

SEMINAR  
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Hosted by A/P Christoph Winkler



## Dynamic Changes and Interactions between Cerebrospinal Fluid and Neural Progenitors in Early Brain Development

**By Kevin Fongching Chau**

Harvard Medical School / Boston Children's Hospital, Department of Pathology

Cortical neural progenitors are in contact with cerebrospinal fluid (CSF) in the brain ventricles throughout development. However, very little is known about the composition of the fluid and how it regulates the progenitors, especially around the time of neural tube closure when the ventricular system first develops. In this study, we deciphered how the fluid proteome changes during neural tube closure, and found that CSF promotes the self-renewal of neural progenitors, an effect that is partly attributable to LIF signaling. Surprisingly, we also found that many proteins involved in translation are present in the fluid, and their abundance decrease as development proceeds. This observation reflects changes in the neighboring neural progenitors, as they also show down-regulation of ribosome biogenesis and protein synthesis in the same developmental period. We further revealed that these cellular processes are potentially modulated by the transcription factor MYC, and the nutrient sensing mTOR pathway. Taken together, our study reveals the dynamic nature of CSF and neural progenitors, and how they interact during early stages of embryonic development.