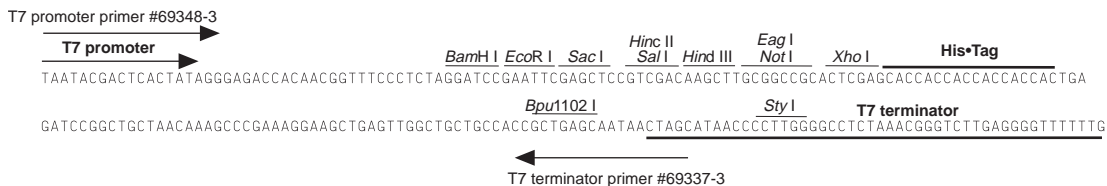
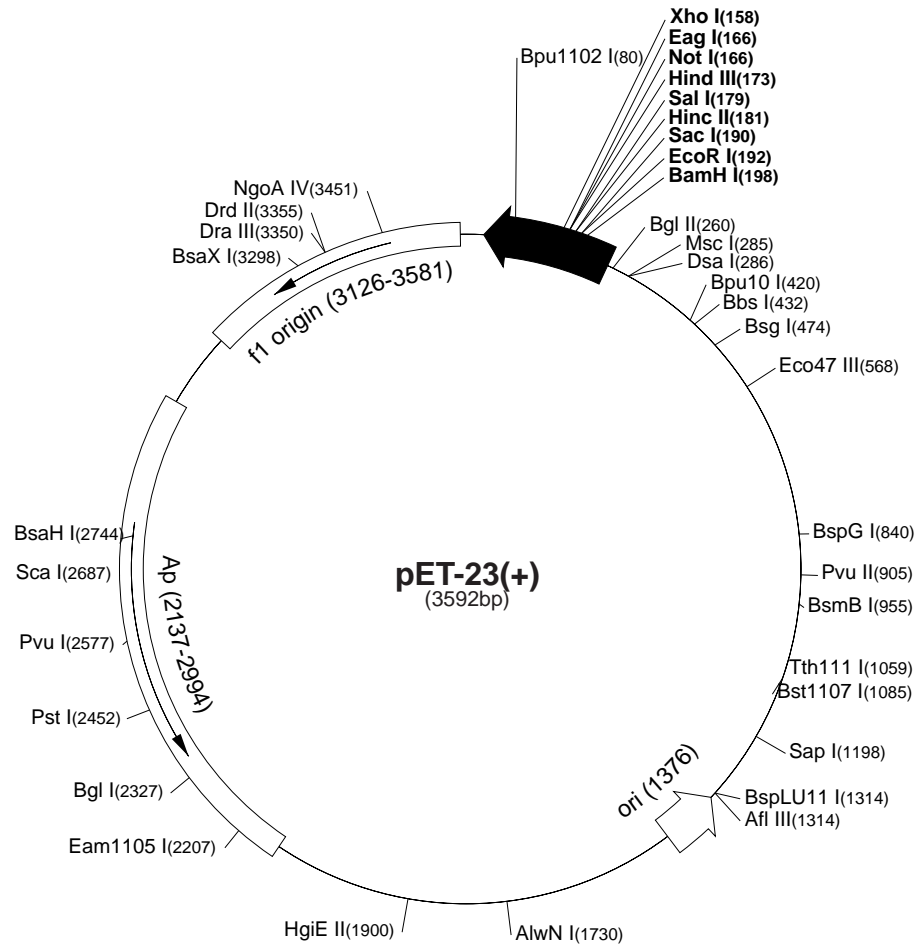


pET-23(+)⁺ Vector

pET-23(+)⁺ (Cat. No. 69771-3) is a transcription vector designed for expression from bacterial translation signals carried within a cloned insert. It therefore lacks the ribosome binding site and ATG start codon present on the pET translation vectors. A C-terminal His•Tag[®] sequence is available. Unique sites are shown on the circle map. Note that the sequence is numbered by the pBR322 convention, so the T7 expression region is reversed on the circular map. The cloning/expression region of the coding strand transcribed by T7 RNA polymerase is shown below. The f1 origin is oriented so that infection with helper phage will produce virions containing single-stranded DNA that corresponds to the coding strand. Therefore, single-stranded sequencing should be performed using the T7 terminator primer (Cat. No. 69337-3).

pET-23(+)⁺ sequence landmarks

T7 promoter	229-245
T7 transcription start	228
Multiple cloning sites (<i>Bam</i> H I - <i>Xho</i> I)	158-203
His•Tag coding sequence	140-157
T7 terminator	26-72
pBR322 origin	1376
<i>bla</i> coding sequence	2137-2994
f1 origin	3126-3581



pET-23(+)⁺ cloning/expression region

pET-23(+) Restriction Sites

Enzyme	# Sites	Locations	Enzyme	# Sites	Locations	Enzyme	# Sites	Locations		
AccI	2	180 1084	DraIII	1	3350	Scal	1	2687		
AccIII	5	823 964 1266 2506 3190	DrdI	3	1007 1422 3305	ScrFI	11			
Acil	48		DrdII	1	3355	SfaNI	13			
AflIII	1	1314	Dsal	1	286	Sfcl	5	228 1579 1770 2448 3569		
AluI	18		EaeI	3	166 283 2595	Sspl	2	3011 3142		
AlwI	13		EagI	1	166	StyI	1	57		
Alw21I	7	159 190 308 1132 1632	Eam1105I	1	2207	TaqI	7	159 180 190 257 1414		
		2793 2878	EarI	2	1198 3002			2858 3383		
Alw44I	3	1128 1628 2874	Ecil	3	1388 1534 2362	TaqII	6	1216 2555 2740 2893 2910		
AlwNI	1	1730	Eco47III	1	568			3254		
ApoI	3	192 3152 3163	Eco57I	2	1862 2874	TfiI	3	364 868 1289		
AvaI	2	158 264	EcoO109I	3	53 278 320	ThaI	16			
AvaII	5	278 320 599 2345 2567	EcoRI	1	192	TseI	21			
BamHI	1	198	EcoRII	4	280 1340 1461 1474	Tsp45I	6	753 966 1061 2463 2674		
BanI	2	2155 3387	FauI	8	244 329 610 796 1017			3523		
BanII	2	190 3425			1027 3487 3556	Tsp509I	8	192 244 2074 2380 2635		
BbsI	1	432	FokI	8	533 595 673 859 1000			3126 3152 3163		
BbvI	21				2173 2354 2641	Tth111I	1	1059		
BccI	5	2244 2368 2655 3340 3357	FspI	2	295 2429	Tth111III	4	775 1904 1911 1943		
Bce83I	5	21 1405 1703 1944 2812	GdiII	2	166 2595	UbaII	12			
BceII	2	1816 3376	HaeI	4	285 1329 1340 1792	VspI	2	243 2379		
BcgI	6	160 194 891 925 2712	HaeII	6	487 570 1192 1562 3501	XhoI	1	158		
		2746			3509	XmnI	2	872 2806		
Bfal	7	70 203 328 1809 2062	HaeIII	13		Enzymes that do not cut pET-23(+):				
		2397 3501	HgaI	6	850 1007 1425 2003 2733	AatII	AfIII	AgeI	ApaI	ApaBI
BglI	1	2327			3567	AscI	AvrII	BaeI	BclI	BmgI
BglIII	1	260	HgiEII	1	1900	BseRI	BsmI	BspMI	BsrGI	BssHII
BpmI	2	841 2277	HhaI	23		BstEII	BstXI	Bsu36I	Clal	EcoNI
Bpu10I	1	420	Hin4I	2	2206 2280	EcoRV	FseI	HpaI	KpnI	MluI
Bpu1102I	1	80	HincII	1	181	MunI	NarI	NcoI	NdeI	NheI
BsaI	2	227 2268	HindIII	1	173	NruI	NsiI	NspV	Pacl	PfIM
BsaAI	2	1066 3350	Hinfl	9	235 364 868 1214 1289	PmeI	PmlI	PshAI	RleAI	RsrII
BsaBI	2	259 511			1685 2202 3277 3299	SacII	SexAI	Sfil	Sgfl	SgrAI
BsaHI	1	2744	HphI	9	359 934 943 2050 2277	Smal	SnaBI	SpeI	SphI	SrfI
BsaJI	3	57 286 1474			2693 2899 2934 3351	Sse8387I	StuI	SunI	Swal	XbaI
BsaWI	5	2 503 1520 1667 2498	Maell	12		XcmI				
BsaXI	1	3298	MaellI	15						
Bsbl	2	1030 3257	MbolI	8	432 1185 1976 2047 2802					
BscGI	10	44 290 675 1008 1641			2880 2989 3490					
		1987 2208 2232 2754 3444	MmeI	3	1529 1713 3327					
BsgI	1	474	MnlI	19						
Bsil	2	1487 2871	MscI	1	285					
BsiEI	5	169 1230 1654 2577 2726	Msel	20						
BsII	12		MslI	6	301 496 887 2459 2618					
BsmAI	4	227 955 2268 3044			2977					
BsmBI	1	955	MspI	17						
BsmFI	2	585 3565	MspA1I	6	84 905 1024 1656 1901					
BsoFI	33				2842					
Bsp24I	4	1807 1839 1985 2017	Mwol	18						
Bsp1286I	8	159 190 308 1132 1632	NciI	7	324 652 958 993 1694					
		2793 2878 3425			2390 2741					
BspEI	2	2 503	NgoAIV	1	3451					
BspGI	1	840	NlaIII	14						
BspLU111	1	1314	NlaIV	15						
BsrI	14		Nott	1	166					
BsrBI	3	1247 3048 3494	NspI	3	659 951 1318					
BsrDI	2	2268 2442	Pfl1108I	1	2225					
BsrFI	2	2287 3451	PleI	6	243 1208 1693 2196 3285					
Bst1107I	1	1085			3293					
BstYI	10	132 198 260 506 1955	Psp5II	2	278 320					
		1966 2052 2064 2832 2849	Psp1406I	4	639 2433 2806 3135					
Cac8I	15		PstI	1	2452					
CjeI	10	1327 1360 1801 1834 1879	PvuI	1	2577					
		1882 1912 1915 1979 2012	PvuII	1	905					
CjePI	10	1801 1833 1834 1866 1979	RcaI	2	2034 3042					
		2012 2099 2132 2571 2604	RsaI	2	1120 2687					
CviJI	55		SacI	1	190					
CviRI	13		Sall	1	179					
Ddel	10	80 101 136 420 582	SapI	1	1198					
		1122 1589 1998 2164 2704	Sau96I	10	53 278 320 599 786					
DpnI	19				2249 2328 2345 2567 3341					
DraI	3	2073 2092 2784	Sau3AI	19						