Beggs and Haldeman Reply: At the time that our Letter [1] was published, our understanding of the effects of picrotoxin on cultured cortical slices was based entirely on information given to us by Dr. Plenz. Dr. Beggs never saw the original data for the picrotoxin experiments; he states that he was never given access to the data. However, these results were later jointly published by Beggs and Plenz [2], where we stated that picrotoxin induces epileptic activity: ''Reduction in inhibition in the presence of the $GABA_A$ receptor antagonist picrotoxin destroys the power law and renders the event size distribution bimodal. Note the presence of a large hump at higher values, indicating epileptic discharge'' (in the caption to Fig. 4, p. 11 172 of Ref. [2]). Later in the same paper, we introduce the branching parameter σ and note that epileptic activity can be modeled by an increase in σ: ''If $\sigma > 1$, the size of the avalanche will grow over time, taking over the network (epilepsy)...'' (in the caption to Fig. 7, p. 11 174 of Ref. [2]). Based on this information and numerous discussions with Dr. Plenz, I (Beggs) assumed that picrotoxin increased the branching parameter σ.

Experiments in our new lab, though, now suggest that the information disclosed in Plenz's Comment [3] is indeed correct: Picrotoxin decreases the branching parameter σ when the data are binned at 4 ms. We agree that it is important that this be clearly stated, and we welcome this new information. However, as stated in Ref. [2], it is necessary to bin the data at a temporal resolution that matches the average propagation time between electrodes. If picrotoxin reduces this average time, it is possible that σ will be underestimated.

In his Comment, Dr. Plenz also questions the validity of the model we present in Ref. [1] because we have incorrectly described the effects of picrotoxin. It is important to realize that our model makes a prediction about σ and the event size distribution, not a prediction about picrotoxin. Picrotoxin was used as an example of an agent that we thought increased σ. The proper way to evaluate the model is to apply agents that actually increase σ and test if they produce a bimodal event size distribution. Recent experiments in our lab suggest that other agents do just this: They increase σ and produce a bimodal distribution of event sizes, as predicted by the model. If our experiments continue to show this effect, then the model will still stand.

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