ϕX174

GenBank Accession #: NC_01422
See page 169 for ordering information.

There are no restriction sites for the following enzymes: AarI(x), Acc65I, AcuI, AfeI, AgeI, AlwI, AlwNI, ApaI, AscI, AsiSI, AvrII, BamHI, BanII, BclI, BglI, BglII, BlpI, BmgBI, BmrI, BmtI, BsaI, BsaXI, BsgI, BsmBI, BspDI, BspEI, BsrFI, BsrGI, BstBI, BstEII, BstYI, BstZ17I, Bsu36I, ClaI, DpnI, DpnII, EagI, EcoNI, EcoO109I, EcoRI, EcoRV, FauI, FseI, FspAI(x), HindIII, I-CeuI, I-SceI, KpnI, MboI, MscI, NaeI, NcoI, NdeI, NgoMIV, NheI, NotI, NsiI, NspI, PI-PspI, PI-SceI, PacI, PciI, PflFI, PmeI, PmlI, PpuMI, PspOMI, PspXI, PvuI, PvuII, RsrII, SacI, SalI, SanDI(x), Sau3AI, SbfI, ScaI, SfiI, SgrAI, SmaI, SnaBI, SpeI, SphI, SrfI(x), StyI, SwaI, TatI(x), TspMI, Tth111I, XbaI, XcmI, XmaI

(x) = enzyme not available from NEB

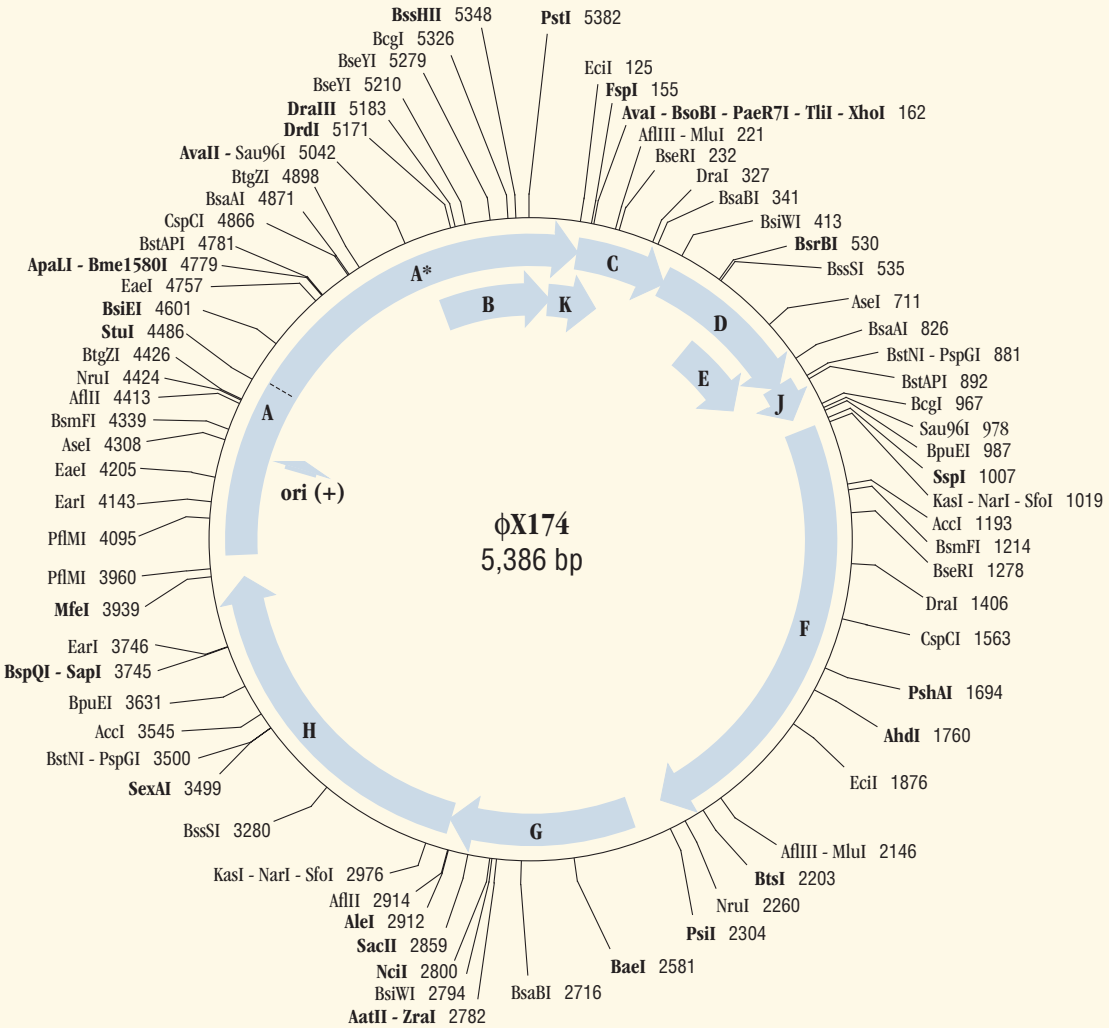
ϕX174 is a small *E. coli* bacteriophage with a circular, single-stranded DNA genome coding for 11 proteins (1,2). Double-stranded forms of the molecule (RF I and RF II) arise during DNA replication. The DNA strand in the virion, termed the plus strand, is shown below. Nucleotide numbering begins at the last G in the unique PstI site (...CTGCAG...).

Enzymes with unique restriction sites are shown in **bold** type and enzymes with two restriction sites are shown in regular type. Location of sites of all NEB restriction enzymes can be found on the NEB web site (choose Technical Reference > DNA Sequences and Maps). Restriction site coordinates refer to the position of the 5´-most base on the top strand in each recognition sequence.

Open reading frame (ORF) coordinates are in the form "translational start – translational stop"; numbers refer to positions on the top (clockwise) strand, regardless of the direction of transcription and include the start and stop codons.

Feature	Description	Coordinates
ori	origin of plus strand replication	4306
gene A	RF replication	3981-136 (cw)
gene A*	shut off host DNA synthesis	4497-136 (cw)
gene B	capsid morphogenesis	5075-51 (cw)
gene C	DNA maturation	133-393
gene D	capsid morphogenesis	390-848
gene E	cell lysis	568-843
gene F	major coat protein	1001-2284
gene G	major spike protein	2395-2922
gene H	minor spike protein, adsorption	2931-3917
gene J	core protein, DNA condensation	848-964
gene K	function unknown	51-221

(cw) = clockwise



References
(1) Sanger, F. et al. (1977) *Nature,* 265, 687–695.
(2) Sanger, F. et al. (1978) *J. Mol. Biol.,* 125, 225–246.