAMILY UPDATES



DR. COLIN MCDONALD

Dr. McDonald has been appointed as Co-Director, iBioMed (Engineering). His five-year term commenced July 1st, 2023.



DR. ILANA BAYER

Dr. Bayer will be Acting Associate Director (Health Sciences) during the 2023-24 academic term.



LAURA KLYNE

Laura will be iBioMed's Program Manager until November 2024.

WHERE YOU CAN FIND US



<https://www.ibiomed.mcmaster.ca>



<https://www.facebook.com/MaciBioMed>



<https://www.youtube.com/channel/UCFu54PgzoKpZtyC5Tc9XbQg>



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