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Formation of neural connectivity: nature versus nurture

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Neural development leads to the establishment of precise connectivity in the nervous system based on information contained in the genome. By contrasting the information capacities of cortical connectivity and the genome, I will argue that simplifying rules are necessary in order to create cortical connections from the limited set of instructions. Such rules contain compact statistical summary of our prior evolutionary experience and form the blueprint for the cognitive capacity of human brain. I will review the mathematical formalism that can explain a wide range of data on the interplay between molecular and experience-dependent mechanisms of connectivity formation.