BIO-302 MOLECULAR BIOLOGY MCQs FOR FINAL TERM

1. During Elongation RNA polymerase synthesized a short stretch of RNA contain ____Bases

a) 10 bases b) 8 bases c) 6 bases d) 6 to 10 bases

2. During elongation the enzyme performs tasks beside RNA synthesis are.

a) Unwinds DNA b) Dissociates RNA from Template

c) Proof Reading d) All of these

3. The 3rd step of Transcription is

a) Elongation b) Termination c) Elongation and termination d) Initiation

4. in some cells specific , well characterized sequences trigger termination in others its is_____what instructs the enzyme

a) More Clear b) Less clear c) Not clear d) unpredicted

5 once the newly RNA is created during transcription which factor is reassessed as well

a) Alpha factor b) beta factor c) gama factor d) sigma factor

6. RNA polymerase initiates transcription in bacteria from

a) Specific point b) middle of the DNA c) start of the DNA d) Any point of DNA

7. Which factor recognize that from which point the transcription have to start

a) Alpha b) Beta c)Sigma d) Omega

8. Bacterial Core enzyme is consist of

a) Alpha 2 Beta Beta Prime Omega b) Sigma alpha2 Beta Beta Prime Omega

c) Alpha2 Beta Beta Prime Sigma d) Alpha2 Beta Omega

9. in the case of E. coli the predominant Sigma factor is called

a) Sigma 50 b) Sigma 60 c) sigma 70 d) Sigma80

10. Promoters recognized by polymerase have ____conserved sequence each of ____ nucleotides.

a) 2 – 6 b) 2 – 7 c) 3 -6 d) 3- 7

11. the defined sequences are centered respectively at ____ and ____ upstream of the site where RNA synthesis starts

a) 10 bp and 35 bp b) 10bp and 30bp c) 17bp and 19 bp d) 17bp and 35bp

12. the sigma 70 factor can be divided into _____ regions during transcription in bacteria

a) one b) two c) three d) four

13. Which sigma70 factors regions recognize the -10 and -35 elements of the promoters?

a) 1 and 4 b) 2 and 4 c) 1 and 3 d) 2 and 3

14. Two helices within region 4 of Sigma factors form DNA binding Motif called a

a) Helix-turn-Helix b) Alpha-turn-Helix b) Helix-Alpha-Turn c) Helix-Helix-Turn

15. Two helicess in region 4 one helices inserts into the _____and interacts with bases in the -35 region

a) Minor Groove b) Major Groove c) Minor and Major Groove d) none

16. in which region the DNA starts separating during transcription

a) -10 region b) -35 region c) both -10 and -35 d) -30

17. The a Helix involved in the recognition of the -10 region contains several essential _____amino acids that can interact with bases.

a) Aliphatic b) Aromatic c) Acidic d) Basic

18. Transition to the open complex involves_____ in RNA polymerase and in the Promoter DNA

A) Chemical changes b) Physical changes c) structural changes d) All of these

19. Melting occurs between positions __ and ___ with respect the transcriptions start site

a) -11 and +2 b) +11 and -2 c) -10 and +2 c) +2 and -11

20. in case of the bacterial enzyme bearing sigma70 this transition is often called____

a) Ionization b) Decomposition c) Transcription d) Isomerization

21. The energy required for RNA polymerase in Bacteria derived from

a) ATP hydrolysis b) Conformation Changes c) No requirement of energy d) A&B

22. Isomerization in transition of open complex is a

a) Reversible b) Irreversible c) associated d) none of these

23. Formation of closed complex in contrast is readily _____

a) Reversible b) Irreversible c) associated d) All of these

24. There are _____ channels into the open complex

a) 3 b) 4 c) 5 d) 6

25. The _____uptake channel allows ribonucleotides to enter the active center

a) (Non Template)NTP channel b) RNA- Exit c) 2 pincers d) All of these

26. Within the active center cleft , the DNA strands separate from position

a) +5 b) +3 c) -11 d) +7

27. In the open complex region 1.1 shifts _____ position allows to DNA to access

a) 40 A b) 30 A c) 50 A d) 70A

28. Region 1.1 of sigma is highly _____charged thus in the holoenzyme region 1.1 acts as molecular mimic of DNA

a) Positively charged b) negatively charged c) neutral d) Highly Negatively charged

29. The space in the active center cleft occupied by region 1.1 or DNA is highly ____

a) Positively charged b) negatively charged c) neutral d) highly positive charged

30. RNA polymerase can initiate a new RNA chain on a DNA template and thus does not need a ____

a) Template b) Primer c) Active site d) All of these

31 RNA polymerase start most transcripts with

a) Adenine c) Cytosine c) guanine d) thymine

32. during initial transcription , RNA polymerase produces and releases short RNA transcripts of <10 nucleotides called

a) complete synthesis b) abortive synthesis c) incomplete synthesis d) All of these

33. The _____ model proposes forward and reverse translocation of RNA polymerase

a) Transient excursion b) inchworming c) scrunching d) None of these

34. The experiments have shown that during transcripitoin the polymerase remains_____ on the promoter.

a) Stationery b) not stationary c) move along with promoter d) All of these

35. Which of the following is not the function of elongating polymerase

a) Synthesis RNA b) Proof Read RNA c) Synthesis DNA

36. Double stranded DNA enters the front of the enzyme between the ____

a)catalytic cleft b) pincers c) active site d) All of these

37. During elongations the enzyme adds _____nucleotide at a time to the growing RNA transcript.

a) one b) Two c) three d) Four

38. The size of the bubble length of DNA that is not double helical remains_____ throughout the elongation

a) Variable b) Non variable c) Constant d) none of these

39. RNA polymerase performs _____ proofreading functions on the growing transcript

a) one b) two c) three d) four

40. The sequences called_____ trigger the elongating polymerase to dissociate from the DNA and release the RNA chain it has made

a) Primer b) Promoter c) Terminators d) Template

41. There are ____ Types of terminators in bacteria

a) one b) Two c) Three d) Four

42. Rho-dependent terminators have rather ill-defined RNA elements called

a) Tuff sites b) ill sites c) Rut sites d) All of these

43. Rho binds the single stranded RNA as it _____the polymerase

a) Enter b) Exit c) inside the polymerase d) in the cleft

44. The collision pushes polymerase forward causing dissociation of ternary complex of

a) RNA polymerase b) Template DNA c) RNA transcript d) All of these

45. Rho independent terminators sequence elements contain repeat of _____ nucleotides followed by the stretch of about eight ____base pairs

a) 20 and A:T b) 18 and A:T c) 20 and G:C d) 18 and G:C

46. The hairpin works as an efficient terminator only when it s followed by a stretch of ___base pair

a) A:T b) A:U c) G:U d) C:U

Topics 111 to 120

Rho Dependent
Rho independent

47. Bacteria have only _____RNA polymerase but eukaryotes have _____ RNA polymerase

a) one and three b) one and five c) one and four d) one and one

48. RNA Polymerase IV and V are present in....

a) Prokaryotes b) Eukaryotes c) Plants d) All of these

49. In Vitro, the general transcription factors are all that required together with ____ to initiate transcription on a DNA template

a) RNA Pol-II b) RNA Pol-III c) RNA Pol-Iv d) RNA Pol-V

50. In vivo, GTF are not alone sufficient to bind promoter sequence so the additional factors required are..

a) Mediator complex b) chromatin modifying enzymes c) DNA template d) A&B

51. The eukaryotic core promoter refers the minimal set of sequence elements required for accurate transcription initiation by the _____ machinery

a) Pol I b) Pol II c) Poll III d) All of these

52. A core promoter is typically _____ nucleotides long, extending either _____ from the transcription start site.

a) ~40 to ~60 and Upstream b) ~40 to ~60 and downstream

c) ~40 to ~60 and upstream or downstream d) ~40 to ~50 and downstream

53. The Elements found in Pol II core promoter include the...

a) TFIIB b) BRE c) TATA Box d) Inr and DPE e) All of these

54. TATA box containing promoter also contains a ____

a) DCE b) DPE c) BRE d) All of these

55. the most common element found in combination with both TATA and DPEs

a) DCE b) Inr c) DPE d) BRE

56. Many Pol II promoters contain TATA element some _____upstream of the transcription start site.

a) 20 Bp b) 30 Bp c) 40Bp d) 50Bp

57. The TATA element recognized by the general transcription factor called

a) TFIID b) TFIIID c) TFIVD d) TFVD

58. The component of TFIID that binds to the TATA DNA sequence is called___

a) DPE b) TBP c) BRE d) All of these

59. During the abortive initiation the polymerase synthesizes a series of _____ transcripts

a) short b) Long c) Very long d) wide

60. In eukaryotes promoter escape involves _____ steps.

a) one b) Two c) Three d) Four

61. The large subunit of Pol II has a corbyx-Terminal Domain (CTD) which is referred as3

a) Head b) Tail c) Midpoint d) start Point

62. The CTD contains a series of repeats of the _____ sequence

a) Octapeptide b) Pentapeptide c) heptapeptide d) Decapeptide

63. Series of repeats of the heptapeptide sequence in yeast Pol II CTD are

a) 25 b) 27 c) 29 d)37

64. Series of repeats of the heptapeptide sequence in worm Pol II CTD are

a) 37 b) 25 c) 32 d) 35

65. Series of repeats of the heptapeptide sequence in human Pol II CTD are

a) 36 b) 46 c) 52 d) 53

66. Series of repeats of the heptapeptide sequence the number of repeats correlate with the complexity of the ____

a) Genes b) Genetic Makeup c) Genome d) none of these

67. Heptapeptide sequence repeat contains sites for phosphorylation by specific enzyme called

a) RNA pol II b) RNAase c) Kinase d) All of these

68. Regulating the _____state of the CTD of Pol II controls subsequent steps elongation and processing of RNA

a) Methylation b) Acetalytion c) Phosphorylation d) All of these

69. Enzyme the remove phosphate group from CTD Is called

a) RNA Polymerase b) Kinase c) Phosphatase d) None of these

70. General Transcription Factors are complexes made up of

a) Two sub units b) three sub units c) two or more subunits d) none of these

71. TBP is associated with about _____ TAFs _____ of the TAFs bind DNA elements at the promoter.

a) 10 – 2 b) 8 – 2 c) 2 – 10 d) 2 – 8

72. Several of the TAFs have structural homology with _____proteins

a) Adenine b) Histone c) Cytosine d) All of these

73. TAF42 and TAF62 from Drosophila have been shown to form a structure similar to that of the _____tetramer of Histones

a) H2.H3 b) H3.H4 c) H1.H2 d) All of these

74. Structural studies suggest that segments of TFIIB insert into the RNA-exit channel and active center cleft of Pol II in a manner analogous to the σ region_____linker in the bacterial case.

a) 3/4 b) 3/3 c) 1/2 d) 4/3

75. _____controls the ATP-dependent transition of the preinitiation complex to the open complex.

a) TFIIE b) TFIIA c) TFIIH d) TFIIF

76. Within TFIIH are two subunits that function as ____and another that is a protein ____, with roles in promoter melting and escape

a) ATPases and Kinase b) ADPase and Phosphatase

a) ATPase and Phosphatase c) Kinase and Phosphatase

77. It is now believed that a subunit of TFIIH acts as an ATP-driven translocator of _____

A) double –stranded RNA b) Double – Stranded DNA

c) Single – Stranded DNA d) Single – Stranded RNA

78. TFIIH subunit binds to DNA downstream from polymerase and feeds double-stranded DNA, with a _____threading, into the cleft of the polymerase.

a) right-handed b) left – Handed c) Right and Left handed both d) None

79. Transcriptional regulatory proteins called _____ help recruit polymerase to the promoter, stabilizing its binding there

a) inhabitor b) Activator c) Preactivator d) Stoper

80. The yeast and human Mediators each include more than _____subunits of which ___ show significant sequence homology between the two organisms

a) 20 – 7 b) 7 – 20 c) 10 – 20 d) 20 – 10

81. The mediator from both yeast and humans are organized in_____

a) Packets b) Templates c) Modules d) All of these

82. Modules called head, middle and tail can be dissociated from one another under certain condition in

a) In vivo b) in vitro c) both A & B d) None of these

83. Crystal structure of the head module of yeast mediator reveals that it contains _____ subunits

a) 5 b) 6 c)7 d) 8

84. 3 domain structure that binds the Transcription complex in such a way as juxtapose TFIIH and the CTD tail of RNA polymerase promoting _____ of the latter by the former

a) Phosphorylation b) ATP Hydrolysis c) Methylation d) All of these

85. Once polymerase has escaped the promoter and initiated transcription, it shifts into the

a) Initiation phase b) elongation phase c) termination phase d) All of these

86. Which of the following factors are the Elongation Factors?

a) TFIIS b) SPT5 c) TFIIH d) A&B

87. Which factors are recruited during elongation phase?

a) Capping enzyme b) splicing machinery c) polyadenylatoin and cleavage d) All of these

88. CTD tail could potentially extended _____ from the body of the enzyme that is about _____ times the length of the rest of the enzyme

a) 800A – 7 b) 700A – 8 c) 600A – 7 d) 500A – 7

89. Which protein bound to Pol II that phosphorylates the serine residue at position 2 for the CTD REPEATS?

a) Phosphatase b) Kinase c) Kinase P-TEFb d) RNAase

90. In addition , P-TEFb phosphorylates and thereby activates another protein called

a) SPT5 b) TAT_SF1 c) TFIIS d) All of these

91. P-TEFb stimulates elongation in _____ separate ways

a) one b) two c) three d) four

92. NusG/SPT5 factors bind to their respective RNA polymerase at the _____ of the clamp

a) Top b) Bottom c) Tip d) Middle

93. The first human _____ protein was originally identified as the product of a gene that undergoes translocation in acute myeloid leukemia

a) ELL b) SPT5 c) TFIIS d) NusG

94. Which factor that contributes to proofreading by polymerase

a) ELL b) SPT5 c) TFIIS d) NusG

95. TFIIS stimulates an inherent Rnase activity in polymerase allowing an alternative approach to removing misincorporated bases through local

a) Limited RNA degradation b) Unlimited RNA degradation

a) Short limited RNA degradation d) All of these

96. The final RNA processing event, _____ of the 3' end of the mRNA is intimately linked with the termination of transcription

a) Phosphorylation b) polyadenylation c) Adenylation d) Ionization

97. If the end of the RNA is uncapped it is called

a) Genuine transcript b) Not genuine transcript c) partial genuine d) None of these

98. The highly processing RNase polymerase either pushes polymerase _____ the remains of the nascent RNA transcript from the enzyme.

a) Forward b) Pulls c) Forward or pulls d) none of these

99. Which factor is universally involved in initiating transcription by Pol I , Pol II and Pol III

a) TBP b) SPT5 c) ELL d) TFIIS

100. _____is required for teh expression of only one gene that encoding the rRNA precursor

a) Pol I b) Pol II c) Pol III d) All of these

101. The promoter for the rRNA gene comprises two parts _____and_____

a) Coat element and UCE
b) Core element and UCE
c) Core element and TBP
d) Core and ELL

Topics 121 to 130

102. The former is located around the start site of transcription, and the latter between ___ upstream (in humans).

a) Active site - 100 and 150bp
b) start site – 100 and 150bp
c) start site - 120 and 150 bp
d) active site – 120 and 150 bp

103. In addition to Pol I, initiation requires two other factors, called _____

a) SFII b) UCE c) SL1 and UBF d) SL1 and TBP

104. SL1 comprises _____ specific for Pol I transcription

a) TBP and 3 TAFs b) UBF and 2 TAFs c) ELL and 2 TAFs d) TBP and 2 TAFs

105. SL1 binds DNA only in the presence of UBF.

a) ELL b) UBF c) TBP d) UCE

106. Pol III promoters come in various forms, and the vast majority have the unusual feature of being located _____ from the transcription start site

a) Upstream
b) downstream
c) up and downstream
d) in btw up and downstream

107. Some Pol III promoters (e.g., those for the tRNA genes) consist of two regions, called ___ separated by a short element.

a) Box A b) Box B c) Box A and Box B d) Box C

108. 5S rRNA gene contains box

a) Box A b) Box B c) Box C d) Box A and box C

109. The TFIIIC complex binds to the promoter region. This complex recruits TFIIIB to the DNA just _____ of the start site, where it, in turn, recruits Pol III to the start site of transcription.

a) Upstream b) Downstream c) A and B d) in btw up and Downstream

110. The coding sequence of a gene is a series of _____ codons that specifies the linear sequence of amino acids in its polypeptide product

a) 3 Nucleotides b) 4 nucleotides c) 5 nucleotides d) variable nucleotides

111. It is generally assumed that the coding sequence is _____ i,e., the codon for one amino acid is immediately adjacent to the codon for the next amino acid in the polypeptide chain

a) Discontinuous b) Contiguous c) variable d) All of these

112. In eukaryotic genes the coding sequence is interrupted by stretches of _____

a) Coding sequence b) non coding sequence

c) Contiguous coding sequence d) discontinues coding sequence

113. The coding sequences are called____ and the intervening sequences are called ___

a) Exons and introns b) Introns and Exons c) Intron and Codon d) Exons and Codon

114. Once transcribed into an RNA transcript, the _____ must be removed and the ____ joined together to create the mRNA for that gene.

a) Exons and introns b) Introns and Exons c) Intron and Codon d) Exons and Codon

115. The no of the introns in the case of the Titin gene of humans are.

a) 360 b) 361 c)362 d) 363

116. Introns are very often much____ than the exons they separate

a) Shorter b) longer c) very short d) very long

117. exons are typically on the order of _____nucleotides, whereas introns—although they too can be short—can be as long as _____nucleotides

a) 150 and 800KB b) 150 and 700Kb c) 100 and 800kb d) none of

118. Example of mammalian gene Enzyme is

a) dihydrofolate b) reductase c) dihydrofolate reductase d) Non of

119. The split genes of eukaryotes are transcribed into a _____ of the entire gene

a) Single RNA copy b) Double RNA copy c) Tripple RNA copy d) All of these

120. The length and number of introns, the primary transcript (or pre-mRNA) can be ___

a) Long b) Very long c) Short d) very short

121. primary transcripts of intron-containing genes must have their introns ____ before they can be translated into proteins.

a) Added b) Removed c) stopped d) no effect

122. RNA Splicing must occur with great precision to avoid the ____of even a single nucleotide at the sites at which the exons are joined.

a) Loss b) Addition c) loss or addition d) removal

123. Lack of precision in splicing will change the reading frames of ____

a) Introns b) exons c) introns and exons d) codons

124. Alternative splicing strategy enables a gene to give rise to more than one polypeptide product. These alternative products are called

a) Isomers b) Intromers c) Isoforms d) exons

125. It is estimated that 90% or more of the protein-coding genes in the human genome are spliced in alternative ways to generate more than one isoform

a) 90% b) 80% c) 70% d) 90% or more

126. The borders between introns and exons are marked by specific nucleotide sequences within_____

a) pre-mRNAs. B) Mature mRNA c) post-mRNA d) All of these

127. The 5' and 3' splice sites were sometimes referred to as the _____ sites, respectively

a) Acceptor and donor b) Donor and accepter

c) Receptor and donor d) Donor and receptor

128. The third sequence necessary for splicing. This is called the _____site

a) Active b) branchpoint c) Acceptor d) Donor

129. The most highly conserved sequences are the ___ in the 5' splice site, the___ in the 3' splice site, and the A at the branch site.

a) GU and AG b) AG and GU c) AT and GC d) GC and AT

130. An intron is removed through two successive transesterification reactions in which _____within the pre-mRNA are broken and new ones are formed

a) ester linkage b) phosphodiester linkages c) Ether linkage d) Peptide linkage

131. The first reaction is triggered by the 2'-OH of the conserved A at the branch site. This group acts as _____ato attack the phosphoryl group of the conserved G in the 5' splice site

a) nucleophile b) Acetophile c) Acidic d) Basic

132. In this first reaction, the phosphodiester bond between the ____ and ____ at the 5' junction between the intron and the exon is cleaved.

a) Amino and Sugar b) Sugar and Phosphate c) Amino and Phosphate d) All of these

133. in addition to the 5' and 3' backbone linkages, a third phosphodiester extends from the 2'-OH of that A to create a three-way junction hence its description as a ____

a) Active point b) Active site c) Branchpoint d) at any point

134. In the second reaction, the 5' exon reverses its role and becomes a nucleophile that attacks the _____at the 3' splice site.

a) phosphoryl group b) Ester group c) Phosphodiester group d) none of these

135. the 5' end of the intron had been joined to branchpoint A in the first transesterification reaction, the newly liberated intron has the shape of a _____

a) Oval b) linear c) Lariat d) Octagon

136. In the two reaction steps, there is no net gain in the number of chemical bonds_____phosphodiester bonds are broken, and ____ new ones are made

a) 2 and 2 b) 2 and 3 c) 3 and 3 d) 2 and 4

137. During the removal of introns two phosphodiester bonds are broken, and two new ones are made

a) ATP required b) No energy required c) no change d) none of these

138. during the splicing reaction

a) Less energy required b) no energy required

c) large amount of energy required d) no change in energy

139. Point regarding the splicing reaction is direction: what ensures that splicing only goes forward—that is, toward the products

a) Forward b) Backward c) A & B d) forward toward the product

140. The transesterification reactions are mediated by a huge molecular "machine" called ___

a) Nucleosome b) cytosome c) spliceosome d) All of these

141. The spliceosome machine size is similar to a

a) Lysosomes b) Neucloesome c) Ribosomes d) nucleus

142. The Spliceosome complex machine comprises about____ proteins and _____RNAs

a) 150 and 5 b) 130 and 5 c) 145 and 7 d) 145 and 5

143. In performing even a single splicing reaction, the spliceosome hydrolyzes ____

a) 10 ATP Molecules b) 30 ATP molecules c) 50 ATP molecules d) Several ATP Molecules

144. Many of the functions of the spliceosome are performed by

a) RNA component b) Protein component c) A & B d) None of these

145. _____ locate the sequence elements at the intron – exon borders and likely participate in catalysis of the splicing reaction itself.

a) RNA b) Protein c) RNA and Protein d) none of these

146. The five RNAs (U1, U2, U4, U5, and U6) are collectively called

a) siRNA b) snRNA c) sniRNAs. d) mRNA

147. snRNAs is between ____and____ nucleotides long in most eukaryotes and is complexed with several proteins

a) 100 and 300 b) 200 and 300 c) 150 and 300 d) 200 and 250

148. snRNPs is stand for ... no option

Small nuclear Ribonuclear Proteins

149. The snRNPs have _____ roles in splicing

a) one b) two c) three d) four

150. During the splicesome which interactions are important?

a) RNA – RNA b) RNA – Protein c) Protein – Protein d) All of these

151. Some non-snRNPs are also involved in splicing. One example, ____recognizes the polypyrimidine (Py) tract/3' splice site

a) U2AF b) U3AF c) U4AF d) U5AF

152. Proteins involved in the splicing reaction include

a) RNA-annealing factors b) DEAD-box helicase proteins c) Primase d) A & B

153. Which enzyme helps load snRNPs onto the mRNA

a) RNA Annealing Factor b) Dead Box Helicase c) Primase d) All of these

154. The latter use their ___ activity to dissociate given RNA -RNA interactions, allowing alternative pairs to form and thereby driving the rearrangements that occur through the splicing reaction

a) Primase b) Helicase c) ATPase d) phosphatase

155. U4 is released from the complex, allowing U6 to interact with U2 through the ___ base pairing

a) RNA – RNA b) RNA – Protein c) Protein – Protein d) none of these

156. The second reaction, between the 5' and 3' splice sites, is aided by the U5 snRNP, which helps to bring the__ exons together

a) one b) two c) three d) four

157. classes of splicing found in the cells are

a) Nuclear pre-mRNA b) Group II introns c) Group I introns d) All of these

158. self-splicing introns are

a) Nuclear pre-mRNA b) Group II introns c) Group I introns d) B and C

159. Group I introns splice by a different pathway. Instead of a branchpoint A residue, they use a free G

A) nucleotide b) nucleoside. C) Nucleotide or nucleoside d) Exon

160. This G species is bound by the RNA, and its ____group is presented to the 5' splice site.

a) 3'-OH b) 2' – OH c) 5' – OH d) All of these

161. The structure of group I introns includes a binding pocket that will accommodate any ___ nucleotide or nucleoside

a) Guanine b) Adenine c) cytosine d) uracil

162. __ are essential for splicing. They not only ensure the accuracy and efficiency of constitutive splicing but also regulate alternative splicing

a) ELL Protein b) UDE Protein c) SR Protein d) All of these

1. common form of Allternating splicing in which complete exons are included or excluded from the mature message

a) Cassette exon b) simple exon c) complex exon d) All of these

2. Proteins that regulate splicing bind to specific sites called ____

a) Exonic ESE or intronic ISE b) Silencers (ESS or ISS)

c) A & B d) None of these

ESE – Exonic Splicing Enhancers ISE – Intronic Splicing Enhencers

ESS - Exonic Splicing Silencers ISS – Intronic splicing Silencers

3. Each SR protein has another domain, rich in arginine and serine, called

a) SR domain b) RS domain

c) A and B d) Non of these

4. Larry simpson and colleagues found the that editing system should add or delete UMPs when they discovered

a) gRNAs b) hRNAs c) ssRNAs d) ggRNAs

gRNAs - Guide RNAs

5. kinetoplasts have a terminal ____that could add extra UMPs (uridylates) to the mRNA during editing

a) TUTAase b) TUTase c) TUMPase d) all of these

uridylyl transferase (TUTase)

6. During editing mRNA has to cut and add UMPs so kinetoplasts contain

a) RNAase b) RNA ligase c) RNA protease d) non of these

7. information in nucleotides interpreted to generate sequence of amino acids is called

a) Transcription b) termination c) replication d) translation

1. Many genes in higher eukaryotes encode ____ that can be spliced in alternative ways to generate two or more different ___ and thus different protein products

a) RNAs – mRNAs b) DNAs – mRNAs

c) RNAs – tRNAs d) RNAs – rRNAs

2. what % Drosophila genes undergo alternative splicing

a) 30% b) 40% c) 50% d) 60%

3. What % Human Genes undergo Alternative splicing

a) 70% b) 80% c) 90% d) 95%

4. Many alternatively spliced genes generate only __ alternative products

a) one b) two c) threed) four

5. the number of potential alternatives that can be generated from a single gene is breathtaking -hundreds e.g., in the human ___

a) Slo gene b) XlO gene c) SLE gene d) All of these

6. The mammalian muscle protein is

a) Troponin U b) Troponin T c) Troponin Q d) All of these

7. The pre mRNA made from troponin T gene contains ___

a) 3 exons b) four exons c) five exons d) seven exons

8. The case of T antigen of the monkey virus SV40 shows an example of an

a) Extended exon b) skiped exon c) deleted exon d) retained exon

9. Both forms of T antigens are made in a cell infected by

a) SV50 b) SV40 c) SV30 d) SV55

10. ___ induce transformation and cell cycle re-entry, whereas ___ blocks the apoptotic response of cells forced down that path

a) large T and small t b) small t and large T c) Small t and small t

11. The ratio of the two forms produced differs depending on the level of the splicing regulator

a) SF2/ASF b) SF2/ASF2 c) SF2/AFS2 d) SF3/AFS

12. In __% of cases, cassette exons come in pairs, only one of which is included in the spliced message.

a) 20% b) 30% c) 40% d) 10%

13. Most silencers are recognized by members of the

a) hnRNP family b) hrNP family c) RNP family d) All of these

heterogeneous nuclear ribonucleoprotein (hnRNP) family.

14. In case of *Dscam*, for example, Hrp36 inhibits inclusion of __ variants in the mRNA.

a) Exon 5 b) Exon 6 c) Exon 7 d) Exon 3

15. isoforms have ____functions

a) simmilar b) distinct c) antagonistic d) All of these

16. alternative splicing is used simply as a way of switching expression of the gene as__

a) on b) off c) on and off d) strat and off

17. mechanism of RNA editing is that partially edited transcripts have been isolated, and these are always edited at

a) 3` end b) 5` end c) at any end d) non of these

18. RNA editing prceeds in a direction.....

a) 3' to 5' direction. b) 5` to 3` direction c) in any direction d) non of these

19. RT-PCR stands for ... no options

reverse transcriptase Polymerase Chain reactions

20. Which RNA will provide signals for PCR

a) Edited RNA b) Unedited RNA c) A & Bd) non of these

21. in ___, Scott Seiwert and Stuart used a mitochondrial extract and a gRNA to edit a synthetic pre-mRNA.

a) 1990 b) 1994 c) 1996 d) 1998

22. Scott Seiwert and Stuart observed that deletion of UPM required ___enzymatic activities

a) one b) two c) three d) four

23. During the deletion or insertion of UMPs occurs in the pressense of

a) Nuclease b) TUTase c) Ligase d) All of these

24. deamination of adenosine, which converts adenosine to __

a) Adenoinosine b) inosine c) adnenysine d) non of these

25. deamination of adenosine changes the meaning of a __

a) Template b) Primer c) Codon d) All of these

26. an ACG (threonine) codon becomes an ICG codon, which would be read by the ribosome as

a) GCG b) GCC c) AGG d) GGG

27. Humans and mice contain___ ADAR genes:

a) one b) two c) three d) Four

28. GluR-B protein with a glutamine instead of an arginine is too permeable to

a) Calcium Ions b) Sodium Ions c) Potassium Ions d) All of these

29. who mutated mouse stem cells to heterozygous mutant (ADAR+/-).

a) Kazuko Nishikura and coworkers b) Peter Seeburg and colleagues

c) Kenneth Stuart and colleagues first d) Stuart and coworkers

30. the synthesis of a single protein requires the coordinated action of well over __ proteins and __

a) 200 and mRNAs b) 100 and RNAs c) 100 and tRNAs d) All of these

1 : Eukaryotes lack homologus to.....?

A) MutH B) MutSa C) MutL D) MutLa

2 : Human has three mismatch repair ,these are...?

A) MSH3 ,MSH4 ,MSH5 B) MSH2 , MSH3 , MSH6 C) MSH4 ,MSH5 ,MSH6

3 : MSH2 and MSH6 combine to form a hetrodimer called?

A) MutH B) MutL C) MutSa D) MutSh

4 : Which protein participate in mismatch repair?

A) MSH3 B) MSH6 C) MutH D) MutL

5 : Hetrodimer containing two subunit MLH1 and PMS2 are called?

A) MutLa B) MutH C) MutSa D) None

6 : MutSa ,Exo1 and RPA are adequate to excise a mismatch .when the nick is on ...?

A) 3 side B) 5 side C) Both side D) None

7 : The nick on the 3 side of the mismatch was very puzzling because Exo1 degrades in...?

A) RNA 5 – 3 direction B) RNA 3 – 5 direction C) DNA 5 – 3 direction D) DNA 3 – 5 direction

8 : Genetic information flows from ....?

A) DNA to RNA B) RNA to DNA C) RNA to DNA to Protein D) DNA to RNA to protein

10 : The protein never serve as templates for ...?

A) DNA B) RNA C) mRNA D) rRNA

11 : The central dogma as originally proclaimed more than....?

A) 30 years B) 40 years C) 50 years D) 60 Years

12 : Adinine , Uracil ,Guanine and cytosine should mostly interact with...?

A) Water insoluble groups B) Thymine C) Both a and b D) Water soluble groups

13 : Which RNA carries the information DNA to ribosomal site of protein?

A) mRNA B) rRNA C) tRNA D) snRNA

14 : rRNA component of ribosomes , together with some different ....ribosomal protein?

A) 40 B) 50 C) 60 D) 70

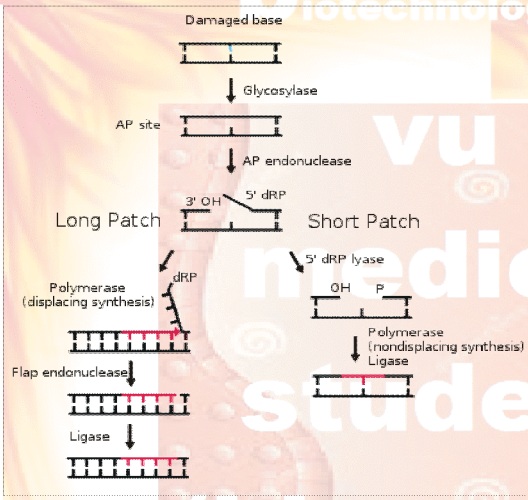
15 : RNA polymerase function only in the presence of....?

A) RNA B) mRNA C) DNA D) rRN

Bio302

1) define base excision repair?

In biochemistry and genetics, **base excision repair** (BER) is a cellular mechanism that repairs damaged DNA throughout the cell cycle. It is responsible primarily for removing small, non-helix-distorting **base** lesions from the genome. The related **nucleotide excision repair** pathway repairs bulky helix-distorting lesions.



2) What are uv types and effects?

The shorter the wavelength, the more harmful the **UV** radiation. However, shorter wavelength **UV** radiation is less able to penetrate the skin. Short-wavelength UVC is the most damaging **type** of **UV** radiation. ... It can penetrate into the deeper layers of the skin and is responsible for the immediate tanning **effect**.

3) What are types of basic amino acids,name any five?

Amino Acids with Hydrophobic Side Chain – Aliphatic

Alanine, Ala, A. Isoleucine, Ile, I. ..
Valine, Val, V.
Phenylalanine, Phe, F. Tryptophan, Trp, W. ...
Asparagine, Asn, N. Cysteine, Cys, C. ...
Threonine, Thr, T.
Aspartic acid, Asp, D. Glutamic acid, Glu, E.
Arginine, Arg, R. Histidine, His, H. ...
Glycine, Gly, G. Proline, Pro, P.

4) what is the effect of 2,4 photoproduct on cell function

5) What is central dogma?

The **central dogma** of molecular biology describes the two-step process, transcription and translation, by which the information in genes flows into proteins: DNA → RNA → protein. Transcription is the synthesis of an RNA copy of a segment of DNA.

6) what is core enzyme of bacteria write three name?

A **core enzyme** consists of the subunits of an **enzyme** that are needed for catalytic activity, as in the **core enzyme** RNA polymerase. An example of a **core enzyme** is a RNA polymerase **enzyme** without the sigma factor (σ).

7) what is base excision repair system write it in detai?

In biochemistry and genetics, **base excision repair** (BER) is a cellular mechanism that **repairs** damaged **DNA**throughout the cell cycle. It is responsible primarily for removing small, non-helix-distorting **base** lesions from the genome. The related **nucleotide excision repair** pathway**repairs** bulky helix-distorting lesions.

In nucleotide **excision repair** (NER), damaged bases are cut out within a string of nucleotides, and replaced with DNA as directed by the undamaged template strand. This **repair** system is used to remove pyrimidine dimers formed by UV radiation as well as nucleotides modified by bulky chemical adducts.

8) what is meant by suffix ase write name of ases.?

The **suffix** -**ase** is used in biochemistry to form names of enzymes. The most common way to name enzymes is to add this **suffix** onto the end of the substrate, e.g. an enzyme that breaks down peroxides may be called peroxidase; the enzyme that produces telomeres is called telomerase.

phosphatase.
catchphrase.
transferase.
plagioclase.
collagenase.
exonuclease.
carboxylase.
dipeptidase.

9) What is BER enzyme write function of three BER enzyme.

In biochemistry and genetics, **base excision repair** (**BER**) is a cellular mechanism that repairs damaged DNA throughout the cell cycle. It is responsible primarily for removing small, non-helix-distorting base lesions from the genome. The related nucleotide excision repair pathway repairs bulky helix-distorting lesions. AP endonucleases End processing enzymes DNA polymerases Flap endonuclease DNA ligase

10)What is Replication fork?

Replication Fork. During DNA * **replication** a DNA double helix must unwind and separate so that DNA polymerase enzymes can use each single strand as a template for the synthesis of a new double strand. Strand separation is catalyzed by a Helicase *enzyme.

11) Methylation of N-3 in adenine and its how it important for treatment of cancer?

12) Write any three function of any enzyme.?

An **enzyme** is **a** protein molecule that is **a** biological catalyst with **three**characteristics. First, **the** basic **function** of an **enzyme** is to increase **the** rate of **a**reaction. Most cellular reactions occur about **a** million times faster than they would in**the** absence of an **enzyme**.

13) Define S & R form of bacteria colonies?

A **bacterial colony** is formed by a single **bacterial** cell that divides by binary fission to **form** thousands of clones. ... R **colonies** are formed by **bacteria** that are usually avirulent. The ability to show variations in both smooth-rough (**S-R**) ways and from rough to smooth (R-S) **colonies** has also been observed in **bacteria**

14) Define Cpd?

CPD stands for **Continuing Professional Development**. It refers to the process of tracking and documenting the skills, knowledge and experience that you gain both formally and informally as you work, beyond any initial training. It's a record of what you experience, learn and then apply.

15) What are Characteristics of genetic material?

It must be stable. It must be capable of being expressed when needed. It must be capable of accurate replication. It must be transmitted from parent to progeny without change. **Sex**-Linked **Recessive Traits**. **Sex chromosomes** define the physiological **gender**of humans. Women have two X chromosomes, and men have an X and a **Y chromosome**. Some **phenotypic characteristics**, or **traits**, are due to genes that are only located on the X or the **Y chromosome** -- they are called **sex**-linked **traits**.

16) Write the structure of influenza virus.

Structurally, the influenza virus is **spherical** in shape. It is covered in an envelope made of a lipid bilayer with spikes of glycoproteins called haemagglutinin and neuraminidase. These proteins enable the virus to effectively bind with a host cell.

17) what is decantation?

Decantation is a process to separate mixtures by removing a liquid layer that is free of a precipitate. The purpose may be to obtain a decant (liquid free from particulates) or to recover the precipitate.

18)What are types of cross linkages of alkylating agent?

Nitrogen mustards. Cyclophosphamide — the most widely used alkylating agent of modern times. Chlormethine also known as mechlorethamine or mustine (HN2) — the first alkylating agent to receive regulatory approval. ... Nitrosoureas. Carmustine. Lomustine. .. Alkyl sulfonates. Busulfan

19)What are **three important discoveries in genetics?**

1. **Rules of Heredity (1850s)**
2. **Genes Are Located on Chromosomes (1910 – 1920s)**
3. **Genes Control Biochemical Events (1930)**
4. **DNA Is the Genetic Material (1928, 1944, 1952)**

20)What are Franklin and Wilkin contributions?

Concept 19 The DNA molecule is shaped like a twisted ladder.**James Watson** and Francis Crick solved the structure of DNA. Other scientists, like **Rosalind Franklin** and Maurice Wilkins, also contributed to this discovery.

21)how psoralen activate?

Psoralens can also be ***activated*** by irradiation with long wavelength UV light. While UVA range light is the clinical standard,

22)How many diferent types of UV radiation effect on the earth and the life?

The most common form of UV radiation is sunlight, which produces **three** main types of UV rays: UVA. UVB.UVC.

These **effects** include mainly sunburn (or erythema) and tanning (or pigment darkening). The chronic **effects of UV** exposure can be much more serious, even life threatening, and include premature aging of the skin, suppression of the immune system, damage to the eyes, and skin cancer.

This means that more **ultraviolet radiation** can pass through the atmosphere to the**Earth's surface**, particularly at the poles and nearby regions during certain times of the year. Without the layer of ozone in the stratosphere to protect us from excessive amounts of **UV**-B **radiation**, life as we know it would not exist.

23)What is telomerase, berief its functions?

the enzyme in a eukaryote that repairs the telomeres of the chromosomes so that they do not become progressively shorter during successive rounds of chromosome replication.

Telomerase: **structure**, functions, and activity regulation. Telomerase is the enzyme responsible for maintenance of the length of telomeres by addition of guanine-rich repetitive sequences. Telomerase activity is exhibited in gametes and **stem** and tumor cells.

24)Write 3 Developments in the field of Genetics

25)Eslist any 3 way in which PAHs are formed?

Polycyclic aromatic hydrocarbons are primarily found in natural sources such as creosote. They can result from the incomplete combustion of organic

matter. **PAHs** can also be produced geologically when organic sediments are chemically transformed into fossil fuels such as oil and coal.

26)How many Local conformational secondary proteins join to form a protein molecule?

Within the long **protein** chains **there** are regions in which the chains are organised into regular **structures** known as alpha-helices (alpha-helixes) and beta-pleated sheets. These are the **secondary structures** in **proteins**. These **secondary structures** are held together by hydrogen **bonds**.

The term secondary structure refers to the interaction of the **hydrogen bond donor**and acceptor **residues** of the repeating peptide unit. The two most important secondary structures of proteins, the **alpha helix** and the beta sheet, were predicted by the American chemist Linus Pauling in the early 1950s.

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