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Table 26-1. Bacteriophage P4 genes and functions.

gene or site	gene product and/or function encoded
<i>cos</i>	19 nt long cohesive ends.
<i>P<sub>gop</sub></i>	promoter of the <i>gop-β</i> operon.
<i>gop</i>	causes host cell killing in the absence of <i>β</i> .
<i>β</i>	inhibits <i>gop</i> killing.
<i>t<sub>cII</sub></i>	Rho-independent transcription termination site.
<i>cII</i>	function unknown. Mutants kill the host cell.
<i>P<sub>cII</sub></i>	promoter of the <i>cII</i> gene.
<i>int</i>	integrase.
<i>P<sub>int</sub></i>	promoter of the <i>int</i> gene.
<i>att</i>	site for integrative recombination.
<i>crr</i>	required in <i>cis</i> for replication of both <i>oriI</i> and <i>oriIII</i> replicons.
<i>t<sub>α</sub></i>	Rho-independent transcription termination site.
<i>α</i>	essential for replication; primase, helicase, <i>oriI</i> and <i>crr</i> recognition and binding.
<i>ori2</i>	with <i>crr</i> supports <i>α</i> -dependent <i>oriI</i> -independent replication ( <i>oriIII</i> replicon).
<i>cnr</i>	controls DNA replication and plasmid copy number; interacts with <i>α</i> protein.
<i>t<sub>151</sub></i>	putative transcription terminator.

<i>orf151</i>	function unknown.
$\epsilon$	derepression of the P2 helper prophage.
<i>kil</i>	kills the bacterial host if overexpressed.
<i>t<sub>imm</sub></i>	Rho-dependent transcription terminator. Elicits strong transcription termination from P <sub>LE</sub> when the CI RNA is present.
<i>t<sub>4</sub></i>	Rho-independent, CI RNA-dependent transcription termination site.
<i>cI</i>	prophage immunity. Encodes the CI RNA.
<i>t<sub>1</sub></i>	Rho-independent transcription termination site.
<i>P<sub>LE</sub></i>	constitutive promoter.
<i>eta</i>	function of gene product unknown. Its translation prevents transcription termination from P <sub>LL</sub> .
<i>vis</i>	binds P <sub>LL</sub> , P <sub>sid</sub> , and <i>att</i> ; negative regulator of P <sub>LL</sub> ; stimulates P <sub>sid</sub> ; excisionase.
<i>P<sub>LL</sub></i>	late promoter; positively regulated by P4 gp $\delta$ and P2 Ogr and Cox; negatively regulated by Vis.
<i>oriI</i>	origin of DNA replication.
<i>P<sub>sid</sub></i>	late promoter; positively regulated by P4 $\delta$ and P2 Ogr, stimulated by Vis.
<i>sid</i>	small head determination; procapsid external scaffold.
$\delta$	P4 and P2 late promoter activator.
<i>psu</i>	polarity suppression; capsid decoration protein.
<i>t<sub>sid</sub></i>	Rho-independent transcription termination site.

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