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Statut universitaire / University status
Professeur sous octroi adjoint, Département de neurosciences, Faculté de médecine, Université de Montréal

Appartenance à d'autres groupes / Affiliation with other groups
Membre régulier, Groupe de recherche sur le système nerveux central (GRSNC) du FRQS

Formation / Training
Stage postdoctoral, Neuroscience, Howard Hugues Medical Institute, Chevy Chase, MD, États-Unis, 2010
Resarch specialist, Neuroscience, Howard Hughes Medical Institute, Chevy Chase, MD, États-Unis, 2011
Stage postdoctoral, Neuroscience, Columbia University, Montréal, QC, Canada, 2011

Orientations de la recherche
- Input/output properties of pyramidal neurons of the neocortex
- Dendritic function and the role of dendritic spines in synaptic processing, plasticity, and integration in pyramidal neurons in heath and disease with the use of state of-the-art imaging and electrophysiological techniques
- Development of novel optical tools to probe spine function

Principaux projets en cours
- Role of dendritic spines in the processing, storage and integration of excitatory inputs in healthy animals and on a murine model of Fragile-X mental retardation syndrome
- Molecular identity and functional role of voltage-gated channels in dendritic spines of neocortical pyramidal neurons
- Study the role of spine-channel splicing in excitatory synaptic transmission: Role of the splicing factor Nova2

Research orientations
- Input/output properties of pyramidal neurons of the neocortex
- Dendritic function and the role of dendritic spines in synaptic processing, plasticity, and integration in pyramidal neurons in heath and disease with the use of state of-the-art imaging and electrophysiological techniques
- Development of novel optical tools to probe spine function

Current research projects
- Role of dendritic spines in the processing, storage and integration of excitatory inputs in healthy animals and on a murine model of Fragile-X mental retardation syndrome
- Molecular identity and functional role of voltage-gated channels in dendritic spines of neocortical pyramidal neurons
- Study the role of spine-channel splicing in excitatory synaptic transmission: Role of the splicing factor Nova2

Publications choisies / Selected publications

Saito, Y., Miranda-Rottmann, S., Ruggiu, M., Park, C. Y., Fak, J. J., Zhong, R., Duncan, J. S., Fabella, B. A., Junge, H. J., Chen, Z., Araya, R., Fritzsch, B., Hudspeth, A. J. and Darnell, R. B. (2016). NOVA2-mediated RNA regulation is required for axonal pathfinding during development. *Elife*, 5.

Araya, R. (2014). Input transformation by dendritic spines of pyramidal neurons. *Front Neuroanat*, 8: 141.

Araya, R., Vogels, T. P. and Yuste, R. (2014). Activity-dependent dendritic spine neck changes are correlated with synaptic strength. *Proc Natl Acad Sci U S A*, 111 (28): E2895-904.

Araya, R., Andino-Pavlovsky, V., Yuste, R. and Etchenique, R. (2013). Two-photon optical interrogation of individual dendritic spines with caged dopamine. *ACS Chem Neurosci*, 4: 1163-7.

Nikolenko, V., Peterka, D. S., Araya, R., Woodruff, A. and Yuste, R. (2013). Spatial light modulator microscopy. *Cold Spring Harb Protoc*, 2013 (12): 1132-41.

Fino, E., Araya, R., Peterka, D. S., Salierno, M., Etchenique, R. and Yuste, R. (2009). RuBi-Glutamate: Two-Photon and Visible-Light Photoactivation of Neurons and Dendritic spines. *Front Neural Circuits*, 3: 2.

Nikolenko, V., Watson, B. O., Araya, R., Woodruff, A., Peterka, D. S. and Yuste, R. (2008). SLM Microscopy: Scanless Two-Photon Imaging and Photostimulation with Spatial Light Modulators. *Front Neural Circuits*, 2: 5.

Araya, R., Nikolenko, V., Eisenthal, K. B. and Yuste, R. (2007). Sodium channels amplify spine potentials. *Proc Natl Acad Sci U S A*, 104: 12347-52.

Araya, R., Eisenthal, K. B. and Yuste, R. (2006). Dendritic spines linearize the summation of excitatory potentials. *Proc Natl Acad Sci U S A*, 103: 18799-804.

Araya, R., Jiang, J., Eisenthal, K. B. and Yuste, R. (2006). The spine neck filters membrane potentials. *Proc Natl Acad Sci U S A*, 103: 17961-6.