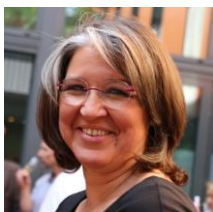




EEG Phenotyping

Reveal the translational potential of CNS preclinical models and identify/validate new Neurotherapeutics



Corinne ROUCARD, PhD
CEO SynapCell



SynapCell's PosterPresentation n°30
***EEG Phenotyping: turn your animal model
into a DD tool***
ASENT 2021

Why EEG Phenotyping?

1 

Find **the right EEG biomarker** for the **right model** of CNS disorders

...and access to a true proxy for brain dysfunction

2 

Upgrade any of your rodent models with a **translational EEG biomarker**

...even though no symptomatic/behavior phenotype evidence observed

3 

Identify/validate new promising **Neurotherapeutics**

...and secure your IND application

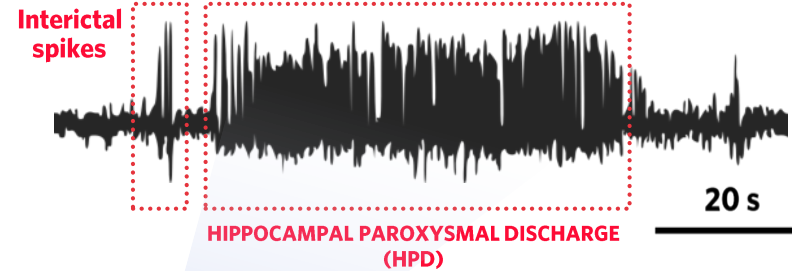
MesioTemporal Lobe Epilepsy

HPD - Translational EEG BM of focal epilepsy

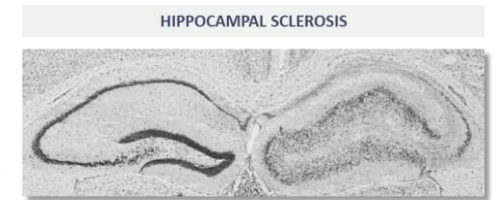
Human MTLE



MTLE Mouse model (intrahippocampal Kainate)



HPD in the MTLE mouse
Frequency 7-11 Hz | Duration 15-20 s
Occurrence 30-60 HPDs/h



Cell loss: CA1, CA3, hilus of DG | Dispersion of granular cells (DG)



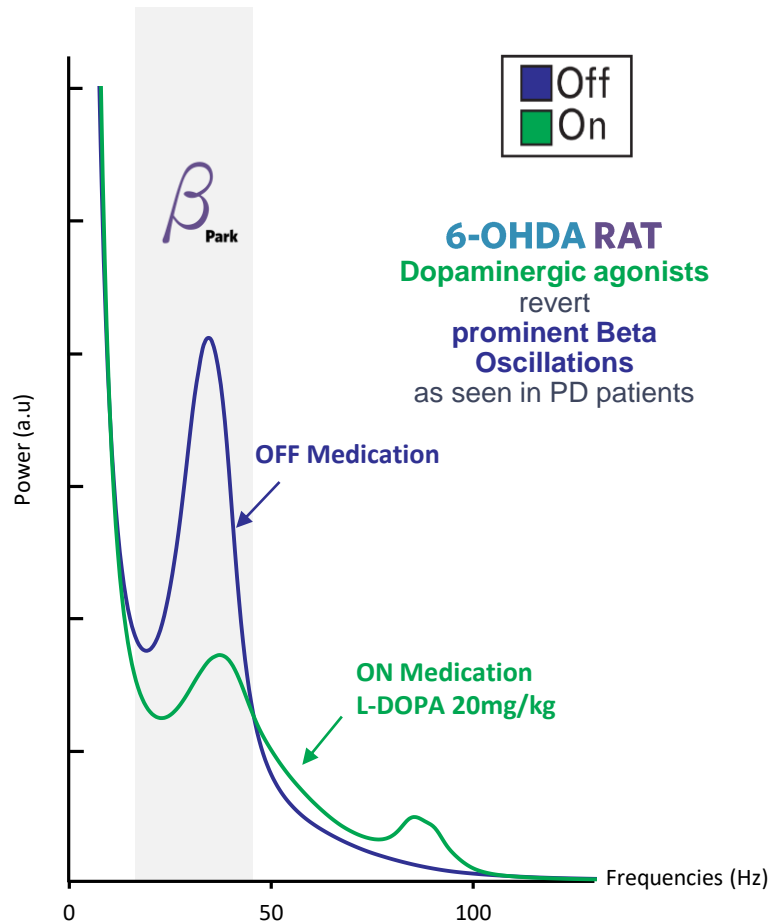
Duveau et al. 2016 CNS Neuroscience and Therapeutics

- **Applications:** Anti-epileptic drug efficacy evaluation, screening, Hit to Lead, Lead validation, neuroprotective/disease modifying effect

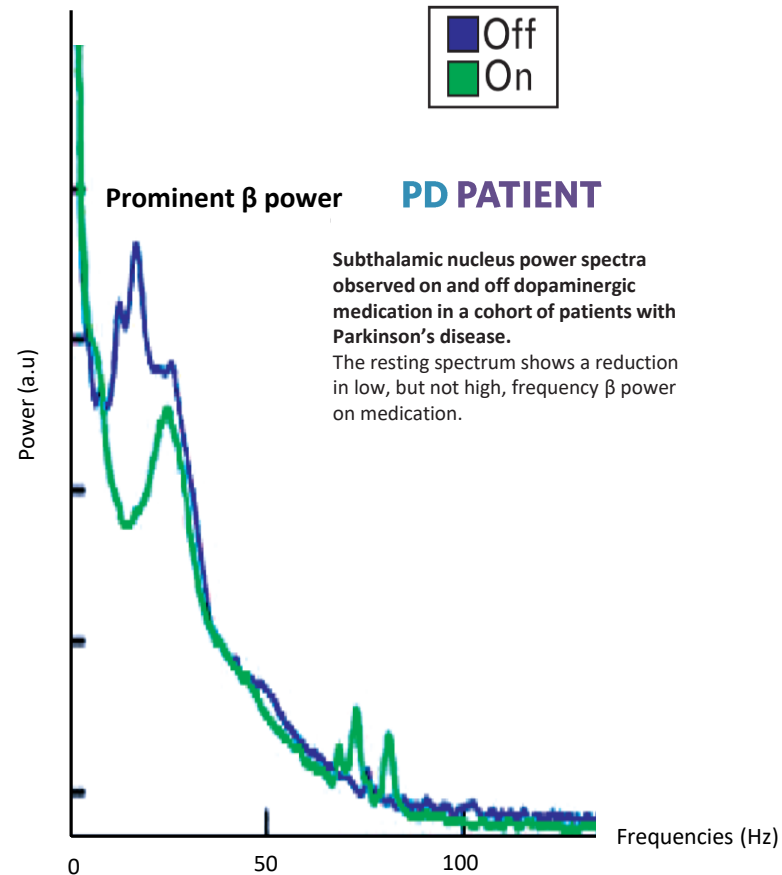
Parkinson's disease

BetaPark - Translational EEG BM of Parkinsonism

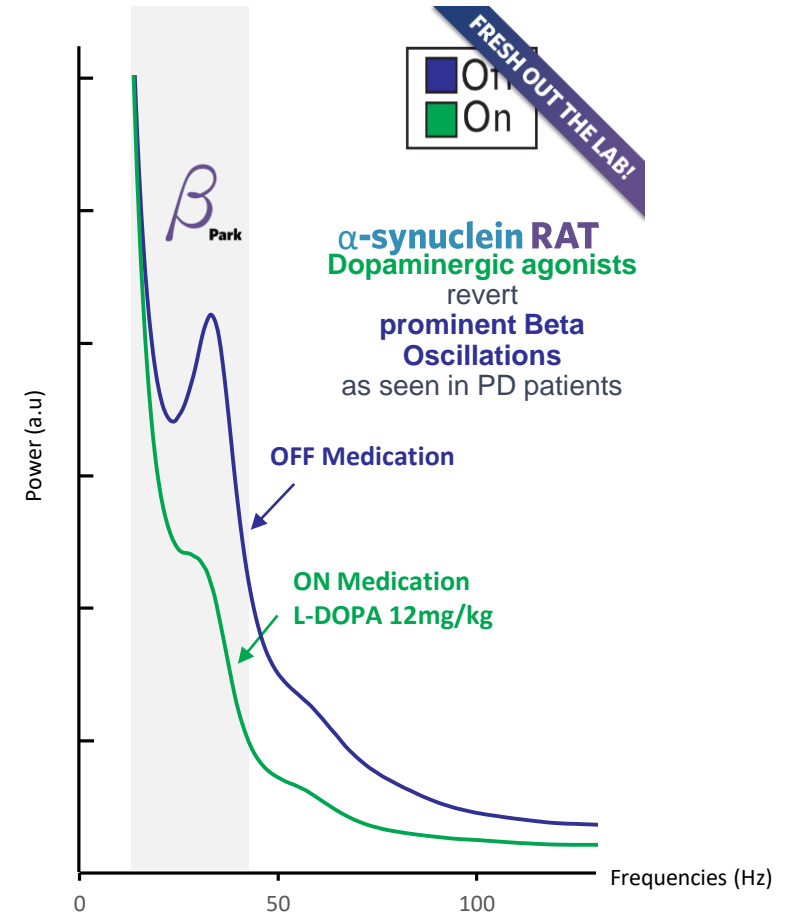
- **Applications:** Anti-PD drug efficacy evaluation, neuroprotective/disease modifying effect, alphasynuclein aggregate testing



SynapCell data, 2015



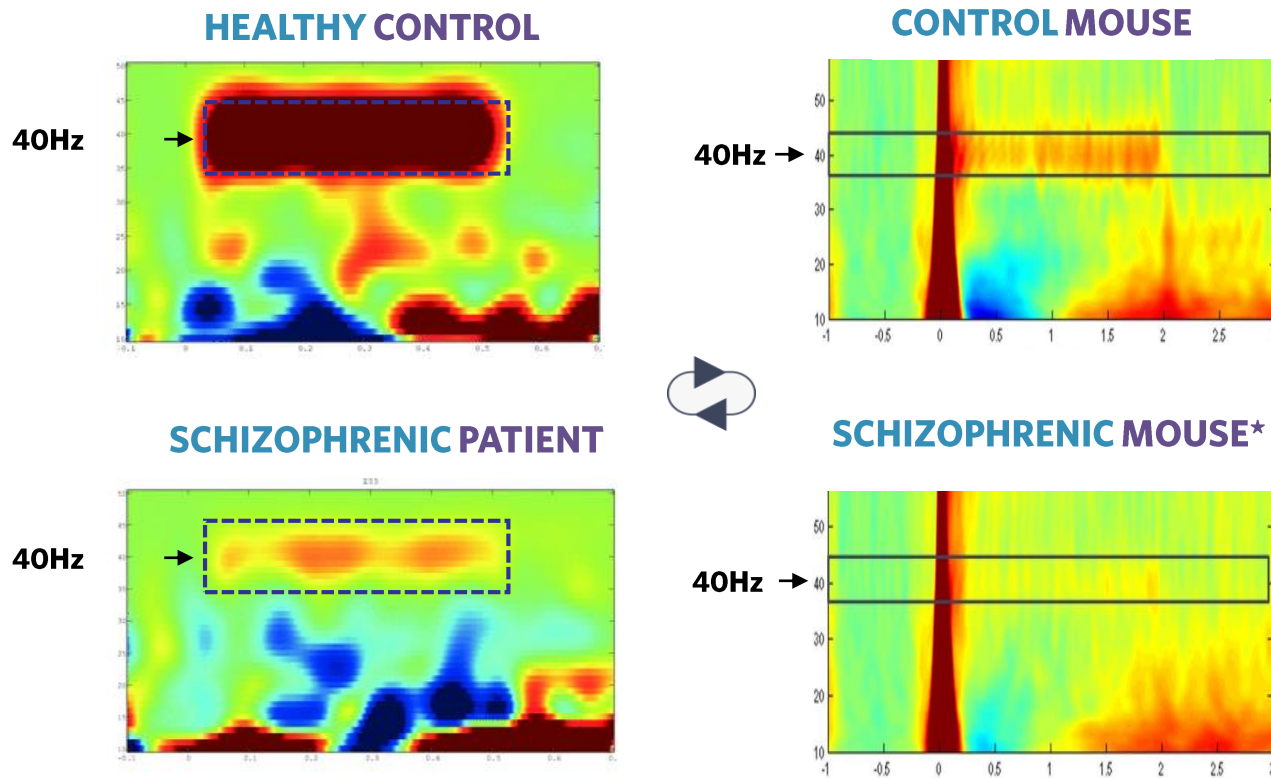
Adapted from Oswal, 2013



SynapCell data, 2020

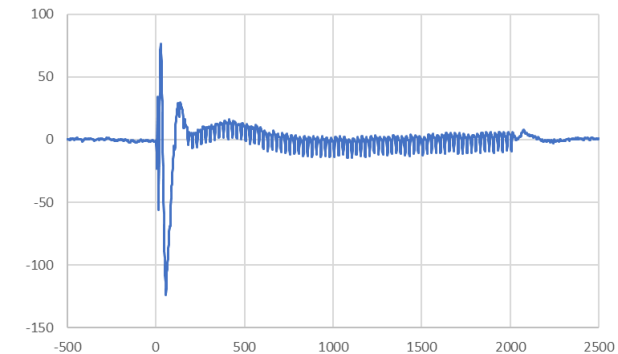
Psychiatric diseases – Cognitive processes

40Hz ASSR – a translational BM for processing of sensory information



1. AUDITIVE STIMULATION (40Hz) → 2. CORTICAL RESPONSE (40Hz)

360 trains of stimulation



- Time-frequency distribution characteristics of ASSRs under 40 Hz stimulation in case and control groups
- **Significant reduction of the 40Hz ASSR** is observed in Schizophrenic patients as well as in a mouse model of schizophrenia
- **Applications:** Cognitive function testing, cognitive enhancers efficacy evaluation in psychiatric or neurodegenerative disorders

Sun et al., 2018. Defects of Gamma Oscillations in Auditory Steady-State Evoked Potential of Schizophrenia. Shanghai archives of psychiatry.

*Genetic mouse model of schizophrenia (undisclosed)
SynapCell data, 2016

15+ years of successful EEG Phenotyping Projects



CNS DISORDER	CLINICAL EEG BIOMARKER	PRECLINICAL EEG BIOMARKER	PRECLINICAL MODEL
Focal Epilepsy	HPD	HPD	MTLE mouse
Absence Generalized Epilepsy	SWD	SWD	GAERS rat <i>SynapCell's World-exclusive licence</i>
Parkinson's disease Prodromal and Symptomatic	BETA OSCILLATIONS	BETA OSCILLATIONS <i>BetaPark</i>	6-OHDA rat AAV-alphasynuclein rat ¹
Parkinson's disease L-Dopa-induced Dyskinesia	GAMMA OSCILLATIONS	GAMMA OSCILLATIONS <i>GammaPark</i>	6-OHDA rat
Cognitive disorders Schizophrenia, Cognitive deficits, Autism Spectrum Disorders	40Hz ASSR	40Hz ASSR	NMDA deficit models ² (Ketamine, MK801 ³ , PCP ⁴)
Essential Tremor	ETB	ETB	Harmaline mouse Harmaline rat ⁵

BEDSIDETOBENCH
TRANSLATION

^{1,3,4,5} R&D stage – ongoing
² Available for rats and mice