



Revolutionary EEG Analysis for Clinical Trials

Drug development needs an improvement

Drug development is expensive and incurs a high risk of failure in clinical trials. Deeper insights into drug effects via secondary endpoints are needed, combined with better stratification of early-stage patient groups.

Better insights through state-of-art EEG analysis

NBT Analytics provides state-of-art EEG analysis. We are not a traditional EEG provider. By using machine learning algorithms, our method offers the most comprehensive insights into the effects of drugs or disorders on brain activity.

NBT Analytics adds value to your clinical trial by:

- Providing deeper insights into drug or disorder effects
- Reducing the size of experimental groups whilst keeping statistical power high
- Increasing the robustness of results
- Supporting patient stratification
- Allowing for retrospective analysis of trials

Do not miss out on the latest developments

NBT Analytics has developed an analysis pipeline that selects the most relevant biomarkers and integrates them to one data point. This novel method allows us to perform more extensive analyses than have been done before. **Contact us to find out more about analyses for your trial.**

EEG is the solution

EEG is an information rich, broadly available, and inexpensive measure of brain activity that can provide a deep understanding of drug effects on the brain.

Control-Alzheimer's

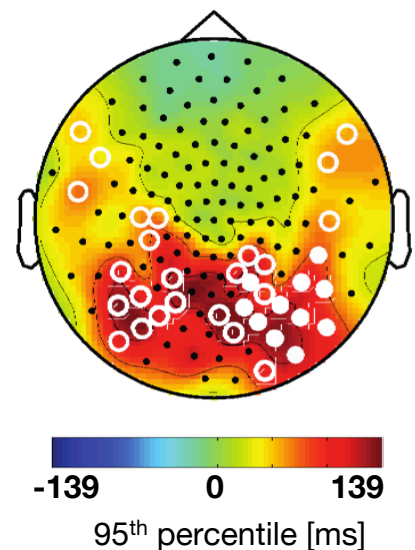


Figure 1: EEG is sensitive to excitatory and inhibitory balance in brain disorders^{2,3}. Here Alzheimer's Disease¹

TAILORED • TRANSPARENT • ACCURATE



Integrating Knowledge

Using machine learning algorithms to
revolutionize drug development

A comprehensive selection of biomarkers

NBT Analytics delivers comprehensive selection and mapping of detailed changes in brain activity using our broad selection of EEG biomarkers.

Our portfolio of EEG biomarkers covers;

- Spectral biomarkers: e.g. power, central frequency, cross frequency phase coupling.
- Spatial biomarkers: e.g. phase lag index and phase locking value.
- Temporal biomarkers: e.g. detrended fluctuation analysis and oscillation burst duration.

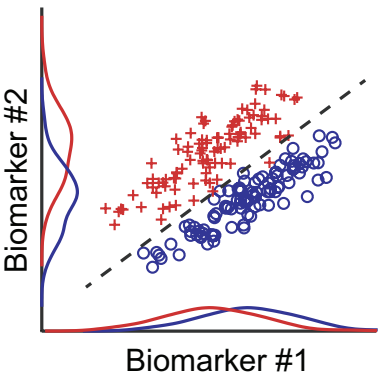


Figure 2: Integration of multiple biomarkers reveals hidden separation boundaries⁴.

Beyond single biomarkers

EEG can be parameterized in multiple biomarkers that often carry complementary sensitivity to drug- or disease-induced changes in brain activity. By integrating multiple biomarkers into a single index, we achieve a much higher accuracy of classifying the presence of such effects compared to a single-biomarker analysis.

Supporting patient stratification

Integrated indices have great potential for supporting patient stratification. We have showed preliminary results of stratification of early-stage Alzheimer’s disease. Figure 3 shows that using multiple biomarkers (*right*) results in a superior outcome in stratifying patients than single biomarkers (*left*).

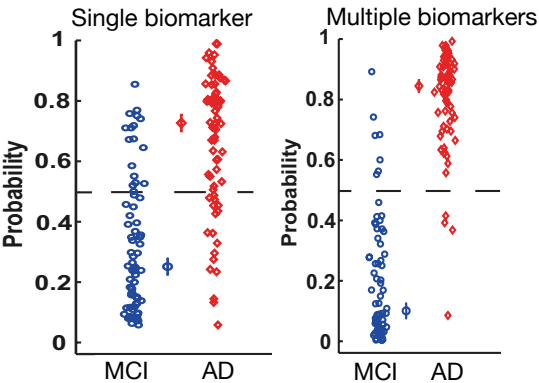


Figure 3: Probability that patients belong to mild cognitive impairment group (MCI) or Alzheimer’s Disease (AD). Using more biomarkers allows for patient stratification.

Example case Scopolamine

The integrated index was used in a clinical trial involving a Scopolamine challenge. This analysis can be used to better assess effects at different drug dosage levels. Figure 4 shows the difference in activity of the Scopolamine index (red) versus the placebo (blue) at different time points showing that drug indices can reveal detailed information.

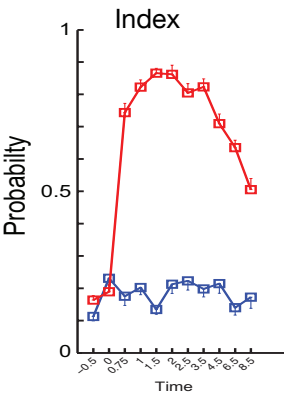


Figure 4: Scopolamine index shows effect of pharmacological intervention

Publications

- ¹Montez T., Poil S.S., et al. *PNAS* 106:1614-1619 (2009)
- ²Poil S.S., et al. *Eur J Neurosci.* 34(3):394-403 (2011)
- ³Poil S.S., et al. *J Neurosci.* 32(29):9817-9823 (2012)
- ⁴Poil S.S., et al. *Front. Aging Neurosci.* 5:58, (2013)

SELECTION • INTEGRATION • STRATIFICATION

NBT Analytics is the leading full service expert

NBT Analytics is the leading expert in big data EEG analysis for drug development. The founders of NBT Analytics developed the open-source Neurophysiological Biomarker Toolbox, on which NBT Analytics has based its technology. This toolbox has more than 1300 registered research users.

NBT Analytics is not just a data analytics company. We take a personal interest in our clients and work together to get the best results. We are always available for advice and involve our clients with our analysis process to ensure transparency and understanding.



About NBT Analytics

NBT Analytics is a spin-off from the Vrije Universiteit Amsterdam. It was founded in 2015 by Dr. Klaus Linkenkaer-Hansen and Dr. Simon-Shlomo Poil from the Neural Oscillations and Cognition group at the Center for Neurogenomics and Cognitive Research.

Are you using Scopolamine or Mecamylamine?

NBT Analytics has developed drug specific indices for Scopolamine and Mecamylamine. These indices can be directly applied to improve your clinical trial. We are currently developing many more indices together with our CRO and Pharmaceutical partners.

Are you investigating another drug or disorder?

NBT Analytics is currently looking for premium partners to co-develop new indices with. Do you have a data set that needs an analysis?

Contact us to find out how your trial can benefit from our expertise!



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