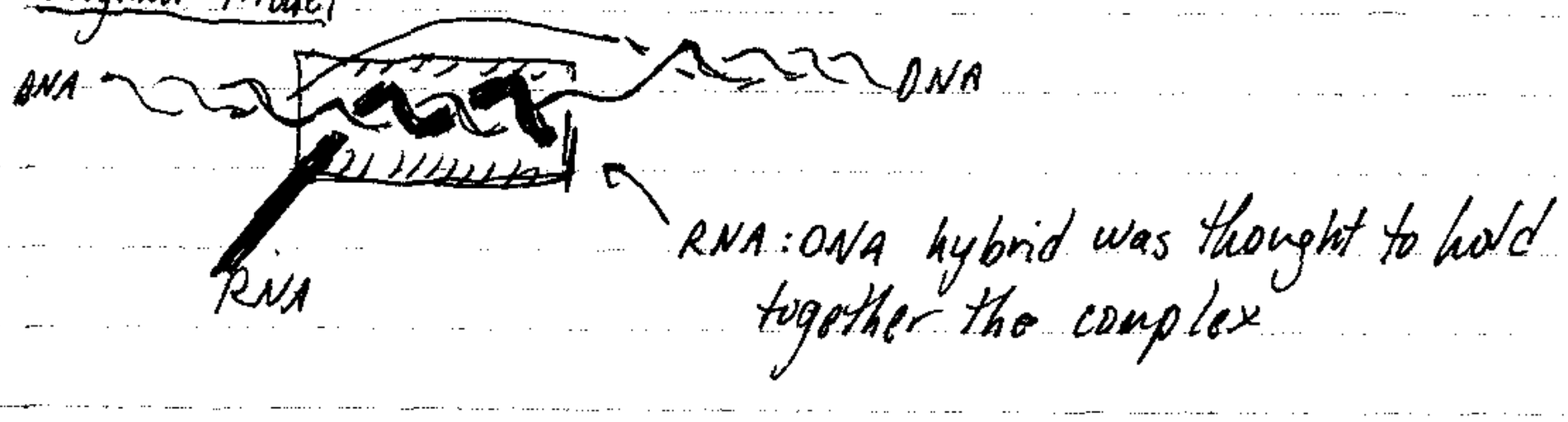
Mike Chamberlin : E. coli RNA polymerase "termination signal" recognition

Transcription ... 4 major stages

binding → initiation → elongation → termination

Original Model



Krummel & Chamberlin

INCHWORM
1. DNAase 1 footprint does NOT move successively as each nucleotide is added
2. then w/ more addition get the normal size footprint
3. there is NO stable 12bp DNA:RNA hybrid
4. when polymerase is stopped by missing nucleotide re-addition did not always allow for re-elongation
5. transcript cleavage by RNA polymerase

Tx cleavage

- required Mg^{++}
- rapid release of 1-12 nt from 3'-OH
- 5' end stays attached
- GreA & GreB stimulate cleavage (NOT required)
- only occurs when in tx. complex

To arrest complexes
- to restart ⇒ need cleavage

SINCE THE 3' END GETS CLEAVED... SUGGESTS NO RNA:DNA HYBRID AS THOUGH.

Inchworm model
- two RNA binding sites
- two DNA binding sites
- lock 1 ... let other slide

RNA polymerase is not distributive ... it cannot restart after falling off.

Terminators
- when translocated forward w/ terminator in 2nd site ... gets jammed up and cannot extend

- SII

Cleavage
- requires SII in yeast