Description: The 5' terminal m7G cap present on most eukaryotic mRNAs promotes translation in vitro at the initiation level (2,3,4). For most RNAs, elimination of the cap structure causes a loss of stability, especially against exonuclease degradation (5), and a decrease in the formation of the initiation complex of mRNAs for protein synthesis (5,6). Certain prokaryotic mRNAs containing a 5' terminal cap structure are translated as efficiently or more efficiently than eukaryotic mRNAs in an eukaryotic cell-free protein synthesizing system (6). Also a cap requirement has been observed for splicing eukaryotic substrate RNAs (7).

A method using E. coli RNA Polymerase primed with m7G(5')ppp(5')G or m7G(5')ppp(5')A for an efficient in vitro synthesis of capped RNAs has been developed by Contreas (8). Larger amounts of capped RNAs are produced by transcription systems using SP6 RNA Polymerase primed with m7G(5')ppp(5')G (7).

Note: Addition of 131 µl water gives approximately a 10 millimolar solution.

References: