

Elizabeth Blackburn - Telomeres

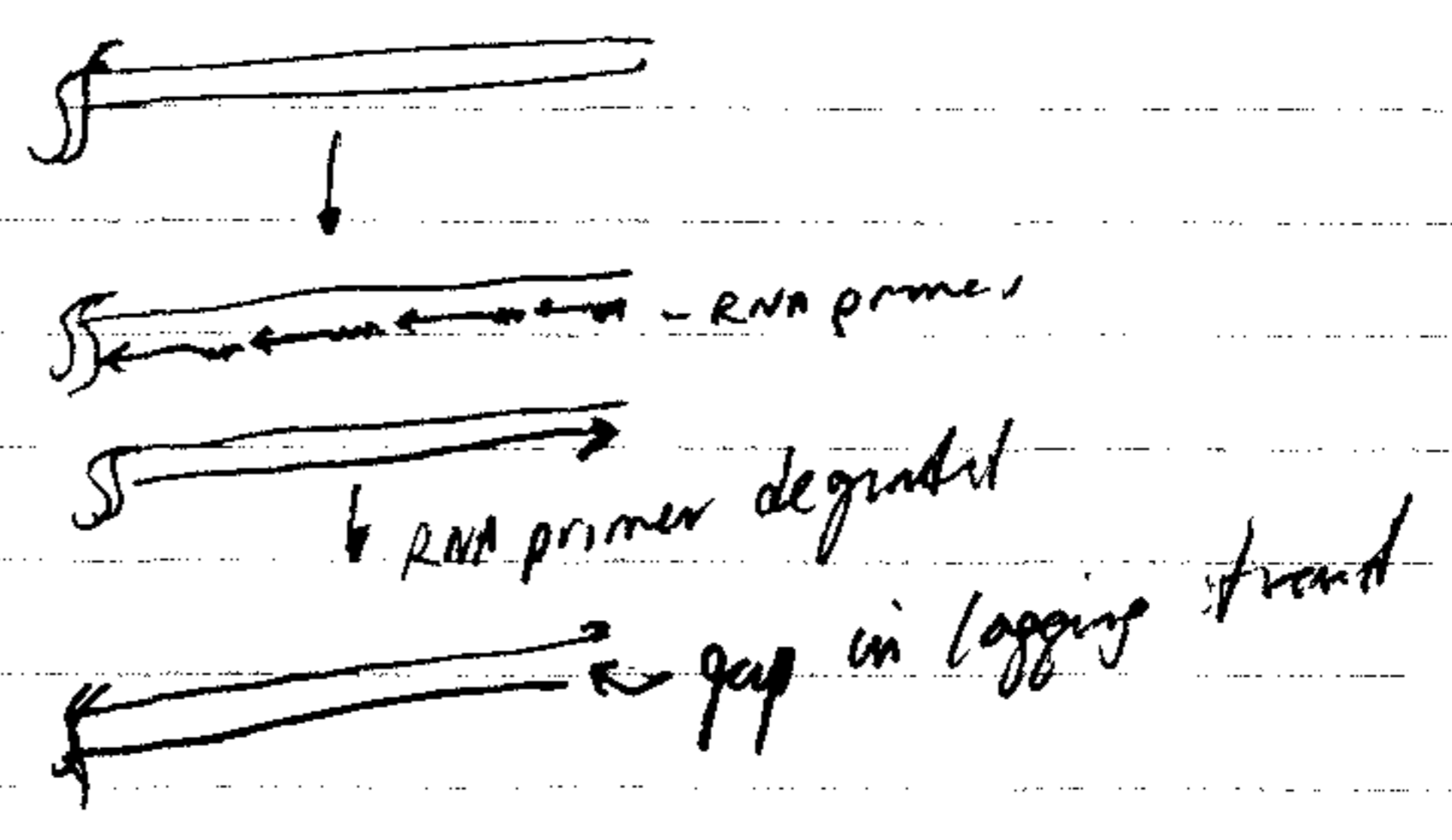
Eukaryotic telomeres

- tandem repeats (3-10,000 repeats)

- AGGTT human
- AGGT giardia
- AGGTTT Arabidopsis
- GGGTT Tetrahymena

- (x)

- chromosome cap
- mediate chromosome-chromosome interaction
- reqd. for complete replication



- Solution is to add DNA to end to compensate for loss

- Tetrahymena

- micronuclei & macronuclei

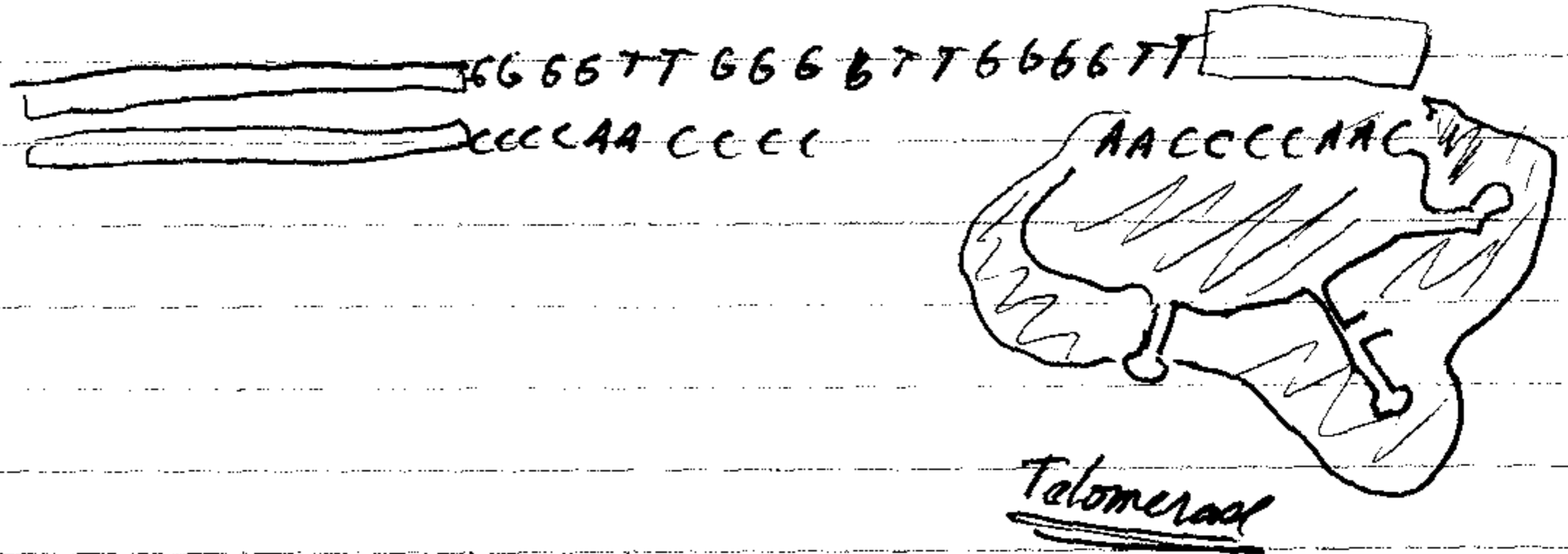
Macronucleus Dolphins

micronucleus 5 chromosomes = diploid

↓
 □ □ □ diff. macronucleus (many deletions)

↓
 □ □ □ mature macronucleus (telomeres added)

Telomerase



Mutations in telomerase

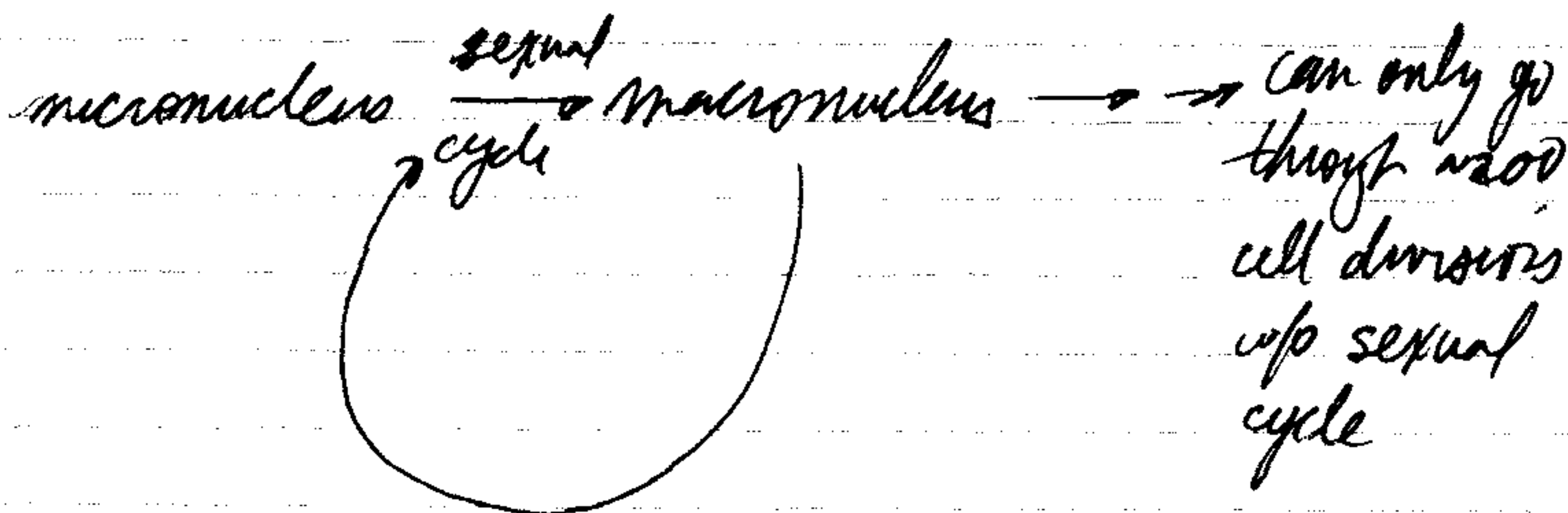
- some lead to telomeres being shortened over time & then cell death

- AACCCCAAC

↓

infant AACCCAAC → 50% misincorporation at two Cs

Paramecium



- some type of senescence (gradual worsening)

- but telomeres don't change
- but rDNA gets degraded over time

Yeast telomeres

- K. lactis 25 bp repeat - probed & cloned

- appears that there is some type of back-up pathway that can make telomeres longer even w/o telomerase (maybe recombination)