

SINGAPORE GRADUATE PROGRAMME IN NEUROSCIENCE (SGPN)

PREAMBLE

Understanding how our brain functions and how to maintain or enhance that function are key goals of neuroscience. Neuroscience, the scientific study of the nervous systems, is a major theme in biological and biomedical sciences. The Singapore Biomedical Research Initiative has identified Neuroscience as a strategic research area on which to focus. This is understandable given our rapidly aging population and the associated increase in socio-economic and healthcare burdens of age-related brain diseases.

By linking up investigators from across Singapore through the SGPN, we could achieve a critical mass to provide a broad-based education in neuroscience. Importantly, for this programme to produce a new generation of neuroscientists, we take a long-term view to expand and refresh the scope of the programme by continually monitoring the development of innovative neuroscience-related research within Singapore and the rest of the world. Such research areas could include interfaces between neural and cognitive functions which will require the coalescence of multidisciplinary knowledge and expertise including computer science and robotics/nanotechnology, interactive digital media, and emerging behavioral disciplines in the social sciences.

GOALS AND OBJECTIVES

The primary aim of the SGPN is the training of doctoral students for independent research and teaching in neuroscience, with the view to promote and enhance neuroscience research and education in Singapore, as well as to fulfill increasing demand for research manpower in the neurosciences by academic and commercial institutions. The SGPN provides a much awaited option for students to select in-depth training with a sharp focus in neuroscience. The SGPN would encourage communication among groups of neuroscientists in different places and will bring them together and establish a unified sense of purpose.

The SGPN aims to attract the top-level students from various disciplines and backgrounds such as the Biomedical Sciences, Engineering, Physics, Computer Science, and Psychology. The range of coursework will cater to different needs and aspirations and will enable cross-disciplinary interactions and cross-fertilization of ideas. Our objective is to nurture well-rounded and creative individuals who are committed and passionate in their intellectual pursuits and scholarship.

Steering Committee comprising representatives from participating Institutions

Steering Committee Representatives:

- Prof Tom Fox, Chairman
Deputy Executive Director, NGS
- Prof Dale Purves
Executive Director, Neuroscience Research Programme (A*STAR, Biopolis)
Director, Neurobiology and Behavioral Disorders Program, Duke-NUS Graduate Medical School (Duke-GMS)
- Prof George Augustine
Neuroscience Research Programme (A*STAR, Biopolis)
- A/P Soong Tuck Wah,
Head, Department of Physiology, National University of Singapore Yong Loo Lin School of Medicine; NGS EXCO member and Senior Faculty NGS
- A/P Lim Kah Leong,
National Neuroscience Institute (NNI)

GOVERNANCE AND ADMINISTRATIVE STRUCTURE

To facilitate the oversight of the SGPN, the Steering Committee will oversee the Management Committee in the implementation of the curriculum and in the operations of the Programme. The Management Committee will comprise all the module coordinators.

PROGRAMME REQUIREMENTS

As preparation for research and to ensure strong academic background in neuroscience and allied selected areas, students will complete required NGS course goals. This should include course work in at least 3 neuroscience foundation areas as follows:

Core Fundamental neuroscience modules:

1. Neuronal Signalling
(Module Coordinator: Dr Alan Lee Yiu Wah, Physiology)
2. Behavioral & Cognitive Neuroscience
(Module Coordinator: A/P Sanjay Khanna, Physiology)
3. Developmental Neuroscience
(Module Coordinator: Dr Marc Fivaz, Duke-NUS GMS)

To allow the student to tailor his/her program toward his/her specific areas of interest, selection of elective modules that may be non-neuroscience will be encouraged.

For SGPN and other graduate students at NUS, the Programme will offer elective neuroscience modules that include:

Elective Fundamental neuroscience modules:

4. Techniques in Neuroscience
(Module Coordinator: Dr Low Chian Ming, Pharmacology and Anaesthesia)
5. Brain Disorders and Repair*
(Module Coordinator: A/P Lim Kah Leong, National Neuroscience Institute)
6. Computational Neuroscience and Neuroengineering*
(Module Coordinator: Dr Yen Shih Cheng, Electrical and Computer Engineering)

**These will be offered as capsular modules*

It is important that graduate students, not only in neuroscience, take the required courses in ethics. NGS has two such courses in place.

Targeted number of students

The SGPN modules will be open to non-SGPN graduate students and the total number of students enrolled per module will be capped at 30.

Targeted start-date of program

August 2010

Length of scholarship: 4 years

Permitted candidacy: 5 years

CONTINUATION AND GRADUATION REQUIREMENTS

Thesis Advisory Committee (TAC)

A TAC will be formed immediately upon acceptance of the student into SGPN. The TAC should meet once every 6 months and report on the progress of the student with regards to his/her progress in research and coursework. The TAC will advise and recommend the continuation of the candidature, examine the student during the PhD Qualifying Examination (PQE) and finally recommend the write-up of the thesis. The Thesis Research Advisor will attend the TAC meeting but not as a member of the TAC.

Students will be required to achieve a CAP score of 3.8 for coursework and successfully defend the written thesis of their research work before he/she satisfies the criteria for the award of the PhD degree.

EXAMINATION AND ASSESSMENT PROCEDURES

Coursework and Thesis

Coursework: All modules will have multiple modes of assessment that will include continual assessments and a final examination. Continual assessments may take different forms such mid-terms tests, self-directed learning, journal presentations or written reports and the likes. The components of assessment will be different for each module as two proposed modules are capsular in nature.

Laboratory Rotation: SGPN students are encouraged to undergo 2 laboratory rotations of 2 months each before deciding on a supervisor by the end of the first semester in the first year of enrolment.

Thesis Qualifying Examination (TQE): Students are required to apply and pass the TQE by 18-24 months into his/her PhD programme. To qualify, the student will have to satisfy the TAC by submitting a written report of their research work, give a presentation and pass the oral examination.

Thesis: The thesis will be examined by one SGPN faculty, one local and one foreign examiner. The student will defend the thesis in an open seminar and in a closed door oral examination by the thesis examination committee.

S/N	Module	Coordinators	Proposed Lecturers
1	Neuronal Signalling	Alan Lee Yiu Wah	Alan Lee, George Augustine, Soong Tuck Wah, Shirish Shenolikar, Antonius van Dongen
2	Behavioral & Cognitive Neuroscience	Sanjay Khanna	Sanjay Khanna, Dale Purves, Gavin Dawe, Trevor Penney, Annette Schirmer, Michael Chee, Joshua Gooley
3	Developmental Neurobiology	Marc Fivaz	Eyleen Goh, Marc Fivaz, Suresh Jesthasan, Wang Hong Yan Yu Fengwei
4	Techniques in Neuroscience	Low Chian Ming	Low Chian Ming George Augustine, Sashi Kesavapany, Nicholas Hon, Chuang Kai Hsiang Gavin Dawe Sanjay Khanna Ng Yee Kong Lim Kah Leong
5	Brain Disorders and Repair (4Xcapsule modules)	Lim Kah Leong	Lim Kah Leong, Tang Bor Luen, Sashi Kesavapany, Chong Siow Ann, Ang Beng Ti, Einar Wilder-Smith, Low Chian Ming, Gavin Dawe, Zhang Xiaodong Shirish Shenolikar
6	Computational Neuroscience and Neuroengineering (4Xcapsule modules)	Yen Shih-Cheng	Antonius van Dongen, Yen Shih-Cheng, Li Xiaoping, Guan Cuntai