CDB SEMINAR

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13:00~14:00 C1F CDB Auditorium

Transcriptional control of midbrain dopaminergic neuron development

Summary

The transcriptional control of dopaminergic differentiation in the midbrain is intensively studied because of the role of midbrain dopaminergic (mDA) neurons in diverse neurological and psychiatric disorders such as Parkinson's disease, attention deficit/hyperactivity disorder and schizophrenia. In recent years, several transcription factors including Otx2, Lmx1a, Engrailed1, Engrailed2, Msx1, Nurr1 and Pitx3 have been shown to regulate either specification or differentiation of mDA neurons. In contrast, the winged helix transcription factors Foxa1 and Fox2 are required for both these processes. Using loss and gain of function studies in mice, our data show that Foxa1 and Foxa2 cooperate to regulate distinct molecular targets during specification and differentiation of mDA neurons. We have carried out chromatin immmunoprecipitation experiments followed by high throughput sequencing to identify direct transcriptional targets of Foxa2 in midbrain progenitors and neurons in order to determine how Foxa2 regulate distinct target genes in these cells. Results from this global analysis of transcriptional targets of Foxa2 will be presented in this talk. Specifically, I will focus on elucidating mechanisms through which Foxa2 regulate different target genes in the mDA neuronal lineage.

[Dr Ang is a prominent scientist in the field of mammalian neural development, who has been producing a series of elegant works using mouse genetics and embryonic manipulations to elucidate the mechanism of region-specific neuronal specification.]

References

Ang, S.-L. (2006). Transcriptional control of midbrain dopaminergic neuron development. *Development* 133, 3499-3506.

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