



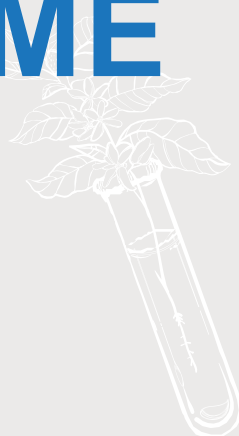
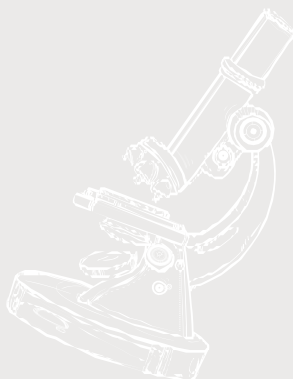
NANYANG
TECHNOLOGICAL
UNIVERSITY
SINGAPORE

School of Biological Sciences

GRADUATE PROGRAMME (BY RESEARCH)



www.sbs.ntu.edu.sg



SCHOOL OF BIOLOGICAL SCIENCES

At the School of Biological Sciences (SBS), we are committed to pioneering research that addresses some of the most pressing challenges in biology and biomedical science. Our research pillars serve as the foundation of our academic and scientific inquiry, guiding us in our quest to advance knowledge and drive innovation in both fundamental biology and applied science.

Our three key areas of focus - Development, Disease, and Target Discovery, Plant and Agrobiolology, and Structural and Cell Biology - are at the forefront of scientific exploration. These research pillars not only deepen our understanding of the natural world but also have the potential to revolutionise industries and improve human health.

Through cross-disciplinary collaboration and cutting-edge research, SBS is shaping the future of biological sciences. We are dedicated to leveraging the power of data science, state-of-the-art facilities, and strategic global partnerships to unlock new possibilities in science and medicine.



OUR RESEARCH

Development, Disease, and Target Discovery



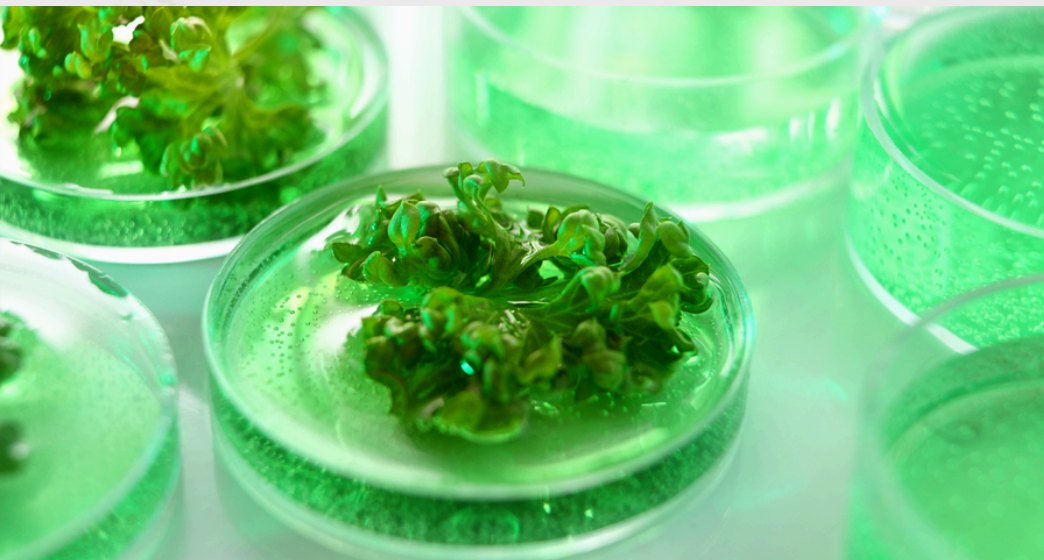
Bridging diverse areas of biomedical research, this pillar is focused on the molecular and cellular mechanisms that drive tissue development, homeostasis, and the onset of disease. Research within this pillar spans developmental biology, functional genetics, and mechanistic studies of pathogenesis, with scientists working to understand how dysregulated signaling cascades, epigenetic and gene expression changes, and protein interaction networks alter normal physiology and lead to conditions such as cancer, neurodegeneration, infectious diseases, and metabolic disorders. A key driver of these efforts is the recognition that new targets for the design of diagnostic tools and potent therapeutic agents are urgently needed, which depends on a deep understanding of how biological macromolecules orchestrate translation, expression, signaling, and core metabolic processes in both healthy and pathogenic cells. Our groups integrate developmental models with disease systems to map these processes in detail, providing new insights into the biology of disease progression and cellular maladaptation.

A distinctive strength of this pillar is its focus on translating mechanistic insights into actionable therapeutic strategies. Researchers employ medicinal and molecular chemistry approaches to identify, design, and optimize small molecules, degraders, biologics such as nucleic acids and proteins, and other therapeutic modalities as potential interventions. In addition, AI-powered platforms integrating computational chemistry, machine learning, and structural biology accelerate pre-clinical drug discovery. The interdisciplinary nature of this pillar enables the discovery of fundamental mechanisms and their application to therapeutic development, forming a strong platform for translating discoveries into new diagnostic devices as well as stimulatory and inhibitory agents.

Collaborative efforts with clinical and translational partners in Singapore and overseas ensure access to disease relevant models, patient derived data, and shared infrastructure for compound design and validation. This pillar benefits from access to chemistry and pharmacology facilities, tissue culture suites, and shared molecular characterization platforms, creating a rich environment for discovery. Through these integrated efforts, the Development, Disease, and Target Discovery pillar contributes directly to the advancement of precision medicine and the development of next generation therapeutics.

Plant and Agrobiology

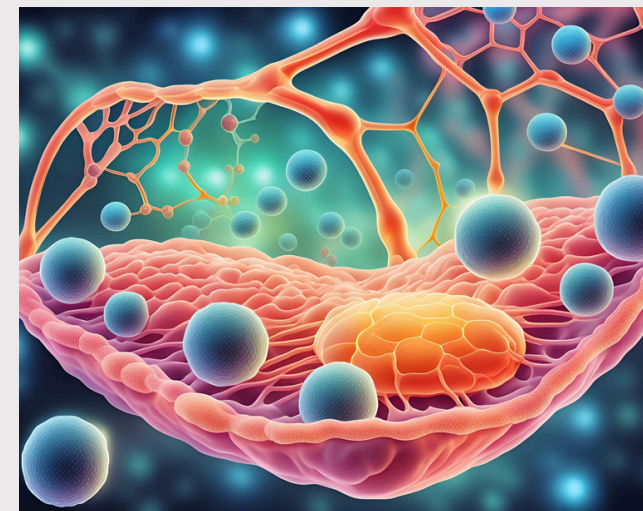
Centered on plant science innovation, this pillar integrates a vibrant community of scientists dedicated to advancing our understanding of plant (and fungal) systems to address pressing challenges in agriculture, forestry and food security. Researchers in this pillar study plant biotic and abiotic signaling for resilience, photosynthesis, and nutrient storage during development, as well as ecosystem genomics by integrating interdisciplinary technologies such as single-cell sequencing, single-molecule biophysics, super-resolution imaging, structural biology, population genetics, machine learning, and systems biology. Our teams investigate a wide spectrum of species, leveraging genetic and molecular insights to identify traits that drive productivity and resilience. Research groups within this pillar employ quantitative biology, synthetic protein engineering, AI-aided de novo design, CRISPR-based genome editing, and emerging concepts in plant molecular biology, including biomolecular condensation, to deepen our understanding of how plants respond to biotic and abiotic stresses.



Through in-depth research on genome evolution, photosynthetic efficiency, dynamic transcriptional regulation, and biomolecular assembly in developmental and signaling processes, we collaborate with top agricultural and forestry research institutes and industry partners both locally and internationally. These partnerships ensure our discoveries are translated into sustainable agricultural solutions. Our researchers are supported by precision-controlled walk-in growth chambers, cutting-edge structural biology approaches, state-of-the-art plant cell biology imaging facilities, and advanced genomic analysis pipelines, enabling us to remain at the forefront of plant science innovation.

Structural and Cell Biology

The Structural and Cell Biology pillar cultivates an active network of scientists, engineers, and trainees with expertise in molecular mechanisms, cell organization, and the complex interactions that sustain life at the cellular level. Researchers in this pillar tackle fundamental questions of how proteins, nucleic acids, and macromolecular complexes are assembled, regulated, and remodeled to drive essential cellular processes. Areas of focus include membrane protein structure, intracellular trafficking, cytoskeletal dynamics, and structural transitions that underpin signal transduction and cellular responses to stress.



SBS has been a pioneer in Singapore's structural biology landscape, establishing a dedicated Cryo Electron Microscopy (Cryo EM) facility, and among the first to implement next generation high throughput microscopes and sample preparation pipelines that enable single particle and cryo electron tomography (cryo ET) structural studies at near atomic resolution. By integrating these cutting edge imaging platforms with biochemical, genetic, and computational approaches alongside cryo ET, cryo EM, X ray crystallography, super resolution and live cell imaging, and advanced structural modeling, our research programs deliver high resolution insights that advance understanding of the molecular basis of cellular function.

This pillar fosters strong collaborations with leading structural biology centers and biomedical institutes across Singapore and worldwide, ensuring that the latest methods and technologies are applied to our research. These programs not only expand fundamental knowledge in cell and structural biology but also provide a foundation for novel therapeutic strategies and biotechnological applications, creating a dynamic environment for students, postdoctoral fellows, and collaborators to thrive.

Find out more about our research groups



ALUMNI TESTIMONIALS



ASSISTANT PROFESSOR
LOH JIA TONG

Ph.D, Biological Sciences, 2017

“My PhD journey at SBS was a transformative experience – both professionally and personally. SBS has brought together leading academics from all over the world to nurture excellence in students, ensuring that everyone can thrive and grow to achieve their full potential. Together with their state-of-the-art research facilities, students can push the boundaries of science with their world-class research. Their interdisciplinary research community further allows students to focus on one field while being exposed to other areas of science at the same time. The rigorous training I received at SBS certainly prepared me for the next stage of my research career. Moreover, the close, collaborative, and inclusive relationships with peers and faculties make SBS feel like home. The incredible people you meet here will provide you with lifelong support even after you graduate.”



ASSISTANT PROFESSOR
SANDIP BASAK

Ph.D, Biological Sciences, 2014

“Due to my background in pharmacy, I had a strong grasp of medicine formulation but limited experience in drug discovery. I was fortunate to pursue my PhD at the prestigious School of Biological Sciences, NTU, which is equipped with state-of-the-art facilities and staffed by exceptionally knowledgeable and passionate scientists. The rigorous coursework and academic programs ensure that graduates are highly competitive in the job market. This became particularly evident when I received a post-doctoral offer from NIH, USA, shortly after completing my PhD. I realized that the extensive academic training I received allowed me to excel and surpass many of my peers. This is reflected in my post-doctoral work, which has been published in renowned journals such as Nature, Nature Communications, and eLife. I must acknowledge that the diverse international community, cutting-edge technology, and, most importantly, the collaboration with dedicated and enthusiastic scientists have been pivotal in shaping my journey as a researcher.”



ASSOCIATE PROFESSOR
WU BIN

Ph.D, Biological Sciences, 2010

“Looking back at my days in SBS, I am very grateful that I made the right decision to continue my Masters and Doctorate at SBS. The world-class faculty members are exciting and energetic combined with the enriching atmosphere of openness gave a unique research synergy within NTU. As a PhD student, I received good guidance from my direct supervisor and many esteemed Professors and mentors in interdisciplinary fields. The accumulation of trainings and opportunities I gained proved to be

“I was able to seamlessly integrate and begin my new research project thanks to the experience and exposure I obtained throughout my years at SBS.”

critical in my success as a researcher. This was apparent when I started my post-doctorate research at Harvard Medical School in Boston. I was able to seamlessly integrate and begin my new research project thanks to the experience and exposure I obtained throughout my years at SBS. I must say, the international community, well-equipped technology and most importantly the company of passionate scientists played an instrumental role in my journey as a researcher.”

GENERAL ADMISSION REQUIREMENTS

- A good B.Sc. (Hons) degree or equivalent, and the ability to pursue research in the candidate's proposed field of advanced study.
- Good TOEFL or IELTS (for international applicants whose native language is not English).

FULL-TIME CANDIDATURE

PROGRAMMES	MINIMUM	MAXIMUM
Doctor of Philosophy	2 years	5 years
Master of Science	1 year	3 years

PART-TIME CANDIDATURE

PROGRAMMES	MINIMUM	MAXIMUM
Doctor of Philosophy	3 years	5 years
Master of Science	1 year	3 years

INTAKE

Admission is in August and January each year.
Please submit your application before the deadline for each intake.

Deadline for August Intake is 31st January
Deadline for January intake is 31st July.

Apply for admission [HERE](#)

“Inspiring dreams, developing skills and confidence, celebrating talents and passions, touching lives and engaging excellence as we together discover science and achieve goals and ambitions – this is the College of Science!”

GRADUATE COURSEWORK

Graduate coursework forms the basis of the intensive preparation for research work. Students are required to attend classes and pass the examinations in a certain number of graduate courses.

Selection of courses is made after consultation with the research supervisor.

The Academic Unit (AU) requirements for the degrees are as follows:

- M.Sc. - 10 AUs (6 AUs prescribed electives / 4 AUs critical literacy)
- Ph.D. - 20 AUs (12 AUs prescribed electives / 8 AUs critical literacy)

Exemption of courses may be granted by the Chair of the School if the candidate is deemed to have already done sufficient coursework in relevant areas in a Master's degree program at a recognized university.

THESIS SUBMISSION

Students are required to submit a thesis in a form ready and acceptable for examination before the expiry of their maximum candidature.

For M.Sc. - Oral defense of the thesis may not be required.

For Ph.D. - An open seminar and oral defense of the thesis are necessary.



TRANSFERABLE SKILLS PROGRAMME

[CoS Research Integrity Workshop](#) (core, half annually in October)

The workshop is organised for CoS PhD students in efforts to uphold the highest standards of ethics and integrity in research endeavours.

YOUNG SBS SCIENTIST SEMINAR SERIES

The seminar series is organised for final year student to learn how to prepare a scientific presentation and present the research project to experts and non-experts.

FREQUENTLY ASKED QUESTIONS (FAQ):

[How many courses am I required to take?](#)

- M.Sc. - 10 AUs (6 AUs prescribed electives / 4 AUs critical literacy)
- Ph.D. - 20 AUs (12 AUs prescribed electives / 8 AUs critical literacy)

[Can I go through a lab rotation programme before making a final decision on the lab to conduct my research?](#)

We do not offer lab rotation because the duration of Ph.D. scholarship support is only 4 years. We highly encourage our new graduate students to meet and discuss with SBS faculty members before formalizing the mentorship. Students may formalize their lab of choice within the first month of the graduate programme.

[Do I need to identify a laboratory and/or a specific research project before applying to the Ph.D. programme?](#)

No, there is no need to identify a supervisor or project before applying. Applicants are encouraged to look at our website to find out more about the research done at our school. In general, the scholarships are offered to the candidates. They may select their supervisors/labs based on their research interest. The school will consider the availability of positions in the labs and the funding situation of the supervisors before giving the final approval.

[Am I required to teach during the graduate programme?](#)

Yes. Participation as teaching assistant is part of the training for our graduate students. Therefore, there is a minimum number of teaching hours that must be fulfilled by all graduate students.

[Would I be offered housing on NTU campus?](#)

NTU offers student housing on campus. You can find more information [HERE](#)

SCHOOL OF BIOLOGICAL SCIENCES

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<http://www.ntu.edu.sg/sbs>