MEMUDUAGAN FRANCES

 17/MHS02/054

 BCH204

ASSIGNMENT

1.StepsofDNAreplication TherearethreemainstepstoDNAreplication:initiation,elongation,andtermination.

Inordertofitwithinacel’snucleus,DNAispackedintotightlycoiledstructurescaled chromatin,whichloosenspriortoreplication,alowingthecelreplicationmachinerytoaccess theDNAstrands.

BeforeDNAreplicationcanbegin,thedoublehelixstructureoftheDNAmoleculeshastobe ‘unzipped.’Helicase,anenzyme,isintegraltothisprocess,breakingthehydrogenbondsthat holdthecomplementarybasesofDNAtogether(AwithTandCwithG).Theseparationcreates a‘Y’shapecaledareplicationforkandthetwosinglestrandsofDNAnowactastemplatesfor makingnewstrandsofDNA.

Next,theSingle-StrandedDNABindingProtein(SSBProtein)bindstothenowsingle-stranded DNA,preventingtheseparatingstrandsfrom joiningagain.

Thetwostrandsofthedouble-helixDNAarejoinedtogetherbycross-bars,twistedaround.For thistowork,eachDNAstrandrunsinoppositedirection.

Oneofthestrandsisorientedinthe3’to5’direction(towardsthereplicationfork),thisisthe leadingstrand.Theotherstrandisorientedinthe5’to3’direction(awayfrom thereplication fork),thisisthelaggingstrand.

2.OUTLINETHEFUNCTIONSOFDNAREPLICATIONENZYMES

Enzyme- - Function

Topoisomerase - Relaxesthesuper-coiledDNA

DNAhelicase. - Unwindsthedoublehelixatthereplicationfork

Primase - ProvidesthestartingpointforDNApolymerasetobeginsynthesisofthe newstrand

DNApolymerase - SynthesizesthenewDNAstrand;alsoproofreadsandcorectssome erors

DNAligase. - Re-joinsthetwoDNAstrandsintoadoublehelixandjoinsOkazaki fragmentsofthelaggingstrand