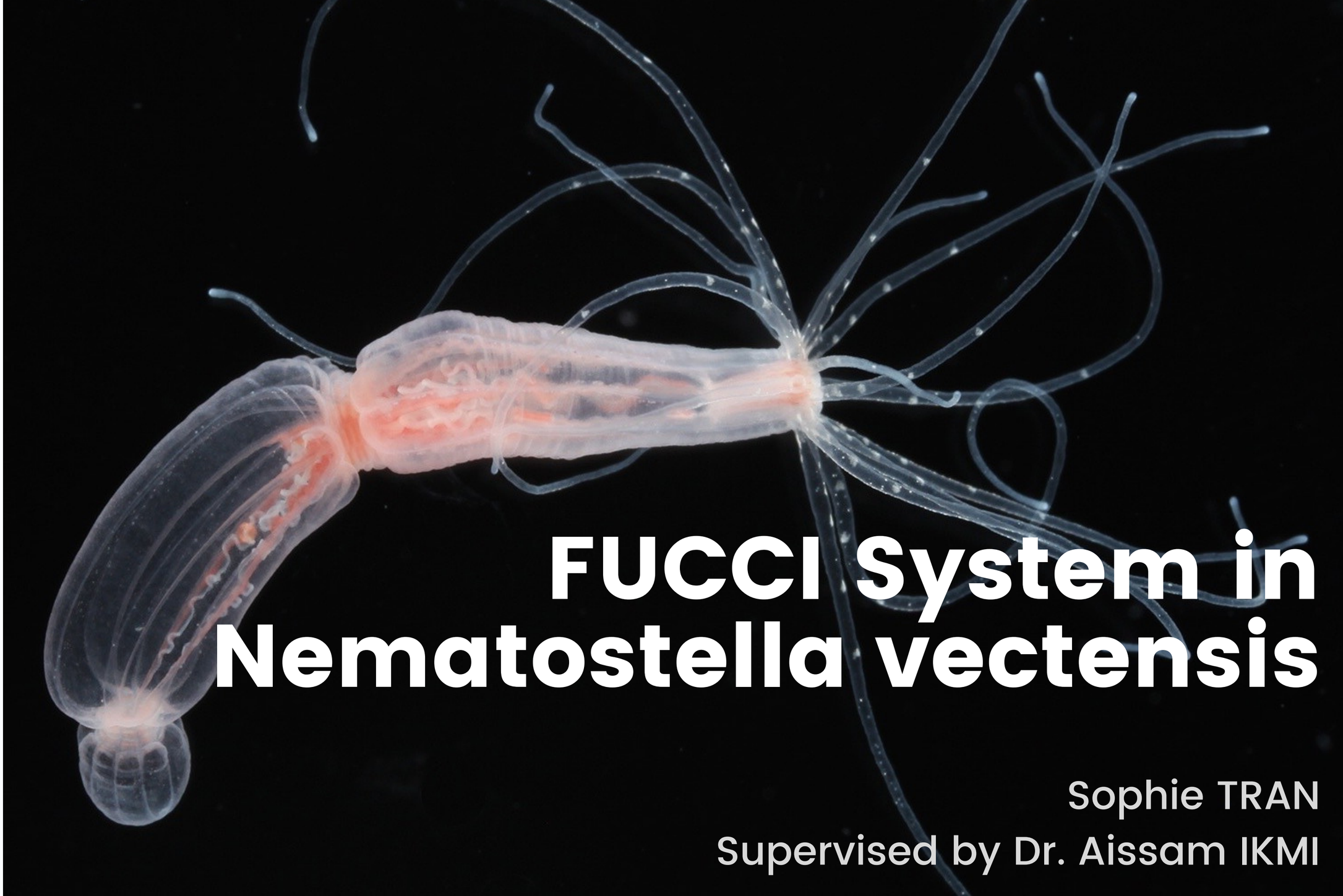
Université de Paris

MAGISTERE EUROPEEN DE GENETIQUE

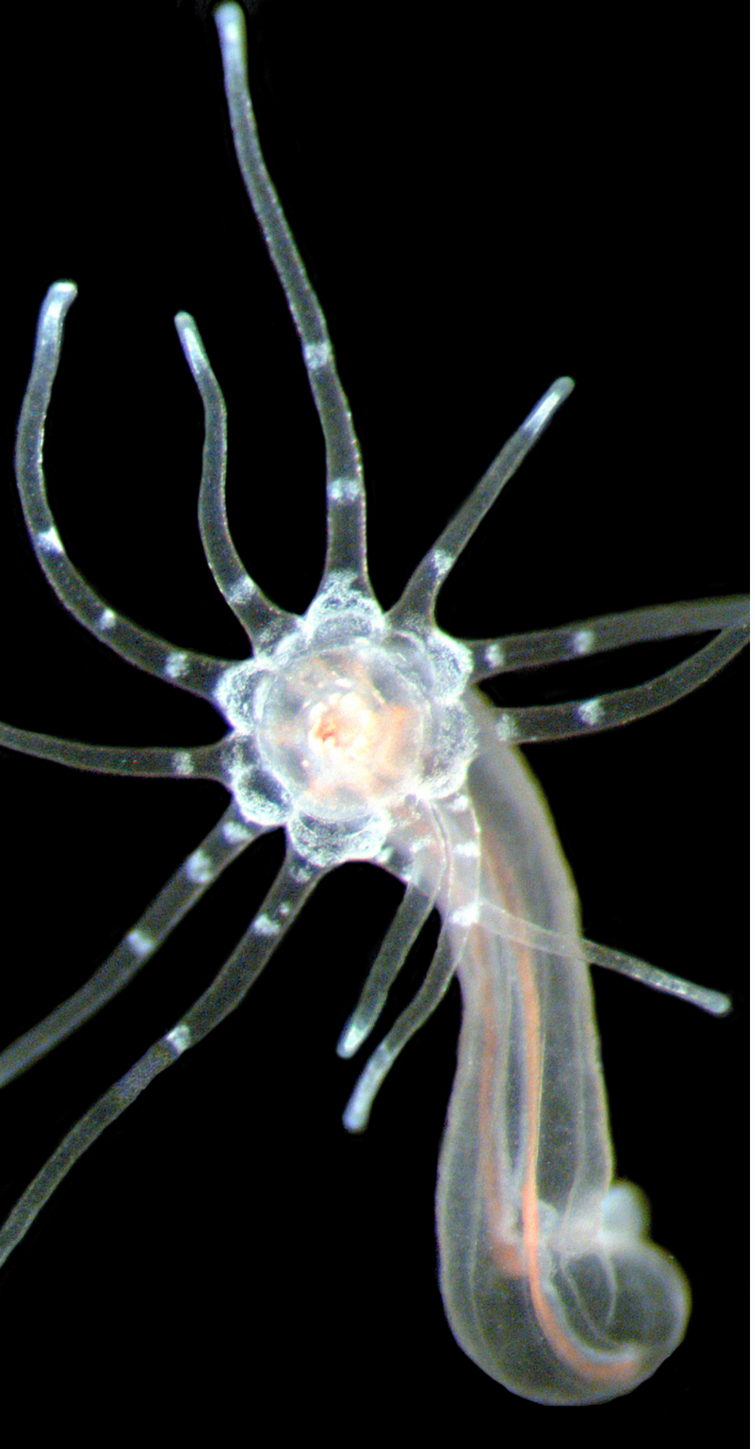
SAPIENZA
UNIVERSITÀ DI ROMA

EMBL

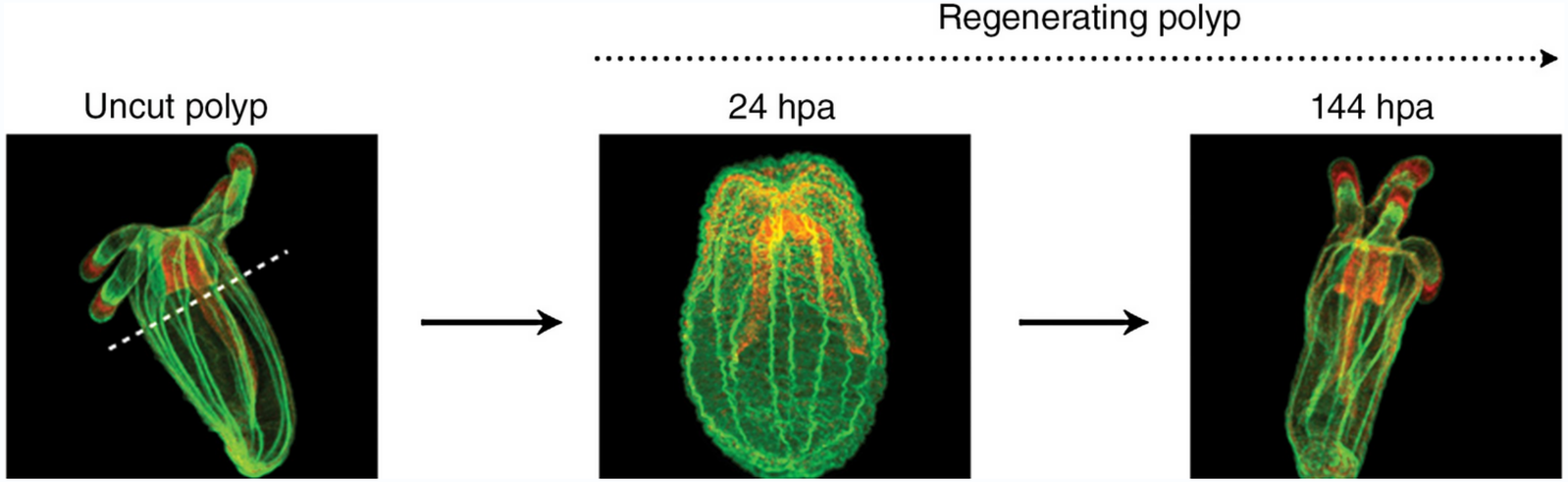


FUCCI System in Nematostella vectensis

Sophie TRAN
Supervised by Dr. Aissam IKMI

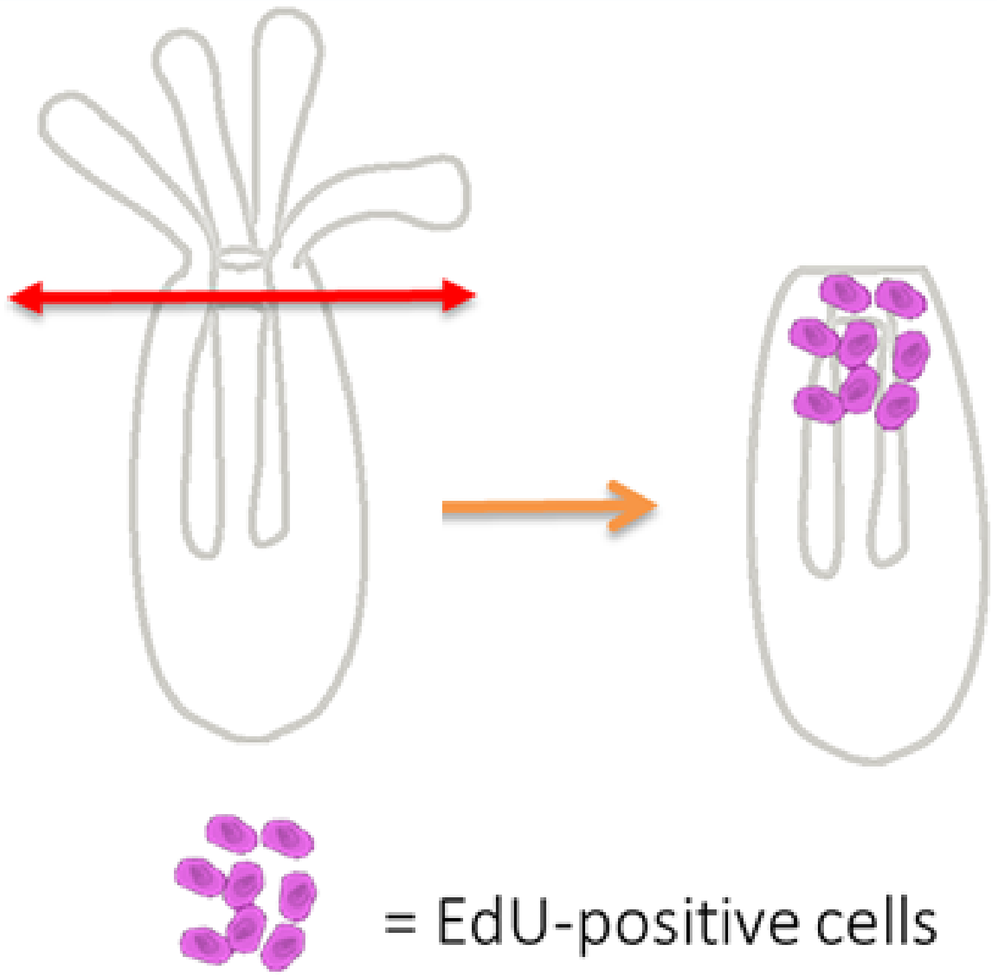


Regeneration in the starlet sea anemone



Oral regeneration of juvenile Nematostella

(Layden et al., 2016)



Localized enrichment of cell proliferation at the oral region during regeneration.

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What are the identities of the proliferating cells?

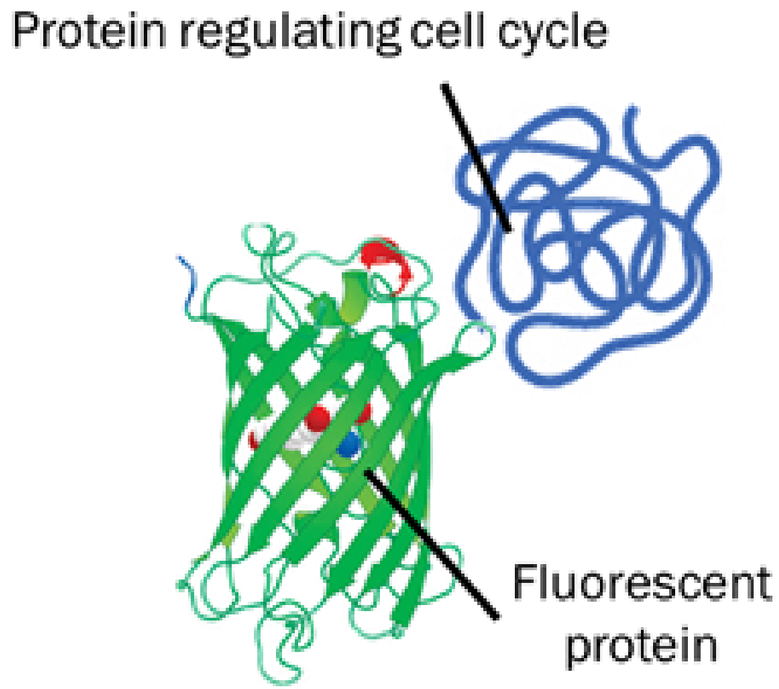
What is the role of the proliferating cells during regeneration?

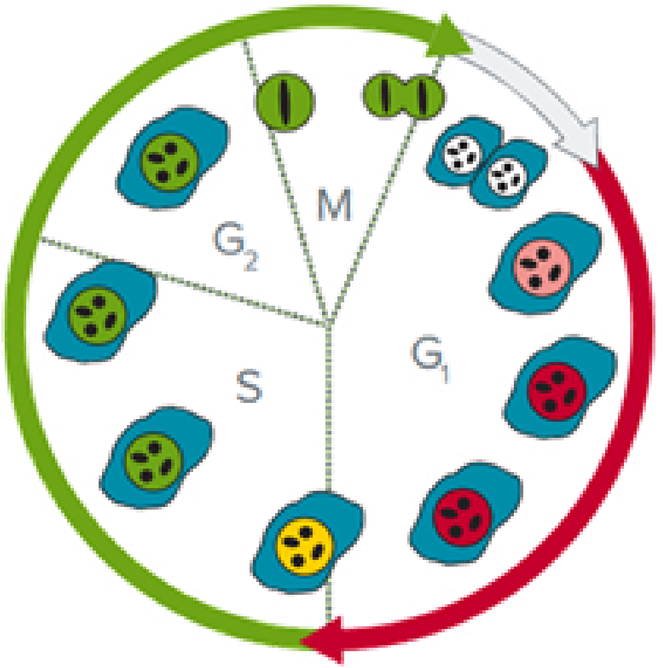
How to track these cells ?

FUCCI

FLUORESCENT UBIQUITINATION BASED CELL CYCLE INDICATOR

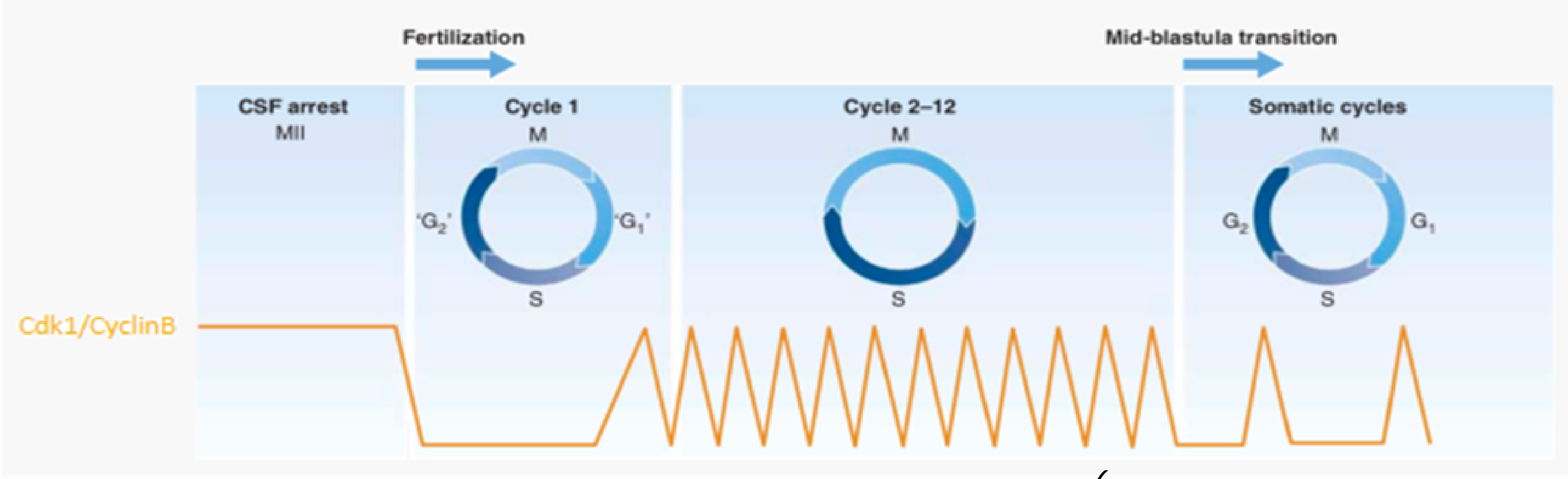
The FUCCI System enables visualization of cell cycle progression in living cells





Strategy of validation

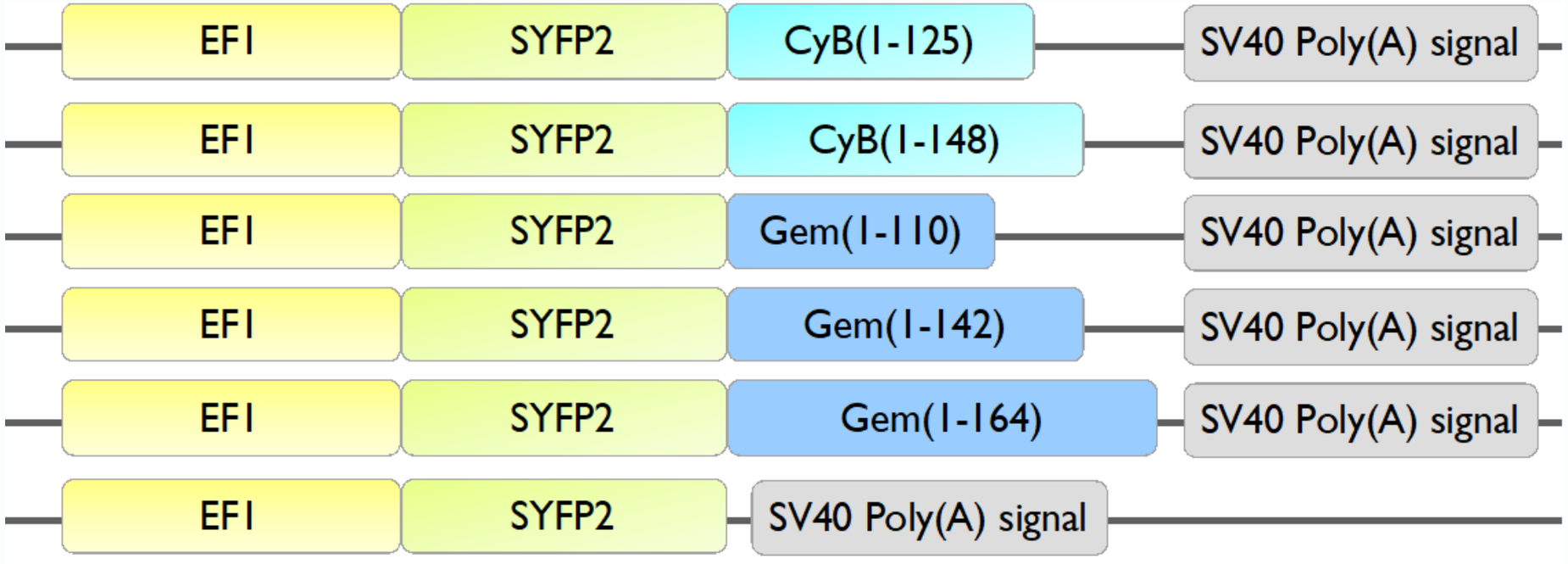
Oscillations of fluorescence intensity during early cell divisions



(Hormanseder et al., 2013)

Strategy of validation

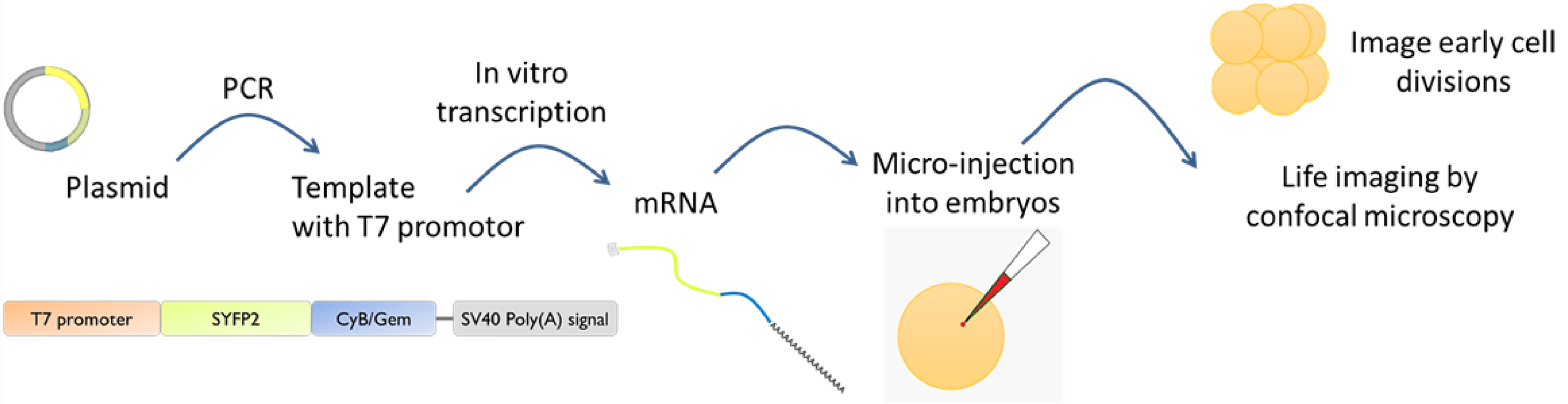
01 Restriction enzyme based molecular cloning



SYFP2-Cyclin B
SYFP2-Geminin
SYFP2 only

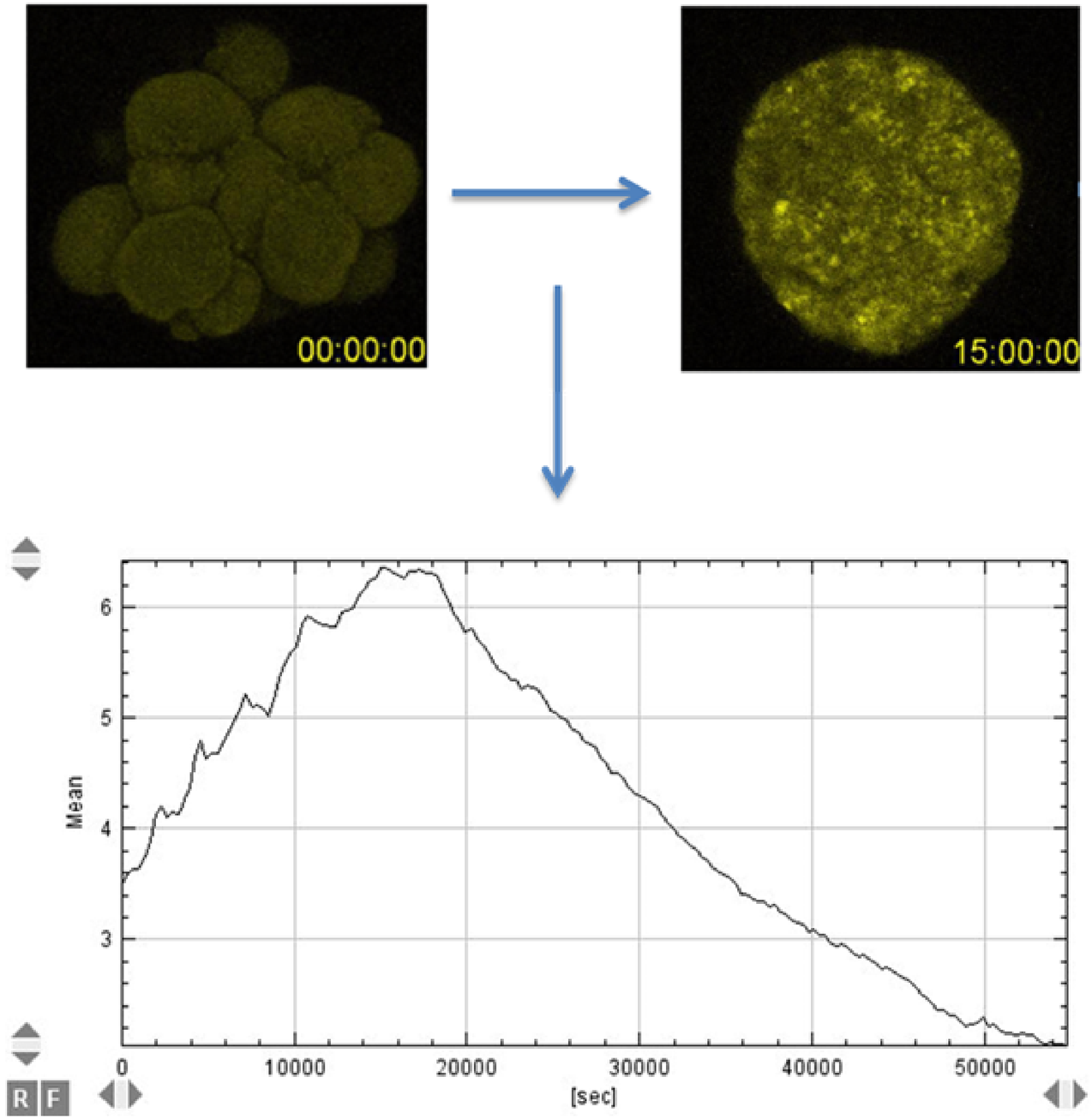
Strategy of validation

02 Imaging the early cell divisions

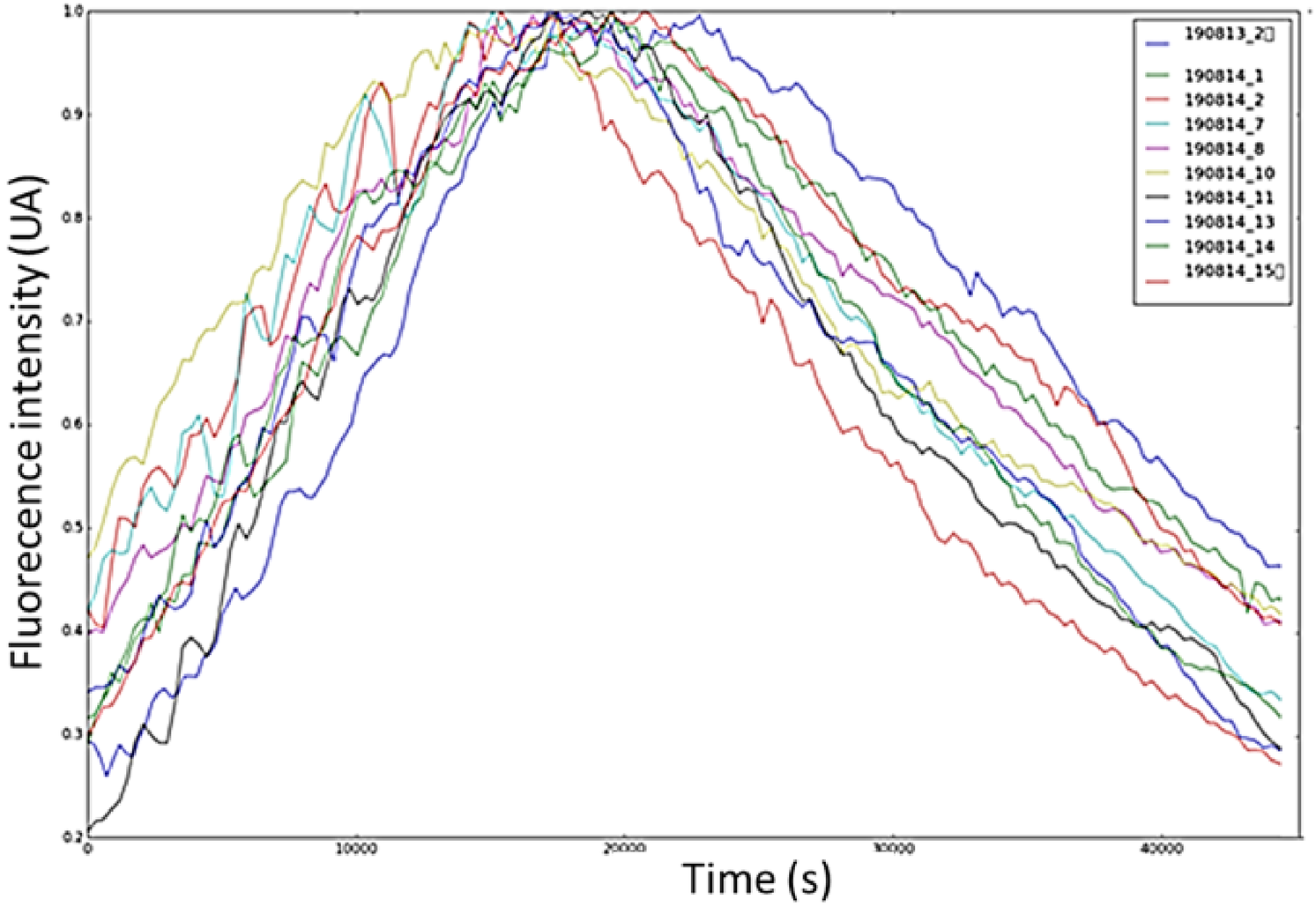


RESULTS

After overnight imaging, we obtain a video of each embryo, and we extract the intensity of the fluorescent signal over time.



Results for SYFP2-Geminin(1-110)



Oscilations of the fluorescence

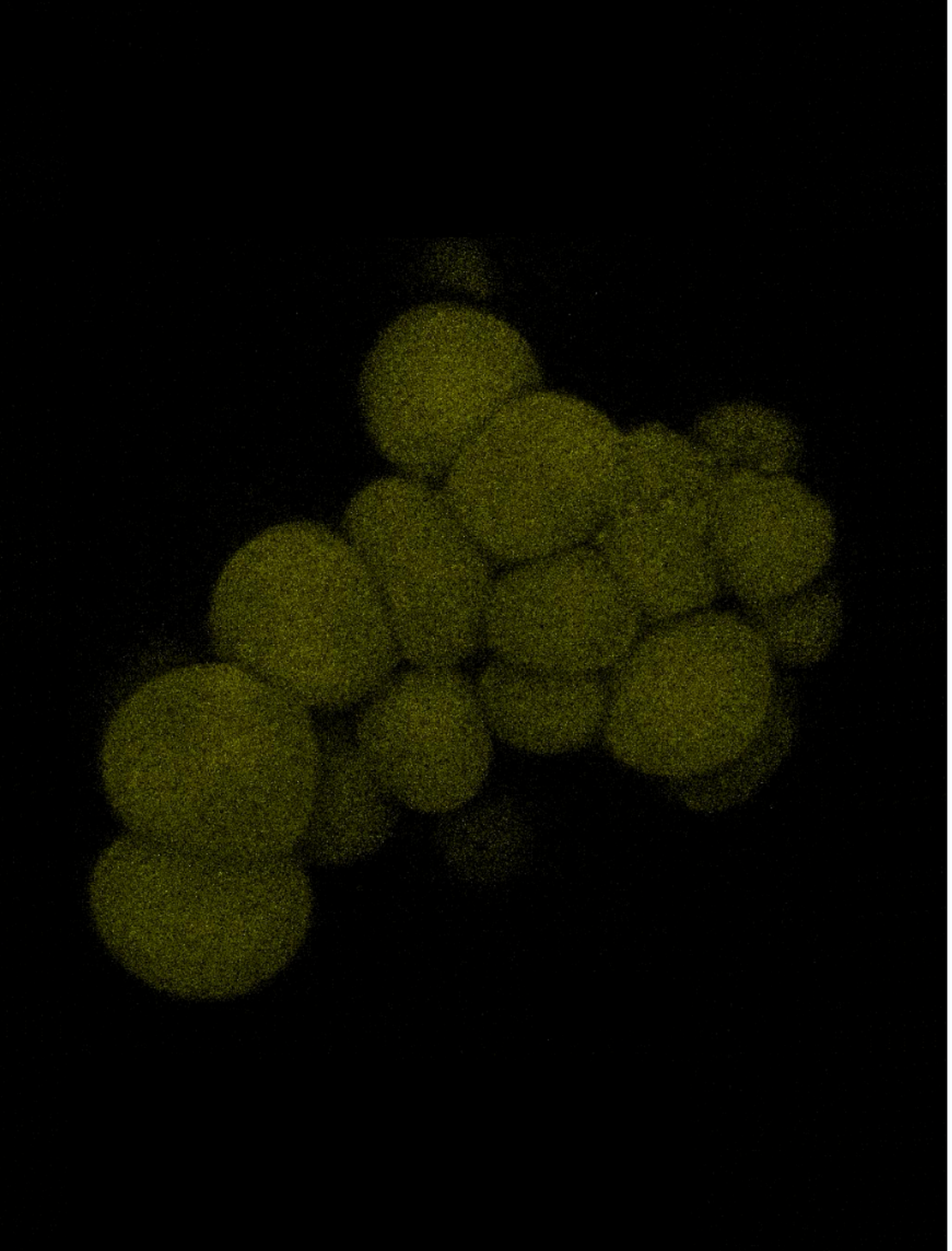
Small oscillations are observed during the initial 4-5 hours that correspond to the synchronized cell divisions.

Accumulation of the fluorescence

The accumulation of fluorescent signal was unexpected. But in Xenopus it has been shown that geminin is not fully degraded during early embryogenesis.

Other cell cycle reporters

The reporters with larger fragments of geminin were lethal in early embryos likely because they retained the functional domain of geminin.



CONCLUSION & OUTLOOK

SYFP2-Geminin(1-110) is a promising cell cycle reporter

Generate a transgenic line with this reporter to validate it in adult tissue

Thank you for your attention