

The 57th Frontier Brain Science Seminar

Sponsored by Research Center for Idling Brain Science (RCIBS)

ADAR2-mediated RNA editing of Cav1.3 channels: Implications in learning and memory

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Date: 14th April, 2023 (FRI.) 17:00~18:30

Venue: Clinical Lecture Room1 (附属病院2階 臨床講義室1)

Our lab has a long-standing interest in understanding the diversification of structure and function of voltage-gated calcium channels via post-transcriptional modifications. Here, I will present our discovery of Cav1.3 RNA editing and how editing of the IQ-domain affects Ca²⁺-dependent inactivation of the Cav1.3 channels. Unexpectedly, we uncovered that RNA editing of the Cav1.3 is neuron-selective and that restricted editing of Cav1.3 channel is due to the alternative splicing of an editing repressor which is a ubiquitously expressed splicing factor, SRSF9. To address the physiological significance of Cav1.3 RNA editing, we generated editing complementary sequence null (Cav1.3^{□ECS}) mice that were genetically targeted to produce unedited Cav1.3 channels. Electrophysiological hippocampal slice recordings showed enhanced late-LTP and the Cav1.3^{□ECS} mice have better spatial learning and memory as demonstrated by behavioural tests using the Morris Water-maze. The next question we will address is whether there are trade-offs to the loss of Cav1.3 RNA editing.

References

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Organizer: Javan Lee (RCIBS/Dept. of Biochemistry) (Ext.7228)