LIBRARY SYNTHESIS - COMPLEMENTARY DNA (cDNA)
A. CONVENTIONAL PROCEDURE

FL Messenger RNA (mRNA)

——————————————————————— AAAAAA

——————————————————————— AAAAAA
←——————————————————————— TTTTTT

————————————————————→ AAAAAA
——————————————————————— TTTTTT

↓ S1 Nuclease

Short cDNA

——————————————————— AAAAAA
——————————————————— TTTTTT
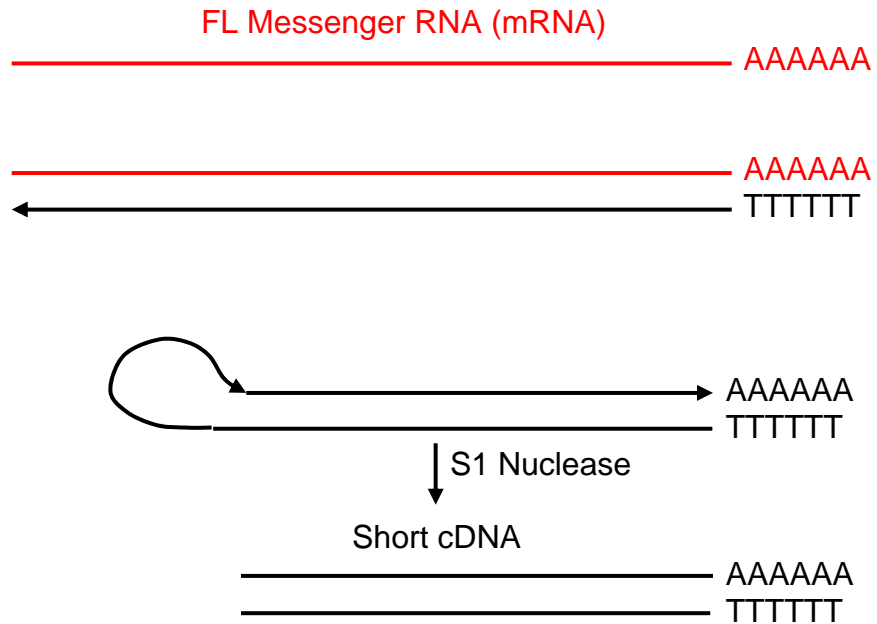
RESULT:
- Incomplete replication
- Truncated gene sequence
- Truncated protein sequence
- Absence of protein function
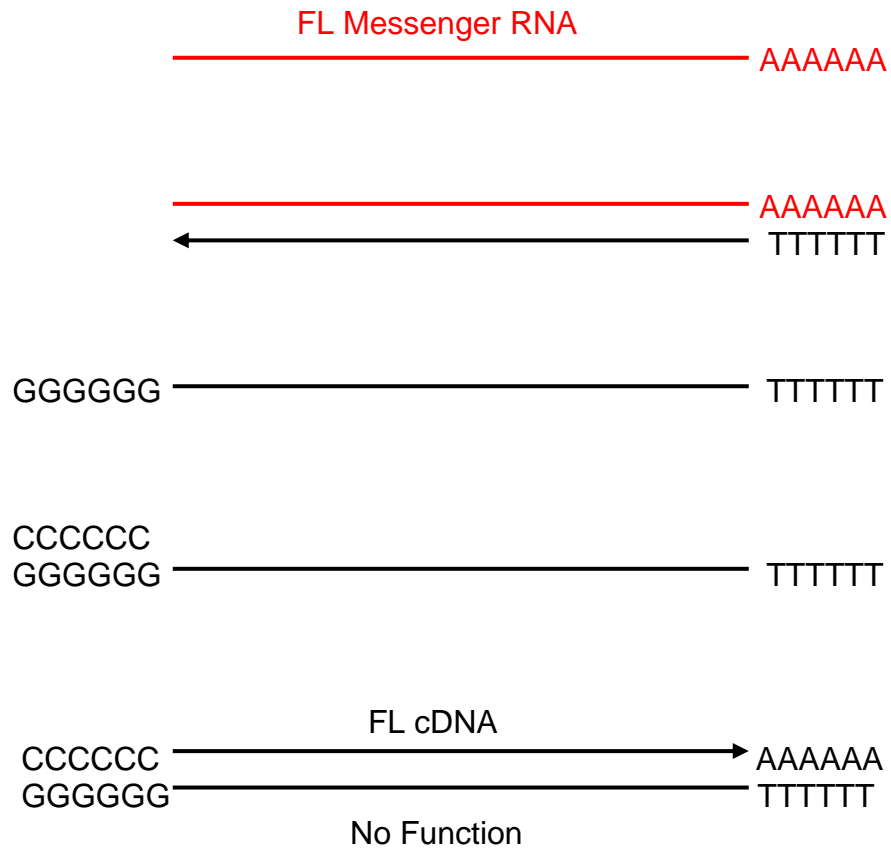
KEY:
RED = mRNA
BLACK = cDNA

USE:
- Partial gene & protein sequence
- Partial bioinformatics analysis

DEFICIT:
- Truncated gene
- Truncated protein with no function

PROTECTION: Public Domain

LIBRARY SYNTHESIS - COMPLEMENTARY DNA (cDNA)
B. FULL-LENGTH (FL) PROCEDURE
(G-C TAILING)

FL Messenger RNA ———————————— AAAAAA

———————————— AAAAAA
◄———————————— TTTTTT

GGGGGG ———————————— TTTTTT

CCCCCC
GGGGGG ———————————— TTTTTT

FL cDNA
CCCCCC ————————————► AAAAAA
GGGGGG———————————— TTTTTT
No Function

RESULT:
- Complete replication
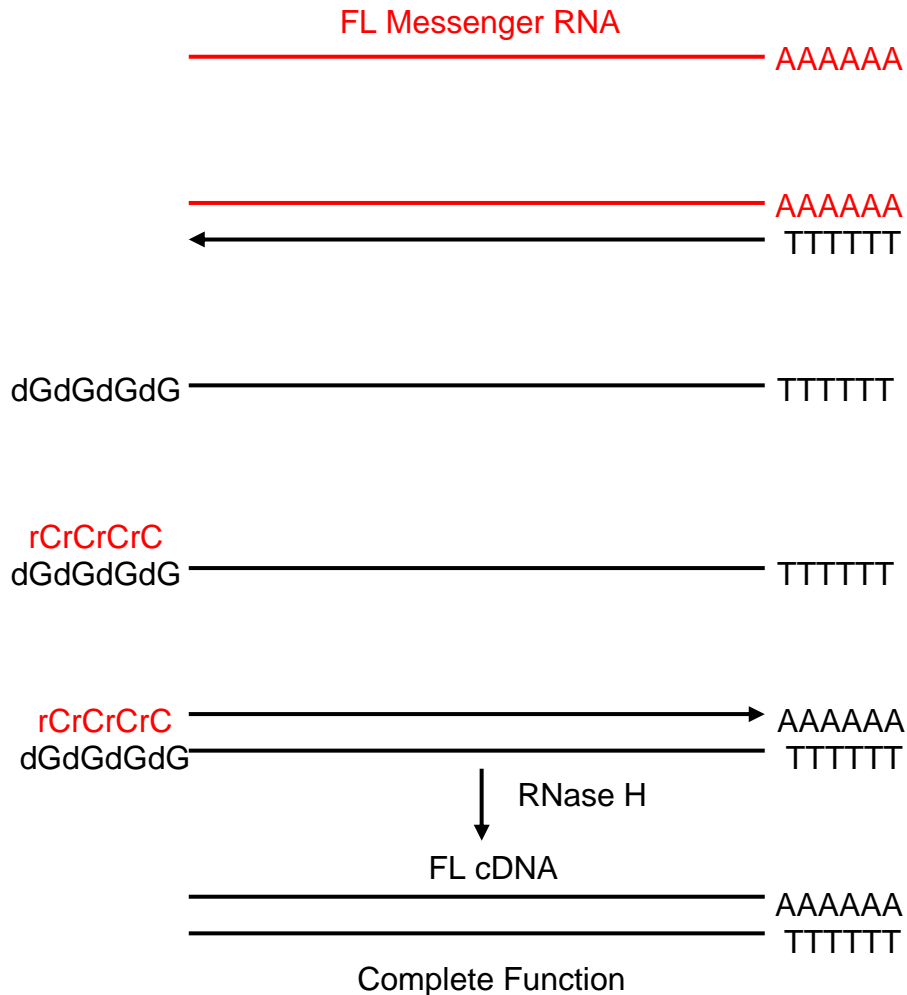- Full-length gene

KEY:
RED = mRNA
BLACK = cDNA

USE:
- Complete structure of gene & protein
- Complete bioinformatics analysis

DEFICIT:
- Absence of function
  - ➢ Defect in gene transcription
  - ➢ Defect in protein synthesis

PROTECTION: Proprietary (AlphaGene)

LIBRARY SYNTHESIS - COMPLEMENTARY DNA (cDNA)
C. FULL-LENGTH EXPRESSION (FLEX) PROCEDURE
(REVERSIBLE G-C TAILING)

FL Messenger RNA ————————————— AAAAAA

————————————— AAAAAA

←————————————— TTTTTT

dGdGdGdG ————————————— TTTTTT

rCrCrCrC
dGdGdGdG ————————————— TTTTTT

rCrCrCrC ————————————→ AAAAAA
dGdGdGdG ————————————— TTTTTT

↓ RNase H

FL cDNA

————————————— AAAAAA
————————————— TTTTTT

Complete Function

RESULT:
- Complete replication
- Full-length gene & protein
- Complete gene & protein function (protein folds up correctly)

USE:
- Complete structure of gene & protein
- Complete bioinformatics analysis
- Efficient synthesis of gene & protein
- Complete function in protein

KEY:
RED = RNA
BLACK = DNA

DEFICIT: None

PROTECTION: Two patents issued (AlphaGene)