Alex T. L. LEONG, Ph.D.

ACADEMIC TRAINING

2018 The University of Hong Kong, *Hong Kong SAR* Postdoc. (Electrical & Electronic Engineering)
2017 The University of Hong Kong, Hong Kong SAR Ph.D. (Electrical & Electronic Engineering)
2013 The University of Hong Kong, Hong Kong SAR BEng. (Medical Engineering)

ACADEMIC APPOINTMENTS

2018-Present Research Assistant Professor, Dept. of Electrical & Electronic Engineering, HKU

AWARDS & HONORS

2019 Junior Fellow, International Society for Magnetic Resonance in Medicine
2018 Summa Cum Laude Merit Award, International Society for Magnetic Resonance in Medicine
2017 Young Investigator Award, Overseas Chinese Society for Magnetic Resonance in Medicine
2017 Magna Cum Laude Merit Award, International Society for Magnetic Resonance in Medicine
2015 Summa Cum Laude Merit Award, International Society for Magnetic Resonance in Medicine

RESEARCH INTERESTS

My long-term research goal is to apply integrated state-of-the-art in-vivo neuroimaging techniques to provide insights into the dynamic interactions of large-scale brain circuits.

- Neuromodulation techniques to interrogate large-scale complex brain circuits and networks.
- Neuroimaging methodologies specifically MRI and electrophysiology to examine temporal patterns of neural activity and their propagation characteristics.
- fMRI method development.

JOURNAL PUBLICATIONS

1. **Leong ATL**, Gu Y, Chan YS, Dong CM, Chan RW, Wang X, Liu Y, Lyu M & Wu EX: Optogenetic fMRI interrogation of brain-wide central vestibular pathways. ***Proceedings of the National Academy of Sciences USA,*** 116:20 2019; E10122-E10129 (research highlighted in HKU VP(R)'s Research Picks Column)
2. Wang X*, **Leong ATL***, Chan RW, Liu Y & Wu EX: Thalamic low frequency activity facilitates resting-state cortical interhemispheric MRI functional connectivity. ***Neuroimage***, 2019; 201:115985. (*equal contribution)
3. Liu Y, Lyu M, Barth M, Yi Z, **Leong ATL**, Chen F, Feng Y, Wu, EX: PEC-GRAPPA reconstruction of simultaneous multislice EPI with slice-dependent 2D Nyquist ghost correction. ***Magn Reson Med***, 2019; 81:1924-1934
4. **Leong ATL**, Dong CM, Gao PP, Chan RW, Sanes DH, Wu EX: Optogenetic auditory fMRI reveals the effects of visual cortical inputs on auditory midbrain response. ***Scientific Reports***, 8 2018; 8736
5. **Leong ATL**, Wu EX: fMRI: Making Connections in the Brain. ***eLife,*** 2017;6:e32064 (invited insight article)
6. Chan RW*, **Leong ATL***, Ho LC, Gao PP, Wong EC, Dong CM, Lim LW, Wu EX: Low Frequency Hippocampal-Cortical Activity Drives Brain-wide Resting-state Functional MRI Connectivity. ***Proceedings of the National Academy of Sciences USA***, 114.33 2017; E6972-E6981 (*equal contribution)
7. **Leong ATL**, Chan RW, Gao PP, Chan YS, Tsia KK, Yung WH, Wu EX: Long-range Projections Coordinate Distributed Brain-wide Neural Activity with a Specific Spatiotemporal Profile. ***Proceedings of the National Academy of Sciences USA***, 113.51 2016; E8306-E8315
8. Gao PP, Zhang JW, Chan RW, **Leong ATL**, Wu EX: BOLD fMRI Study of Ultrahigh Frequency Encoding in The Inferior Colliculus. ***Neuroimage***, 2015; 114:427-437

RECENT CONFERENCE PRESENTATIONS

Leong ATL, Wang X, Dong CM, Chan RW, Wu EX: Neural activity temporal pattern dictates the long-range brain-wide propagation pathways: An optogenetic fMRI study. *Proceedings of International Society of Magnetic Resonance in Medicine*, Montreal, Canada, p0202, 2019; (Summa Cum Laude Merit Award; Oral Presentation).

Leong ATL, Yong G, Wang X, Chan RW, Chan YS, Wu EX: Optogenetic fMRI of large-scale vestibular system and their cross-modal functions. *Proceedings of International Society of Magnetic Resonance in Medicine*, Montreal, Canada, p3751, 2019; (Summa Cum Laude Merit Award).

Wang X, **Leong ATL**, Chan RW, Wu EX: Thalamic low frequency activity contributes to resting-state cortical interhemispheric MRI functional connectivity. *Proceedings of International Society of Magnetic Resonance in Medicine*, Montreal, Canada, p1052, 2019.

Wang X, **Leong ATL**, Shuai G, Dong CM, Wu EX: Optogenetically-evoked spindle-like activity from thalamus propagates brain-wide and enhances rsfMRI connectivity. *Proceedings of International Society of Magnetic Resonance in Medicine*, Montreal, Canada, p3752, 2019.

Shuai G, **Leong ATL**, Wang X, Dong CM, Wong EC, Chan KWY, Bian L, Wu EX: Non-invasive Deep-brain Optogenetic fMRI Mediated by 808 nm Infrared-sensitized Upconversion Nanoparticles. *Proceedings of International Society of Magnetic Resonance in Medicine*, Montreal, Canada, p2990, 2019.

Dong CM, To A, Shuai G, Chan KWY, **Leong ATL**, Wu EX: In vivo MRI detection of ß-amyloid pathologies at early and late stages of Alzheimer's disease. *Proceedings of International Society of Magnetic Resonance in Medicine*, Montreal, Canada, p0618, 2019.

Wong EC**, Leong ATL**, Dong CM, To A, Wu EX: Optogenetic fMRI reveals ventral hippocampal modulatory effects on large-scale visual processing. *Proceedings of International Society of Magnetic Resonance in Medicine*, Montreal, Canada, p1009, 2019.

Wong EC, **Leong ATL**, Wang X, Dong CM, Wu EX: fMRI investigation of the role of interhemispheric interactions in cortical sensory processing. *Proceedings of International Society of Magnetic Resonance in Medicine*, Montreal, Canada, p3717, 2019.

Leong ATL, Wang X, Chan RW, Cao X, Wu EX: Optogenetic fMRI Dissection of Brain-wide Vestibular Pathways. *Proceedings of International Society of Magnetic Resonance in Medicine*, Paris, France, p1211, 2018; (Summa Cum Laude Merit Award; Oral Presentation).

Leong ATL, Wang X, Chan RW, El Hallaoui K, Wu EX: Neural Activity Pattern(s) Underlying Brain Interhemispheric Propagation: An Optogenetic fMRI Study. *Proceedings of International Society of Magnetic Resonance in Medicine*, Paris, France, p1111, 2018; (Magna Cum Laude Merit Award; Power Pitch Presentation).

Wang X, **Leong ATL**, El Hallaoui K, Dong CM, Wu EX: fMRI Mapping of Brain-wide Networks to Optogenetically-evoked Spindle-like Activity from Somatosensory Thalamus. *Proceedings of International Society of Magnetic Resonance in Medicine*, Paris, France, p4550, 2018.

Wong EC**,** Chan RW, **Leong ATL**, Dong CM, El Hallaoui K, To A, Wu EX: Does Ventral Hippocampus Influence Auditory Processing? An Optogenetic fMRI Study. *Proceedings of International Society of Magnetic Resonance in Medicine*, Paris, France, p1009, 2018; (Oral Presentation).

Chan RW, Wong EC**, Leong ATL**, Wang X, Dong CM, El Hallaoui K, Wu EX: Brain-wide Functional Organization of the Hippocampus along the Dorsoventral Axis: An Optogenetic fMRI Study. *Proceedings of International Society of Magnetic Resonance in Medicine*, Paris, France, p1109, 2018; (Power Pitch Presentation).

Dong CM**,** Chan RW, **Leong ATL**, Wong EC, Wu EX: Enhancement of Midbrain Auditory Responses to Behaviorally Relevant Vocalization by Optogenetically-initiated Dorsal Hippocampal Inputs. *Proceedings of International Society of Magnetic Resonance in Medicine*, Paris, France, p4542, 2018.

Chan RW Wong EC**, Leong ATL**, Wang X, Dong CM, El Hallaoui K, Lim LW, Wu EX: Optogenetically-initiated Low Frequency Dorsal Hippocampal Activity Enhances Resting-state fMRI Connectivity and Visual Memory Retrieval Performance. *Proceedings of International Society of Magnetic Resonance in Medicine*, Paris, France, p4652, 2018.

El Hallaoui K, Wong EC**,** Wang X, **Leong ATL**, Chan RW, Dong CM, Wu EX: Layer-specific Neural Interactions in the Thalamo-cortical and Cortico-cortical Networks: An Optogenetic Manganese-enhanced MRI Study. *Proceedings of International Society of Magnetic Resonance in Medicine*, Paris, France, p0400, 2018 (Oral Presentation).

Leong ATL, Wang X, Chan RW, Ho LC, Qiu Y, Dong CM, Wu EX: Optogenetic Resting-state fMRI Reveals Thalamic Modulation of Long-range Sensory Networks. *Proceedings of International Society of Magnetic Resonance in Medicine*, Honolulu, HI, p0239, 2017; (Magna Cum Laude Merit Award; Power Pitch Presentation).

Leong ATL, Chan RW, Wang X, Dong CM, Ho LC, Wu EX: Low Frequency Activity from Somatosensory Thalamus Propagates Brain-wide and Modulates Top-down Visual Processing. *Proceedings of International Society of Magnetic Resonance in Medicine*, Honolulu, HI, p5401, 2017.

Leong AT, Wang X, Chan RW, Dong CM, Yung WH, Chan YS, Tsia KK, Wu EX: Optogenetic and Pharmacological Resting-state Functional MRI Reveals Thalamic Modulation of Brain-wide Functional Connectivity. *Neuroscience 2017*, Washington, DC, 717.16, 2017.

CM Dong, **Leong ATL**, Chan RW, Wang X, Wu EX: Optogenetically-evoked Somatosensory Inputs Enhance Sound Processing in The Auditory System. *Proceedings of International Society of Magnetic Resonance in Medicine*, Honolulu, HI, p0110, 2017; (Oral Presentation).

Chan RW, **Leong ATL**, Ho LC, Wang X, To A, Wu EX: Low Frequency Hippocampal-cortical Activity Contributes to Brain-wide Connectivity as Measured by Resting-state fMRI. *Proceedings of International Society of Magnetic Resonance in Medicine*, Honolulu, HI, p1156, 2017; (Oral Presentation).

CM Dong, Chan RW, Ho LC **Leong AT**, Wong EC, Wang L, Chen FF, Lau C, Wu EX: Pharmacological Inactivation of Dorsal Hippocampus Enhances Responses and Induces Adaptation to Sound in Midbrain. *Proceedings of International Society of Magnetic Resonance in Medicine*, Honolulu, HI, p5310, 2017.

Leong AT, Chan RW, Gao PP, Liu Y, Wang X, Tsia KK, Wu EX: Optogenetic fMRI Reveals Differences Between Paralemniscal and Lemniscal Somatosensory Thalamocortical Circuit. *Proceedings of International Society of Magnetic Resonance in Medicine*, Singapore, p0482, 2016; (Oral Presentation).

Leong AT, Chan RW, Gao PP, Cheng JS, Zhang JW, Fan SJ, Tsia KK, Wong KKY, Wu EX: Frequency Specific Optogenetic Recruitment of Evoked Responses in The Somatosensory Thalamocortical Circuit. *Proceedings of International Society of Magnetic Resonance in Medicine*, Toronto, Canada, p0135, 2015; (Summa Cum Laude Merit Award; Oral Presentation).