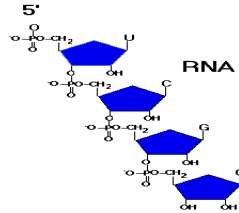


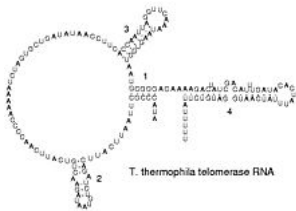
Structure and Synthesis of RNA

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Structure of RNA



RNA is distinguished from DNA in the presence of a [hydroxyl](#) group at the 2' position of the ribose sugar. The functional group causes the helix rather than the DNA's B-form which is observed normally. This causes a very deep and narrow major groove and a shallow and wide minor groove.



A second consequence of the presence of the 2'-hydroxyl group is that in conformationally flexible regions of an RNA molecule it can chemically attack the adjacent phosphodiester bond to cleave the backbone.

RNA has (A C G U) four bases (adenine, cytosine, guanine and uracil). Apart from this there are many modified bases and sugars also present in mature RNAs. The role of these modified bases is still not known. In rRNA (ribosomal RNA), in highly functional and coding regions only the post-transcriptional modifications occur.

In the single stranded RNA molecules functional forms are present. They require a specific [tertiary structure](#). Secondary structural elements provide the scaffold for this tertiary structure.

[Hairpin loops](#), bulges and internal loops are the several recognizable "domains" of secondary structures.

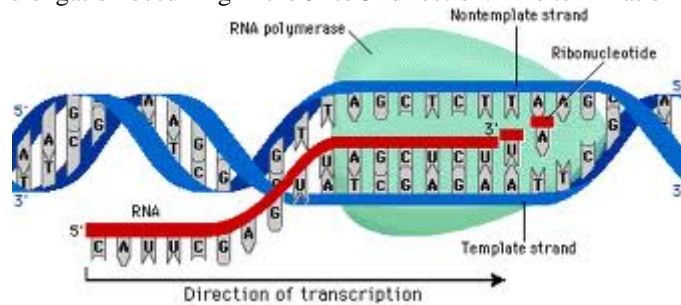
Synthesis of RNA

This synthesis reaction is catalyzed by the enzyme RNA polymerase. This is happening by a process known as transcription. By using DNA Template the transcription process happens.

This transcription has three steps.

- **Initiation**
- **Elongation**
- **Termination**

Initiation process of transcription begins when the enzyme binds to the [promoter](#) sequence in the DNA. This enzyme helicase unwound the double helix. Then the enzyme progresses along the template strand in the 3' to 5' direction. It will be synthesizing a complementary RNA molecule with elongation occurring in the 5' to 3' direction. The termination of RNA synthesis occurrence



is dictated by the DNA sequence.

After transcription process normally the RNAs are often [modified](#) by enzymes. The splisosome which removes the pre mRNA and introns which are added with [poly\(A\) tail](#) and a [5' cap](#).

For the synthesis of a new strand of RNA, the [RNA-dependent RNA polymerases](#) use RNA as their template.

A number of RNA viruses use RNA polymerase to replicate their genetic material. For example, poliovirus. Also in many organisms, this enzyme is part of the [RNA interference](#) pathway.

Want to know more about RNA synthesis process? [Click here](#) to schedule live online session with e Tutor!

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Reference Links:

- <http://en.wikipedia.org/wiki/RNA>
- <http://www.youtube.com/watch?v=7oaoOUpMswc>
- <http://www.whatislife.com/reader/dna-rna/dna-rna.html>
- http://www-scf.usc.edu/~chem203/resources/DNA/rna_structure.html
- [http://en.wikipedia.org/wiki/Transcription_\(genetics\)](http://en.wikipedia.org/wiki/Transcription_(genetics))
- <http://www.youtube.com/watch?v=NJxobgkPEAo>

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