Stage Master 2 :
Investigating protein aggregation in mitotic spindle function during aging

During organismal and cellular aging, cells accumulate stress and make mitotic errors, sometimes with disastrous results. This project explores whether aging and stress cause microtubule-associated proteins to aggregate, potentially disrupting the machinery that ensures proper chromosome segregation. In budding yeast, we found that some spindle proteins form aggregates that occasionally stick to the spindle. While most are cleared, persistent aggregates may increase the risk of segregation errors, fueling aneuploidy and cancer in metazoans. We aim to isolate large quantities of aged yeast cells and detect protein aggregation. Live-cell fluorescence microscopy, photobleaching, and photoconversion will assess aggregation, protein turnover, degradation or refolding and the impact on spindle dynamics. Specifically, we will focus on answering the following questions:

1. *How do nuclear aggregates segregate in aging cells?*
2. *Which microtubule-associated proteins form irreversible aggregates?*
3. *Does aging affect spindle dynamics?*

Ultimately, we seek to understand how aging compromises division fidelity and contributes to disease.

Experience in microscopy and/or work with yeast cells, or biochemical assays is an advantage.
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