pET-21a-d(+) Vectors

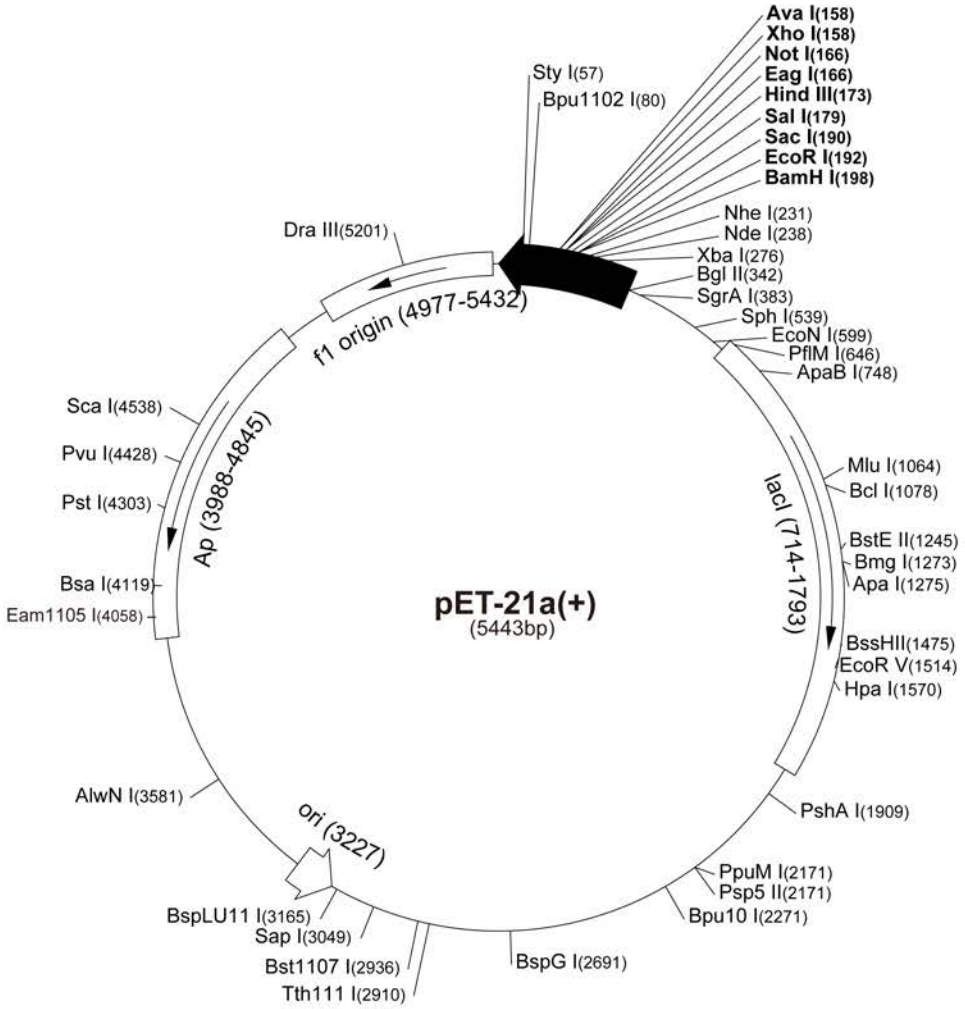
	Cat. No.
pET-21a DNA	69740-3
pET-21b DNA	69741-3
pET-21c DNA	69742-3
pET-21d DNA	69743-3

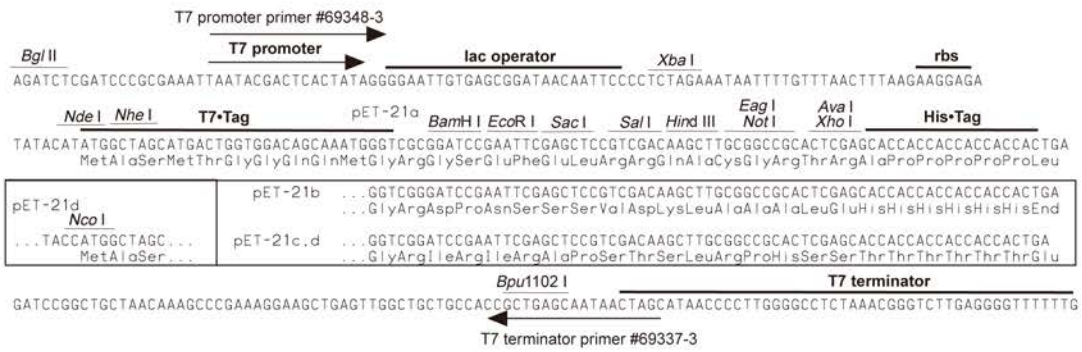
The pET-21a-d(+) vectors carry an N-terminal T7•Tag® sequence plus an optional C-terminal His•Tag® sequence. These vectors differ from pET-24a-d(+) only by their selectable marker (ampicillin *vs.* kanamycin resistance). Unique sites are shown on the circle map. Note that the sequence is numbered by 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-21a(+) sequence landmarks

T7 promoter	311-327
T7 transcription start	310
T7•Tag coding sequence	207-239
Multiple cloning sites (*Bam*H I - *Xho* I)	158-203
His•Tag coding sequence	140-157
T7 terminator	26-72
lacI coding sequence	714-1793
pBR322 origin	3227
bla coding sequence	3988-4845
f1 origin	4977-5432

The maps for pET-21b(+), pET-21c(+) and pET-21d(+) are the same as pET-21a(+) (shown) with the following exceptions: pET-21b(+) is a 5442bp plasmid; subtract 1bp from each site beyond *Bam*H I at 198. pET-21c(+) is a 5441bp plasmid; subtract 2bp from each site beyond *Bam*H I at 198. pET-21d(+) is a 5440bp plasmid; the *Bam*H I site is in the same reading frame as in pET-21c(+). An *Nco* I site is substituted for the *Nde* I site with a net 1bp deletion at position 238 of pET-21c(+). As a result, *Nco* I cuts pET21d(+) at 234, and *Nhe* I cuts at 229. For the rest of the sites, subtract 3bp from each site beyond position 239 in pET-21a(+). *Nde* I does not cut pET-21d(+). Note also that *Sty* I is not unique in pET-21d(+).





pET-21a-d(+) cloning/expression region

pET-21a(+) Restriction Sites

Enzyme	# Sites	Locations				
AccI	2	180	2935			
AceIII	8	831	1559	1890	2674	2815
		3117	4357	5041		
AciI	81					
AflIII	2	1064	3165			
AluI	25					
AlwI	16					
Alw21I	9	159	190	564	1048	2159
		2983	3483	4644	4729	
Alw44I	4	1044	2979	3479	4725	
AlwNI	1	3581				
ApaI	1	1275				
ApaBI	1	748				
ApoI	4	192	1339	5003	5014	
AvaI	1	158				
AvaII	7	1616	1992	2080	2171	2450
		4196	4418			
BamHI	1	198				
BanI	9	386	407	521	984	1703
		1833	1959	4006	5238	
BanII	5	190	448	462	1275	5276
BbsI	4	1210	1549	1923	2283	
BbvI	26					
BccI	21					
Bce83I	7	21	1878	2048	3256	3554
		3795	4663			
BcefI	5	583	924	1551	3667	5227
BcgI	11					
BclI	1	1078				
BfaI	8	70	232	277	2179	3660
		3913	4248	5352		
BglI	2	2128	4178			
BglII	1	342				
BmgI	1	1273				
BpmI	5	902	1391	2025	2692	4128
Bpu10I	1	2271				
Bpu1102I	1	80				
BsaI	1	4119				
BsaAI	2	2917	5201			
BsaBI	3	341	347	2362		
BsaHI	6	387	408	522	1021	1704
		4595				
BsaJI	6	57	501	507	1699	2137
		3325				
BsaWI	7	2	1383	1886	2354	3371
		3518	4349			
BsaXI	2	1723	5149			
BsbI	2	2881	5108			
BscGI	13					
BsgI	3	915	1115	2325		
BsiI	2	3338	4722			
BsiEI	6	169	1849	3081	3505	4428
		4577				
BsII	20					
BsmAI	7	761	1166	1292	1679	2806
		4119	4895			
BsmBI	2	1679	2806			
BsmFI	4	525	2066	2436	5416	
BsoFI	46					
Bsp24I	12					
Bsp1286I	13					
BspEI	2	2	2354			
BspGI	1	2691				
BspLU11I	1	3165				
BsrI	26					
BsrBI	4	297	3098	4899	5345	
BsrDI	4	1111	1477	4119	4293	
BsrFI	7	374	383	750	1962	2122
		4138	5302			
BssHII	1	1475				
Bst1107I	1	2936				
BstEII	1	1245				

Enzyme	# Sites	Locations				
BstXI	3	866	995	1118		
BstYI	12					
Cac8I	39					
CjeI	26					
CjePI	20					
CviJI	86					
CviRI	24					
DdeI	11					
DpnI	27					
DraI	3	3924	3943	4635		
DraIII	1	5201				
DrdI	3	2858	3273	5156		
DrdII	2	787	5206			
DsaI	2	501	2137			
EaeI	5	166	372	504	1738	4446
EagI	1	166				
Eam1105I	1	4058				
EarI	3	682	3049	4853		
EciI	4	841	3239	3385	4213	
Eco47III	3	469	1970	2419		
Eco57I	2	3713	4725			
EcoNI	1	599				
Eco0109I	3	53	497	2171		
EcoRI	1	192				
EcoRII	7	787	1102	1642	1699	3191
		3312	3325			
EcoRV	1	1514				
FauI	17					
FokI	10	1110	1119	2384	2446	2524
		2710	2851	4024	4205	4492
FspI	2	2146	4280			
GdiII	5	166	372	504	1738	4446
HaeI	5	792	2113	3180	3191	3643
HaeII	14					
HaeIII	24					
HgaI	12					
HgiEII	2	662	3751			
HhaI	45					
Hin4I	3	963	4057	4131		
HincII	2	181	1570			
HindIII	1	173				
HinfI	14					
HpaI	1	1570				
HphI	16					
MaeII	15					
MaeIII	18					
MboII	14					
MluI	1	1064				
MmeI	3	3380	3564	5178		
MnlI	26					
MseI	28					
MslI	9	1116	1404	1434	2152	2347
		2738	4310	4469	4828	
MspI	31					
MspA1I	9	84	1094	1664	1757	2756
		2875	3507	3752	4693	
MwoI	38					
NarI	4	387	408	522	1704	
NciI	12					
NdeI	1	238				
NgoAIV	4	374	1962	2122	5302	
NheI	1	231				
NlaIII	25					
NlaIV	25					
NotI	1	166				
NspI	4	539	2510	2802	3169	
Pfl1108I	2	1951	4076			
PflMI	1	646				
PleI	9	325	613	700	1496	3059
		3544	4047	5136	5144	
PshAI	1	1909				
Psp5II	1	2171				

Enzyme	# Sites	Locations				
Psp1406I	6	726	2094	2490	4284	4657
		4986				
PstI	1	4303				
PvuI	1	4428				
PvuII	3	1664	1757	2756		
RcaI	3	462	3885	4893		
RsaI	3	1211	2971	4538		
SacI	1	190				
SalI	1	179				
SapI	1	3049				
Sau96I	18					
Sau3AI	27					
ScaI	1	4538				
ScrFI	19					
SfaNI	20					
SfcI	5	310	3430	3621	4299	5420
SgrAI	1	383				
SphI	1	539				
SspI	2	4862	4993			
StyI	1	57				
TaqI	13					
TaqII	9	972	1190	1863	3067	4406
		4591	4744	4761	5105	
TfiI	5	1743	2045	2215	2719	3140
ThaI	35					
TseI	26					
Tsp45I	8	1245	2073	2604	2817	2912
		4314	4525	5374		
Tsp509I	16					
Tth111I	1	2910				
Tth111II	6	903	1596	2626	3755	3762
		3794				
UbaJI	20					
VspI	4	325	1749	1808	4230	
XbaI	1	276				
XcmI	3	920	1436	1454		
XhoI	1	158				
XmnI	2	2723	4657			

Enzymes that do not cut pET-21a(+):

AatII	AflII	AgeI	AscI	AvrII
BaeI	BseRI	BsmI	BspMI	BsrGI
Bsu36I	ClaI	FseI	KpnI	MscI
MunI	NcoI	NruI	NsiI	NspV
PacI	PmeI	PmlI	RleAI	RsrII
SacII	SexAI	SfiI	SgfI	SmaI
SnaBI	SpeI	SrfI	Sse8387I	StuI
SunI	SwaI			