INTRODUCTION

Brain functional connectivity (FC), as measured with fMRI, is not stationary. Although it is well accepted that task engagement changes FC during rest, there is no consensus about the origin or cognition (Figure 1A). Some argue that FC reflects fluctuations in on-going cognition, or a manifestation of intrinsic brain maintenance mechanisms, which could have positive clinical value. Conversely, others have concluded that rest FC is mostly the result of sampling variability, head motion or fluctuating sleep states.

METHODS / EXPERIMENTAL DESIGN

RESULTS ON-MULTI-TASK DATA

RESULTS ON-REST-ONLY DATA

CONCLUSIONS

1) Dynamic functional connectivity during rest, to some extent, a manifestation of covert self-driven cognition.
2) Sparse Paradigm Free Mapping and Laplacian Embeddings can be used to probe dynamic FC during task and rest.
3) Several different behavioral relevant whole-brain FC configurations may occur during a single resting scan even in the absence of any task.”
4) The cognitive correlates of these FC configurations can be decoded using existing open-ended decoding engines.
5) Data-driven estimates of covert cognition agree with previous reports of most common “resting” mental processes.