François Windels

Ph.D.

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Education

2001	Neuroscience, Université Joseph Fourier, Grenoble, France.	Ph.D.
1996	Neuroscience, Université Joseph Fourier, Grenoble, France	M.D Bachelor
1994	Science, Université de Caen, Caen, France.	

Current Positions

2016.01-	Queensland Brain Institute Asia Pacific Centre for Neuromodulation	Senior Research Fellow

Brief Introduction

Dr François Windels is a neurophysiologist working at the Queensland brain institute and Asia Pacific Centre for Neuromodulation at the university of Queensland. He received his PhD from the university of Grenoble, France, in 2001, for research on the mechanism of deep brain stimulation used to improve Parkinson's disease symptoms. He then moved to the National institute on drug abuse where he worked on neurotransmission in the basal ganglia and was the first showing multi-neurotransmitters interaction in physiologically relevant conditions.
In 2006 he joined Pr. Pankaj Sah laboratory at the Queensland Brain Institute to work on synaptic plasticity. He is actively developing innovative approaches to study brain network dynamics and has successfully applied this new framework to experimental results from animal models and clinical data obtained from human deep brain recordings. With this approach he recently showed that coordinated activity from groups of neurons in the brainstem are involved in motor planning.

Publications

Giorni A, Windels F, Stratton PG, Cook R, Silberstein P, Coyne T, et al. Single-unit activity of the anterior globus pallidus internus in Tourette patients and posterior globus pallidus internus in Dystonic patients. Clinical Neurophysiology. 2017 Oct 14;1–26.

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Windels F, Thevathasan W, Silburn P, Sah P. Where and what is the PPN and what is its role in locomotion? *Brain*. Oxford University Press; 2015 May;138(Pt 5):1133–4.

Boskovic, Z., Alfonsi, F., Rumballe, B. A., Fonseka, S., **Windels, F**., & Coulson, E. J. (2014). The Role of p75NTR in Cholinergic Basal Forebrain Structure and Function. *The Journal of Neuroscience 34*(39), 13033–13038.

Tattersall, T. L., Stratton, P. G., Coyne, T. J., Cook, R., Silberstein, P., Silburn, P. A., **Windels, F**. and Sah, P. (2014). Imagined gait modulates neuronal network dynamics in the human pedunculopontine nucleus. *Nature Neuroscience*. This study is unique in describing temporary functional networks of neurons phase locked with alpha oscillation and their modulation during movements in human.

Ball, D., Kliese, R**., Windels, F**., Nolan, C., Stratton, P., Sah, P., & Wiles, J. (2014). Rodent scope: a user-configurable digital wireless telemetry system for freely behaving animals. *PLoS ONE*, *9*(2), e89949.

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Oluich, L.-J., Stratton, J. A. S., Lulu Xing, Y., Ng, S. W., Cate, H. S., Sah, P., **Windels, F**., et al. (2012). Targeted ablation of oligodendrocytes induces axonal pathology independent of overt demyelination. *The Journal of Neuroscience*, *32*(24), 8317–8330.

Stratton, P., Cheung, A., Wiles, J., Kiyatkin, E., Sah, P., & **Windels, F.** (2012). Action potential waveform variability limits multi-unit separation in freely behaving rats. *PLoS ONE*, *7*(6), e38482. We showed the limits of waveform based spike sorting and the potential extent of spike misclassification. This work challenges the possibility of obtaining single unit

resolution with a single recording channel.

Windels, F., Crane, J. W., & Sah, P. (2010). Inhibition dominates the early phase of up-states in the basolateral amygdala. *Journal of Neurophysiology*, *104*(6). (IF: 3.04; citation: 7)
This in vivo study demonstrates that in amygdala pyramidal neurons excitation and inhibition are not balanced during cortical inputs. Most previous studies were based on in vitro preparations and afferent stimulations.

Crane*, J. W., **Windels, F***., & Sah, P. (2009). Oscillations in the basolateral amygdala: aversive stimulation is state dependent and resets the oscillatory phase. *Journal of Neurophysiology*, *102*(3), 1379–1387.
* equal contribution. This is the first study showing that a single aversive stimulus is enough to reset an ongoing thalamo-cortical oscillation in vivo, thus showing how a brief stimulation can override spontaneous activity.

Windels, F. (2006). Neuronal activity: from in vitro preparation to behaving animals. *Molecular Neurobiology*, *34*(1), 1–26.

Windels, F., & Kiyatkin, E. A. (2006a). Dopamine action in the substantia nigra pars reticulata: iontophoretic studies in awake, unrestrained rats. *The European Journal of Neuroscience*, *24*(5), 1385–1394.

Windels, F., & Kiyatkin, E. A. (2006b). GABAergic mechanisms in regulating the activity state of substantia nigra pars reticulata neurons. *Neuroscience*, *140*(4), 1289–1299.

Windels, F., & Kiyatkin, E. A. (2006c). General anesthesia as a factor affecting impulse activity and neuronal responses to putative neurotransmitters. *Brain Research*, *1086*(1), 104–116.

Windels, F., & Kiyatkin, E. A. (2006d). Stability of substantia nigra pars reticulata neuronal discharge rates during dopamine receptor blockade and its possible mechanisms. *Neuroreport*, *17*(10), 1071–1075.

Windels, F., Carcenac, C., Poupard, A., & Savasta, M. (2005). Pallidal origin of GABA release within the substantia nigra pars reticulata during high-frequency stimulation of the subthalamic nucleus. *The Journal of Neuroscience : 25*(20), 5079–5086.

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nigra reticulata neurons in awake, unrestrained rats. *The Journal of Neuroscience 24*(30), 6751–6754. This is the first in vivo study demonstrating the impact of anesthesia on the modulation of neuronal activity by GABA and glutamate.

Windels, F., & Kiyatkin, E. A. (2003). Modulatory action of acetylcholine on striatal neurons: microiontophoretic study in awake, unrestrained rats. *The European Journal of Neuroscience*, *17*(3), 613–622.

Windels, F., Bruet, N., Poupard, A., Feuerstein, C., Bertrand, A., & Savasta, M. (2003). Influence of the frequency parameter on extracellular glutamate and gamma-aminobutyric acid in substantia nigra and globus pallidus during electrical stimulation of subthalamic nucleus in rats. *Journal of Neuroscience Research*, *72*(2), 259–267.

Bruet, N., **Windels, F**., Carcenac, C., Feuerstein, C., Bertrand, A., Poupard, A., & Savasta, M. (2003). Neurochemical mechanisms induced by high frequency stimulation of the subthalamic nucleus: increase of extracellular striatal glutamate and GABA in normal and hemiparkinsonian rats. *Journal of Neuropathology and Experimental Neurology*, *62*(12), 1228–1240.

Bruet, N., **Windels, F**., Bertrand, A., Feuerstein, C., Poupard, A., & Savasta, M. (2001). High frequency stimulation of the subthalamic nucleus increases the extracellular contents of striatal dopamine in normal and partially dopaminergic denervated rats. *Journal of Neuropathology and Experimental Neurology*, *60*(1), 15–24.

Windels, F., Bruet, N., Poupard, A., Urbain, N., Chouvet, G., Feuerstein, C., & Savasta, M. (2000). Effects of high frequency stimulation of subthalamic nucleus on extracellular glutamate and GABA in substantia nigra and globus pallidus in the normal rat. *The European Journal of Neuroscience*, *12*(11), 4141–4146. This is the first study proposing an experiment-based mechanism for the therapeutic effect of deep brain stimulation.

Urbain, N., Gervasoni, D., Soulière, F., Lobo, L., Rentéro, N., **Windels, F**., et al. (2000). Unrelated course of subthalamic nucleus and globus pallidus neuronal activities across vigilance states in the rat. *The European Journal of Neuroscience*, *12*(9), 3361–3374.