Inhibition-dominated random networks for stimulus processing in rodent visual cortex

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The visual cortex of rats and mice appears to lack the orderly structure that leads to the very prominent feature maps well-known from cats and monkeys [1]. Therefore, random networks have been suggested as a model of the primary visual cortex in rodents, and it is now known that contrast-independent orientation tuning, for example, emerges naturally as a consequence of the recurrent dynamics of inhibition-dominated spiking neuronal networks in the balanced state [2–5]. This notion finds a lot of support by recent experiments probing the functional physiology of single neurons at the time of eye opening. Later in development, however, feature-specific connectivity emerges in the network [6–8]. In my talk, I will highlight some recent theoretical insight into the inner workings of dynamic random networks during stimulus processing in sensory networks.

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