**Similarity of regulation between eukaryotes and prokaryote**

1、Principles are the same: signals, activators and repressors, recruitment and allostery（变构）, cooperative binding

2、Expression of a gene can be regulated at the similar steps, and the initiation of transcription is the most pervasively regulated step.

**Difference in regulation between eukaryotes and prokaryote**

1. Pre-mRNA splicing adds an important stepfor regulation.

2. The eukaryotic transcriptional machineryis more elaborate than its bacterial counterpart.

3. Nucleosomesand their modifiers influenceaccess to genes.

4. Many eukaryotic genes have more regulatory binding sites and are controlled by more regulatory proteins than are bacterial genes.

**cis-regulatory element**

A cis-regulatory element or cis-element is aregion of DNA or RNA that regulates the

expression of Genes located on that same strand. This term is constructed from the

Latin word cis, which means "on the same side as". These cis-regulatory elements are

often binding sites of one or more trans-acting factors. A cis-element may be located in the promoter region 5' to the gene it controls, in an intron, or in the 3'untranslated region.

**Trans-regulatory elements**

Trans-regulatory elements are species which may modify the expression of genes distant

from the gene that was originally transcribedto create them. To demonstrate the concept

(this is not a specific example), a transcription factor which regulates a gene

on chromosome 6 might itself have been transcribed from a gene on chromosome 11.

This term is constructed from the Latin root -trans, which means "across from".

**Expound the general mechanism of control of gene expression of Eukaryotes???**