MCB 150
The Molecular and Cellular Basis of Life

The Nucleus, Progeria, and Making Connections

Today’s Learning Catalytics Session ID is: **11769868**

**Announcements:**

- Exam II answer key is posted in MasteringBiology
- If you have questions about the grading of your exam, contact Melissa Reedy in 208 Noyes next week
- If you have questions about the problems on the exam, please visit my office hours or talk to me after class
- Conflict exams are available in 252 Davenport
- Today is drop deadline
  - Express Advising for biology majors until 4:45 in 127 Burrill Hall
The nuclear lamina is made up of lamin proteins:

- 3 types: A, B, and C
- Lamin A and Lamin C are alternatively spliced from \( LMNA \) gene

\( LMNA \) gene is in this region

Chromosome 1
In Lamin A (but not C), a lipid entity called a farnesyl group gets attached to the protein

- Lamin A is initially attached to the nuclear envelope
- The farnesyl group is then removed, and the resulting protein is free to be an unbound component of the lamina

A single point mutation in a 57,000 bp-long gene leads to an inability to become de-farnesylated

- This mutation activates a cryptic splice site
- The resulting mis-processed protein is called Progerin

Chromatin organization is critical for cell division

- Progerin stays attached to the envelope, weakening the lamina and the entire nuclear envelope
- Weakening of the lamina limits the cell’s ability to divide
A connection with telomeres

- Progerin is found in normal cells in low amounts
- As cells age, shortened telomere length activates increased Progerin levels, further aging the cells

Hope for the future?

- Farnesyltransferase inhibitors (FTIs) are in Phase II clinical testing, and have shown positive results in every one of the 28 children involved in the study so far