DNA Extraction

Glucose and salt are : added to increase the osmotic pressure outside the cells.

Tris is a buffering agent used to maintain a constant pH (= 8.0).

EDTA protects the DNA from degradative enzymes (called DNAses); EDTA binds divalent cations that are necessary for DNAse activity.

NaOH and SDS (a detergent) : The alkaline mixtures ruptures the cells, and the SDS detergent breaks apart the lipid membrane and solubilizes cellular proteins. NaOH also denatures the DNA into single strands.

The acetic acid neutralizes the pH, allowing the DNA strands to renature.

The potassium acetate also precipitates the SDS from solution, along with the cellular debris.

Isopropanol effectively precipitates nucleic acids, but is much less effective with proteins. A quick precipitation can therefore purify DNA from protein contaminants. It also make the DNA form in the fiber form.

Ethanol helps to remove the remaining salts and SDS from the preparation.> it precipitate the DNA .

Protinase K digest the proteins.

Phenol: $CHCl_3$ extract DNA.

The solid support e.g. (silica , pharmaceia ,clonetech ,Qiagen) : binding DNA and then the elute will be with low salt buffer

TE buffer: consist of tris and EDTA it is used to elute DNA and to keep and store the DNA in order to use it in other experiments.

RNA Extraction

Guanidinium thiocyanate : is used to lyse cells and virus particles in RNA and DNA extractions, where its function, in addition to its lysing action, is to prevent activity of RNase enzymes and DNase enzymes by denaturing them. These enzymes would otherwise damage the extract.

b-mercaptoethanol solution : is used to reduce disulfide bonds and can act as a biological antioxidant.

salt and ethanol Precipitate RNA.

High concentration salt solution : Proteins/DNA are precipitation .

SDS : Cell membranes are lysing and proteins denaturing .