

18. **How can DNA be stored?**

At room temperature for a few months or for 1 year under refrigeration. For longer storage, it should be frozen at -20°C to -70°C. DNA can be damaged by repeated freeze/thaw cycles. Frost-free refrigerators should be avoided for that reason.

19. **At what temperature should RNA be stored?**

-20°C for a few months or -70°C for longer storage.

20. **Which is more stable—extracted DNA or RNA?**

DNA.

21. **Which is more susceptible to contamination-- extracted DNA or RNA?**

RNA. It is easily destroyed by RNase enzymes that are ubiquitous in the environment

22. **What can be used to prevent RNA contamination in the molecular laboratory?**

An RNase decontamination solution to clean gloves, benchtops, and equipment; and use of RNase-free disposables and nuclease-free water.

23. **What factors can affect the yield of DNA?**

The patient's WBC, how the sample was stored and processed, and laboratory technique.

24. **How is the yield of nucleic acid extracts assessed?**

A spectrophotometric method can be used to measure absorbance of the extract at 260 nm, a wavelength of light that is absorbed by nucleic acids. To determine  $\mu\text{g/mL}$  of dsDNA, the absorbance at 260 nm is multiplied by 50. To determine  $\mu\text{g/mL}$  of RNA, the absorbance at 260 nm is multiplied by 40. Gel electrophoresis and densitometry can also be used to determine yield.

25. **How much DNA is in 100  $\mu\text{L}$  of a sample with an  $A_{260}$  of 0.35?**

1.75  $\mu\text{g}$ . ( $0.35 \times 50 = 17.5 \mu\text{g/mL}$ , so there would be 1.75  $\mu\text{g}$  in 100  $\mu\text{L}$ .)

26. **What is  $A_{260}/A_{280}$  ratio?**

A method to determine purity of extracted DNA or RNA. Absorbance is read at 260 nm, a wavelength of light that is absorbed by nucleic acids, and at 280 nm, an absorption peak for protein.

27. **What is the purity of a sample that has an  $A_{260}$  of 0.35 and an  $A_{280}$  of 0.20?**

1.75. ( $0.35/0.20 = 1.75$ )

28. **What  $A_{260}/A_{280}$  ratio is indicative of high purity DNA?**

1.8.

29. **What  $A_{260}/A_{280}$  ratio is indicative of high purity RNA?**

2.0.

30. **What does a DNA  $A_{260}/A_{280}$  ratio less than 1.6 indicate?**

Protein contamination. The specimen must be reprocessed.