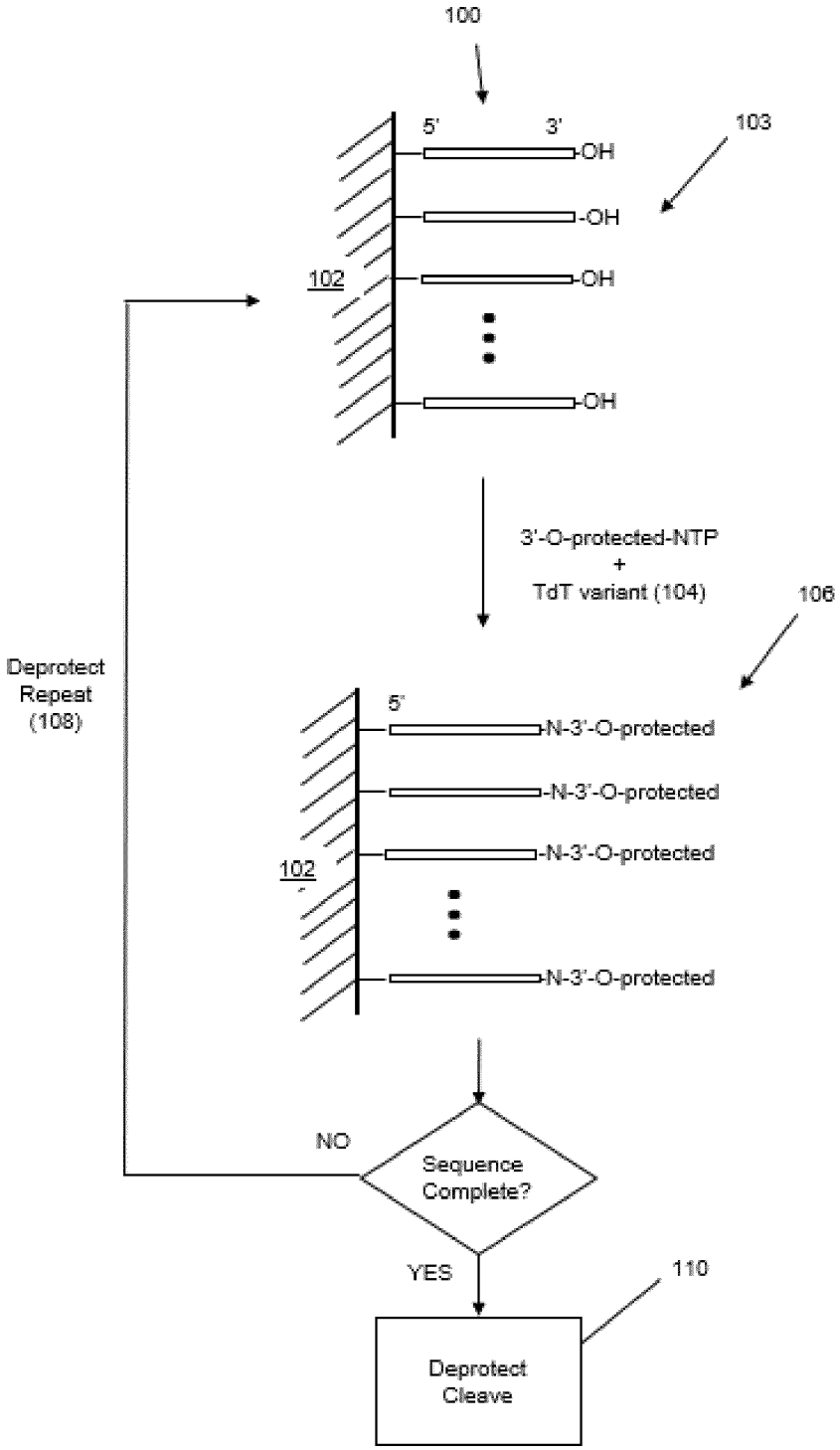

100
5'
3'
OH
-OH
OH
OH
103
102
3'-O-protected-NTP
+
TdT variant (104)
106
Deprotect
Repeat
(108)
5'
N-3'-O-protected
-N-3'-O-protected
-N-3'-O-protected
N-3'-O-protected
102
NO
Sequence
Complete?
YES
110
Deprotect
Cleave

FIGURE 1

Table 1

SEQ ID NO	Supplemental Substitutions												
1	L181F/A/M/Y	M192R/Q	A237V	L260P/R/K	C302G/R	R336L/N	G413L/S	E418A/V	R454P/N/A/V	E457N/L/T/S/K	R480K/E/D
3	L52F/A/M/Y	M63R/Q	A108V	L131P/R/K	C173G/R	R207L/N	G284L/S	E289A/V	R325P/N/A/V	E328N/L/T/S/K	R351K/E/D
4	---	M63R/Q	A110V	L131P/R/K	C173G/R	R207L/N	---	---	R324P/N/A/V	E327N/L/T/S/K	R353K/E/D
5	---	M63R/Q	A110V	L131P/R/K	C173G/R	R207L/N	---	E294A/V	R324P/N/A/V	E327N/L/T/S/K	R353K/E/D
6	---	---	A107V	---	C172G/R	R206L/N	---	E290A/V	R320P/N/A/V	---	---
7	---	M63R/Q	A110V	L131P/R/K	C173G/R	R207L/N	---	E292A/V	R331P/N/A/V	E334N/L/T/S/K	---
8	---	M63R/Q	A110V	L131P/R/K	C173G/R	R207L/N	---	---	---	E328N/L/T/S/K	R354K/E/D
9	---	---	A111V	L132P/R/K	C174G/R	R208L/N	---	---	R331P/N/A/V	E334N/L/T/S/K	---
10	---	M73R/Q	A110V	L131P/R/K	C173G/R	R207L/N	---	E295A/V	R325P/N/A/V	E328N/L/T/S/K	---
11	---	M64R/Q	A111V	L132P/R/K	C174G/R	R208L/N	---	---	---	E329N/L/T/S/K	R355K/E/D
12	---	M61R/Q	A108V	L129P/R/K	C171G/R	R205L/N	G284L/S	E293A/V	R323P/N/A/V	E326N/L/T/S/K	R352K/E/D
13	---	M63R/Q	A110V	L131P/R/K	C173G/R	R207L/N	---	E298A/V	R328P/N/A/V	E331N/L/T/S/K	---
14	---	---	A110V	L131P/R/K	C173G/R	R207L/N	---	E295A/V	R325P/N/A/V	E328N/L/T/S/K	R354K/E/D
15	---	M63R/Q	A110V	L131P/R/K	C182G/R	R216L/N	---	---	R338P/N/A/V	E341N/L/T/S/K	---
16	---	M66R/Q	A113V	L134P/R/K	C176G/R	R210L/N	---	E298A/V	R328P/N/A/V	E331N/L/T/S/K	---

FIGURE 2

Table 2

SEQ ID NO	Stability Substitutions											
1	Q166E	D170R	C188R	L189D	S223R	G227E	S248A	S275E	Q278R	F322Y	V328M	M330V
3	Q37E	D41R	C59R	L60D	S94R	G98E	S119A	S146E	Q149R	F193Y	V199M	M201V
4	--	D41R	--	--	--	--	S119A	S146E	--	F193Y	V199M	M201V
5	Q37E	D41R	C59R	--	--	--	S119A	S146E	--	F193Y	V199M	M201V
6	--	D40R	C58R	L59D	--	--	S118A	--	--	F192Y	V198M	--
7	Q37E	D41R	C59R	L60D	--	--	S119A	--	--	F193Y	V199M	--
8	--	D41R	--	--	--	--	S119A	S146E	--	F193Y	V199M	M201V
9	Q37E	D42R	C60R	--	--	--	S120A	--	--	--	V200M	--
10	--	D41R	--	L60D	--	--	S119A	S146E	--	F193Y	V199M	M201V
11	--	D42R	--	--	--	--	S120A	S147E	--	F194Y	V200M	M202V
12	--	D39R	--	--	S94R	--	--	S144E	--	F191Y	--	M199V
13	--	D41R	C59R	--	--	--	S119A	--	--	F193Y	V199M	M201V
14	--	D41R	--	--	--	--	S119A	S146E	--	F193Y	V199M	--
15	Q37E	D41R	C59R	L60D	S94R	--	S119A	--	--	--	V199M	--
16	--	D44R	C62R	--	--	--	S122A	--	--	F196Y	--	--

FIGURE 3