ISN-APSN Neuroscience School 2018 (Macau)

August 22-26, 2018 | Macau University of Science and Technology

The main objective of the ISN-APSN Neuroscience School 2018 (Macau) is to provide introduction for the new technologies in neuroscience research, such as live cell imaging, cell Isolation, metabolomics, gene sequencing, protein isolation and quantification, and computer-assisted drug design, as well as train the junior researchers (PhD. Students or postdoctoral fellows, hereby known as participants) in neuroscience to have better experiences/hands-on work and ideas for their projects.

Key Points

Theme:	New technologies in neuroscience research
Date:	August 22-26, 2018 (followed by APSN 2018)
Venue:	Macau University of Science and Technology, Taipa, Macau
Target Students:	Ph.D. students or postdoctoral fellows who are within 5 years of the award of their Ph.D. degree.
Quota:	25-30 people
Medium of instructions:	English

Program:

5-day program, including both comprehensive lectures and hands-on techniques associated with new technologies in neuroscience research, will be provided.

Day 1: Thursday, August 22, 2018	
Time	**Event**
9:00-9:40	Welcome ceremony and interactions between school faculties and participants
9:40-10:40	Hands-on grouping (6-8 participants/group, each group will experience hands-on workshops of 8 modules.)
10:40-11:00	Coffee break
11:00-11:40	30-minute lectures will be given by the module leaders and 10-minute discussion will follow. Module 1: Live cell imaging technology (by Assoc. Prof. Betty Law)
12:00-13:00	Lunch
13:30-14:10	Module 2: Isolation of neuronal cells (by Assoc. Prof. Betty Law)
14:10-15:10	Hands-on 1 (Group 1); Hands-on 2 (Group 4) During this period, the remaining two groups discuss and teach their experiences to each other. This plan will be applied to all the Hands-on slots.

15:10-16:10	Hands-on 1 (Group 2); Hands-on 2 (Group 3)
16:10-17:10	Hands-on 1 (Group 3); Hands-on 2 (Group 2)
17:10-18:10	Hands-on 1 (Group 4); Hands-on 2 (Group 1)
18:30-20:30	Welcome dinner at Season's Restaurant in campus
Day 2: Thursday, August 23, 2018	
Time	**Event**
9:00-9:40	Module 3: Stroke and molecular mechanisms of ischemia (by Chair Prof. Yi Zhun Zhu)
9:40-10:20	Module 4: Metabolomics technology (by Assoc. Prof. Ying Xie)
10:20-10:40	Coffee break
10:40-11:40	Discussion
12:00-13:00	Lunch
13:30-14:30	Hands-on 3 (Group 1); Hands-on 4 (Group 4)
14:30-15:30	Hands-on 3 (Group 2); Hands-on 4 (Group 3)
15:30-16:30	Hands-on 3 (Group 3); Hands-on 4 (Group 2)
16:30-17:30	Hands-on 3 (Group 4); Hands-on 4 (Group 1)
17:30-18:10	Discussion
18:30-21:30	BBQ party and social activities at Terrace of the Season's Restaurant
Day 3: Friday, August 24, 2018	
Time	**Event**
9:00-9:40	Module 5: Inflammation and neurodisorders (by Chair Prof. Richard DQ Ye)
9:40-10:20	Module 6: Gene sequencing and Protein isolation and quantification (by Assoc. Prof. Vincent Wong, Assoc. Prof. Elaine Leung)
10:20-10:40	Coffee break
10:40-11:20	Module 7: Molecular structure of possible targets for drug discovery (by Prof. Xiaojun Yao)
11:20-12:00	Discussion
12:00-13:00	Lunch
13:30-14:10	Module 8: Animal models and drug discovery (by Chair Prof. Yi Zhun Zhu)
14:20-17:40	Macau city tour
18:00-21:00	Dinner and skyview at Macau Tower
Day 4: Saturday, August 25, 2018	
Time	**Event**
9:00-10:00	Hands-on 5 (Group 1); Hands-on 6 (Group 4)
10:00-11:00	Hands-on 5 (Group 2); Hands-on 6 (Group 3)
11:00-12:00	Hands-on 7 (Group 3); Hands-on 8 (Group 2)
12:00-13:00	Hands-on 7 (Group 4); Hands-on 8 (Group 1)
13:00-14:00	Lunch

15:00-16:00	Special lecture 1: Invitation to Glyco-neurobiology (by Prof. Alessandro Prinetti)
16:00-17:00	Special lecture 2: Central myelin: biology and disease (by Prof. Hiroko Baba)
17:00-18:00	Discussion with Lecturers
18:00-20:30	Dinner
Day 5: Sunday, August 26, 2018	
Time	**Event**
9:00-10:00	Hands-on 5 (Group 3); Hands-on 6 (Group 2)
10:00-11:00	Hands-on 5 (Group 4); Hands-on 6 (Group 1)
11:00-12:00	Hands-on 7 (Group 1); Hands-on 8 (Group 4)
12:00-13:00	Hands-on 7 (Group 2); Hands-on 8 (Group 3)
13:00-14:00	Lunch
14:30-16:30	Participants' Presentations
16:30-16:50	Coffee break
16:50-17:40	Discussion and Awards
18:00-21:00	Farewell dinner at Season's Restaurant

Hands-on

First, the lecturers will introduce the principles, the corresponding techniques and instruments to the participants. Then, the participants will operate the instruments themselves to accomplish one part of an experiment under the supervision of the lecturers. Finally, the lecturers and participants will discuss about techniques, instruments, problems encountered and anything else related to the hands-on.

- Hands-on 1:

Participants will learn the principles and the experimental procedures of live cell imaging. Preparation of cells, use of confocal microscopy and image processing will be demonstrated, and then participants will do the experiment and get some images of living cells themselves. Fluorescence labeling, cellular morphology and the application of live cell imaging technology will be discussed.

- Hands-on 2:

Participants will learn the history, basic theory and principles of cell Isolation. Isolation of neuronal cells using flow cytometry will be demonstrated. After accomplishing the cell isolation, participants will know how to prepare a sample, use the instrument and isolate cells through the software. Data analysis and processing will be discussed extensively.

- Hands-on 3:

Participants will learn the formation of stroke, molecular mechanisms of ischemia, and the relative drug discovery. As a candidate, the anti-stroke effects and molecular mechanisms of leonurine will be illustrated. Then how to establish cell and animal models of stroke (ischemia/reperfusion) will be explained and demonstrated (only part of the experiment). Participants will observe rat blood vessels of the experimental group and control group and learn how to identify the state of stroke.

- Hands-on 4:

Participants will learn the history, basic theory, principles and instruments about metabolomics technology. The use of LC-MS in metabonomics analysis will be introduced. Sample preparation, the establishment of analytical methods and data analysis, as well as the discovery of new potential targets will be demonstrated and discussed. Participants will use the instrument to analyze data themselves.

- Hands-on 5:

The concepts of Inflammation and neurodisorders, the therapeutic drugs and the molecular mechanisms will be introduced. Participants will observe the animal models of rheumatoid arthritis and Alzheimer's disease, and learn how to establish the models. The analytical procedures will be discussed.

- Hands-on 6:

Participants will learn the history, basic theory, principles and hand on experimental procedures (demonstrated by tutor) of next generation sequencing, and protein isolation and quantification. The extraction and isolation of DNA and protein, QC, quantitation and library preparation procedure will be demonstrated. The applications of gene sequencing and protein isolation and quantification on biomedical research will be discussed.

- Hands-on 7:

Participants will learn the history, basic theory and principles of computer-assisted drug design. Molecular docking of drugs and proteins will be demonstrated. Participants will learn how to use the Autodock software to find the possible targets for a drug or to make the drug screening for a target protein. The applications of computer-assisted drug design in drug discovery will be discussed.

- Hands-on 8:

Animal models for different diseases and their applications in drug discovery will be introduced. The establishment of animal models for hypertension and diabetes will be demonstrated. How to choose an appropriate animal model for a disease will be discussed.

During the time when the remaining two groups are not participating in Hands-On training, they will discuss the contents of the above Hands-On and teach their experiences to each other. Their questions will be collected and solved during the Discussion session.

School participants' oral presentations (TBC by LOC)

Participants present their posters by oral and discuss with one another and faculties. Each presentation will take 10 minutes follow by a 5-minute discussion.

Participants' accommodation (To Be Confirm!!!)

About Macau

As a former colony of Portugal and a Special Administrative Region (SAR) of China, Macao is a city of duality. Its fortresses, churches and the culinary traditions of its former Portuguese colonial masters speak to a uniquely Mediterranean style on the China coast. These are intermixed with the customs, alleys, temples and shrines of its Chinese heritage. Because of its unique history, a number of properties were designated as UNESCO World Heritage Sites in 2005. Macao is also known as the 'Vegas of the East', the only place in China where gambling is legal, and it makes about 7 times more gaming revenues than the whole Las Vegas strip on its gaming.

Information for Application:

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