

Les mardis de  
**L'IAB**

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THE ROLE OF PHASE SEPARATION IN  
HETEROCHROMATIN ORGANIZATION

19. NOVEMBER 2024 – 11 AM – LECTURE HALL

Our genome is partitioned into active and inactive domains that are spatially separated from each other. Inactive heterochromatin domains tend to cluster together, and in some species they form visible structures known as chromocenters. Heterochromatin assembly involves the condensation of chromatin and has been suggested to occur via phase separation driven by Heterochromatin Protein 1 (HP1). Despite the recent progress in studying biomolecular condensates, it remains a challenge to detect phase-separated structures in living cells. To address this issue, we have developed a microscopy approach termed MOCHA-FRAP, which can detect the interfacial barrier that distinguishes phase-separated condensates. We used it to probe the properties of chromocenters in mouse cells and to compare them to other structures such as nucleoli. We found that nucleoli show hallmarks of liquid-liquid phase separation, including a barrier that restricts molecular exchange. In contrast, chromocenters lack such a barrier and rather behave like compact chromatin globules. Expression of HP1 from flies and fission yeast in mouse cells creates an interfacial barrier at chromocenters, pointing to an evolutionary adaptation of HP1's propensity to phase-separate. Our results suggest that mammalian cells use different mechanisms to compartmentalize their chromatin, giving rise to different classes of substructures with distinct properties.

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Allée des Alpes, 38700 La Tronche (tram line B, stop : Grand Sablon)  
The seminar is followed by discussions and exchanges with the speaker and a sandwich buffet is offered