translation factors eIF4E and eIF4G of the eIF4F complex. This complex is then recognized by other translation initiation machinery including the ribosome.

2. Prevention of degradation by exonucleases

Capping with 7-methylguanylate prevents 5' degradation in two ways:

- First, degradation of the mRNA by 5' exonucleases is prevented by functionally looking like a 3' end.
- Second, the CBC and eIF4E/eIF4G block the access of decapping enzymes to the cap.

This increases the half-life of the mRNA, essential in eukaryotes as the export and translation processes take significant time.

3. mRNA translation.

The 5' capping is also involved in the binding of the mRNA to the ribosomes to initiate translation. The first mRNA-dependent step of translation is the binding of the eIF4F complex to the 7-methylguanosine cap, which is mediated by the eIF4E subunit. eIF4E has a significantly higher affinity for the 7-methylguanosine cap than the unmethylated guanosine cap, and this has been hypothesized to prevent free cellular GTP from interfering with translation initiation. 7-methylguanylate cap is a marker of an actively translating mRNA

4. Promotion of 5' proximal intron exection tess

The mechanism of 5' proximal infort excision promotion is not well understood, but the 7methylguanylate cap explores to loop around an explored with the spliceosome in the splicing process promoting meon excision.

5. Stability

Methylation of the mRNA guanosine cap also has the potential to indirectly regulate mRNA stability. The capping reaction catalysed by the guanylyltransferase is reversible, and the product of the back reaction, uncapped mRNA, is degraded rapidly by exonucleases. Once the guanosine cap is methylated, it is no longer a substrate for the guanylyltransferase, and, since cap methylation appears to be irreversible, it indirectly stabilizes the RNA