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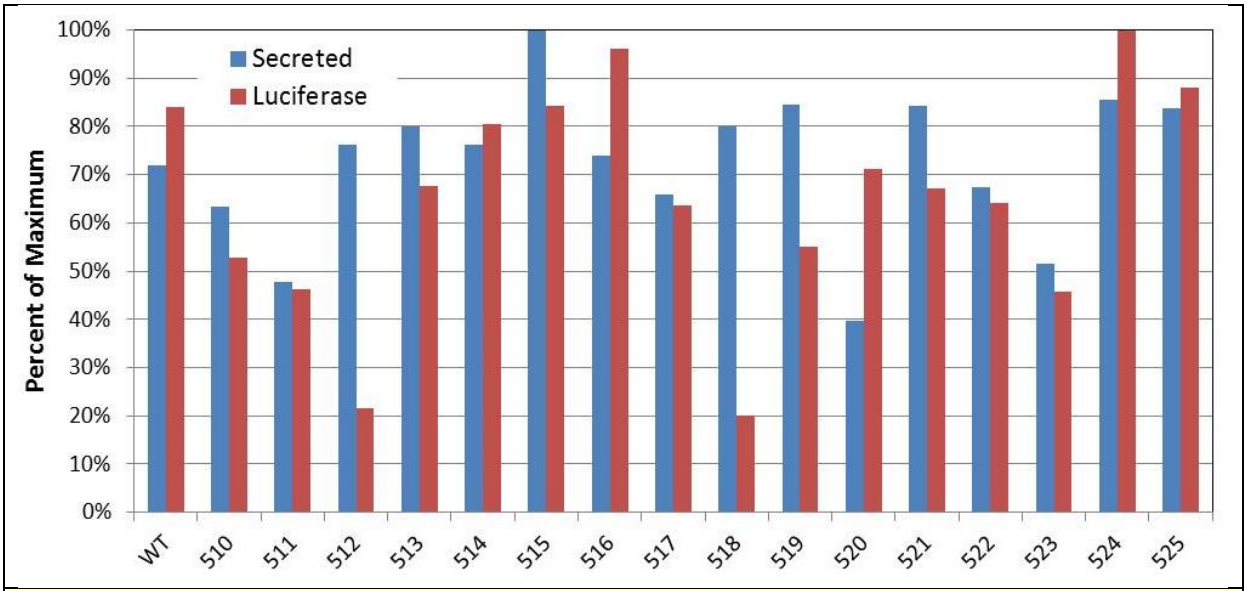
pMAX-CMV Variant Panel

Product ID: MX19-003

The promoter of the immediate-early gene of the human cytomegalovirus (CMV) is frequently used for high-level expression of genes in mammalian cells. Strong expression may not be suitable for all gene products in all situations. Over-expression can result in saturating the cellular machinery and processing mechanisms to the detriment of protein quality (e.g., poor secondary modifications, degradation).

The combined promoter/enhancer sequence typically used is 595 bp in size and contains many repeated elements. A more reduced size promoter can allow for larger genetic payloads in certain situations where size is constrained, as in the commonly used adeno-associated viral vectors.

Maxygen has applied its molecular breeding technology to the promoter region of human CMV and related cytomegaloviruses to create multiple variant promoter sequences. The resulting variants show varying degrees of activity. Certain variants give higher expression of secreted proteins compared to a cytoplasmic protein ((luciferase) as shown in the Figure below; testing the variants with a specific gene-of-interest may identify a promoter variant that is particularly well suited for a given use.



Histogram of activities given by wild-type (WT) and variant CMV promoters (510-525) expressing a cytoplasmic enzyme (luciferase) and a secreted protein 48-72 hours after transient transfection of HEK293 cells. The relative activities will likely vary in different laboratories as a function of plasmid quality, cell growth conditions, and transfection protocol.

During the molecular breeding, repeated sequences were eliminated in some of the variants, resulting in shorter forms of active promoters. The size of the CMV promoter/enhancer region in each of the variants is summarized in the Tables below.

Plasmid	bp
MAX0510	336
MAX0511	330
MAX0512	402
MAX0513	459

Plasmid	bp
MAX0514	458
MAX0515	460
MAX0516	459
MAX0517	459

Plasmid	bp
MAX0518	402
MAX0519	595
MAX0520	273
MAX0521	455

Plasmid	bp
MAX0522	402
MAX0523	516
MAX0524	627
MAX0525	515

The luciferase-expressing plasmids in this panel are available (along with the plasmid containing the wild-type promoter) in quantities of 1 µg per plasmid. The promoters can be amplified by PCR or the luciferase coding sequence can be replaced using convenient restriction sites.