

POSTER PRESENTATION

Open Access

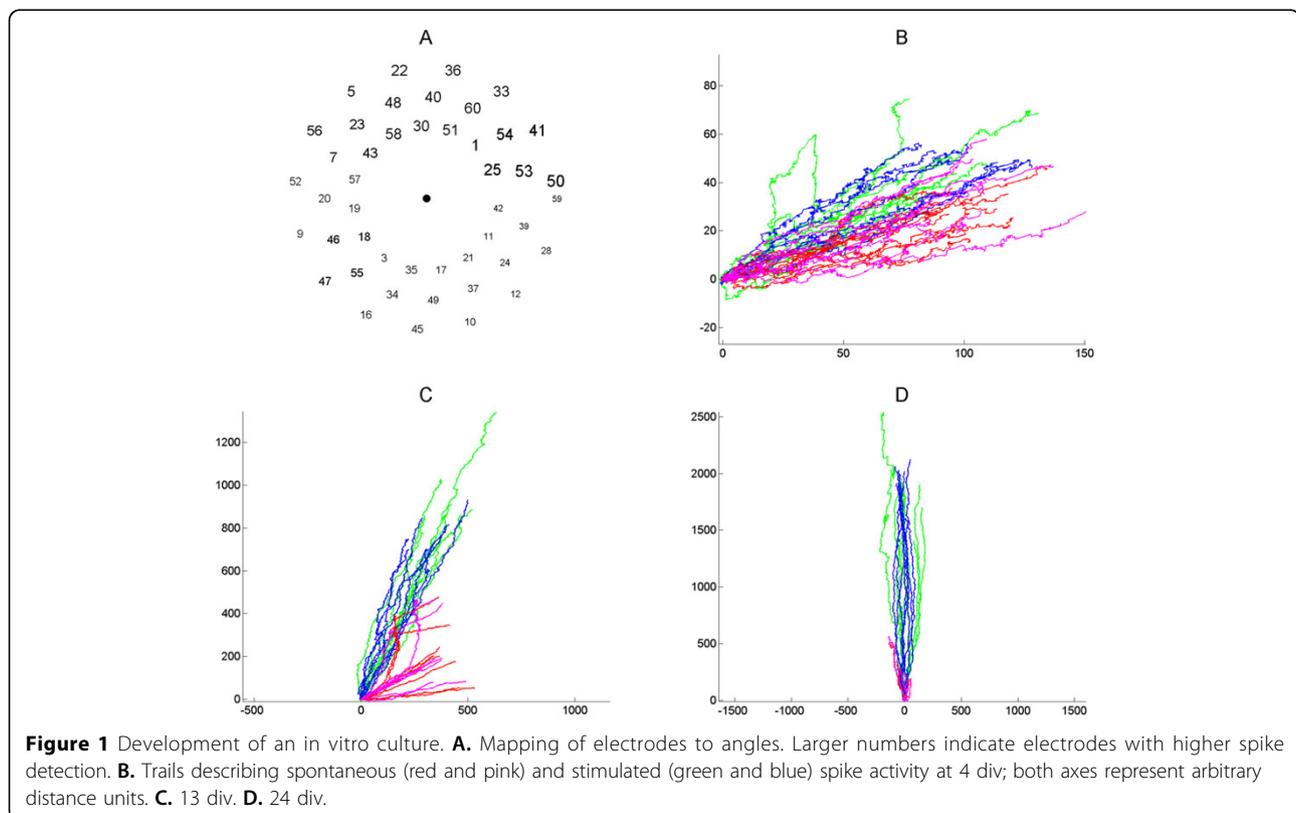
# Visualizing spike activity during neuronal network development

Nicholas Vachon<sup>1</sup>, Thomas R Kiehl<sup>2</sup>, Charles Bergeron<sup>1\*</sup>

From The Twenty Third Annual Computational Neuroscience Meeting: CNS\*2014  
Québec City, Canada. 26-31 July 2014

We are interested in explaining neuronal network development through visualizations that summarize trends in large data. We utilized previously-recorded spiking patterns of embryonic rat cortex cells grown on multielectrode arrays [1]. We present results for batch 1 culture 3. Recordings were divided into 100 17.7 s intervals (the

time required to sequentially stimulate each electrode at 0.3 s intervals). In our representation, each trail depicts an interval. The first 50 intervals recorded spontaneous activity (1-25 in red, 26-50 in pink); the last 50 intervals, activity in response to electrical stimulation (51-75 in green, 76-100 in blue). Each trail begins at the origin,



\* Correspondence: Charles.Bergeron@acphs.edu

<sup>1</sup>Analytics Lab, Albany College of Pharmacy and Health Sciences, Albany, NY, 12208, USA

Full list of author information is available at the end of the article

and moves by 1 unit in a direction determined by the electrode detecting it. Longer trails indicate more active intervals. After 4 days in vitro (div) (Figure 1B), activity is scattered and minimal. At 10 div, spiking is more frequent (Figure 1C). Spontaneous activity shows some consistency, as does the stimulated activity, but they differ. At 24 div, spontaneous and stimulated patterns are similar (trails are oriented in the same direction); stimulation provokes many more spikes (Figure 1D). We continue to assess the value of these visualizations in terms of biological characterization.

#### Authors' details

<sup>1</sup>Analytics Lab, Albany College of Pharmacy and Health Sciences, Albany, NY, 12208, USA. <sup>2</sup>Neural Stem Cell Institute, Rensselaer, NY, 12144, USA.

Published: 21 July 2014

#### Reference

1. Wagenaar DA, Pine J, Potter SM: An extremely rich repertoire of bursting patterns during the development of cortical cultures. *BMC Neurosci* 2006, **7**(11).

doi:10.1186/1471-2202-15-S1-P209

Cite this article as: Vachon *et al.*: Visualizing spike activity during neuronal network development. *BMC Neuroscience* 2014 **15**(Suppl 1):P209.

Submit your next manuscript to BioMed Central  
and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at  
[www.biomedcentral.com/submit](http://www.biomedcentral.com/submit)

