

Product Specification Sheet

**PAPP3, repeat-sequence peptide of the *P. berghei* circumsporozoite protein (CSP)**

□ Cat. # PAPP31-P

(PAPPNAAND)<sub>3</sub> peptide *P. berghei*, CSP

**SIZE:** 1 mg

Malaria is a severe and debilitating disease caused by the parasitic protozoan *Plasmodium*, which is transmitted by many species of anopheline mosquitoes. Four *Plasmodium* species, namely, *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale* and *Plasmodium malariae* infect humans. *Plasmodium berghei* infects rodents. *P. falciparum* is the most widespread and also the most serious and potentially fatal form of *Plasmodium* species. Recent estimates of the annual number of clinical malaria cases worldwide range from 214 to 397 million. Estimates of annual mortality (nearly all from *P. falciparum* malaria) are thought to be around 1.1 million. The life cycle of the malaria is complex, with phases both in human host and the insect vector, the female anopheline mosquito. There are several *Plasmodium* forms: sporozoites, merozoites, gametocytes, gametes, ookinets, oocysts. Parasite may encode in the order of 2000 proteins, several hundred of which are antigenic. The development of a malaria vaccine is one of the highest priorities in infectious disease research, as such a vaccine could be enormously helpful in reducing the 500 million new Plasmodium infections and over 1 million deaths due to malaria annually.

The circumsporozoite protein-1 (CSP-1), an approximate 60 kDa protein located on the surface of developing and mature sporozoites and present in developing exoerythrocytic forms is the best-characterized protein of sporozoites. It constitutes the major surface protein of the sporozoite and is a multifunctional molecule that plays a crucial role at various points of the malaria life cycle. The CSP-1 is synthesized as a precursor protein of 67 kDa, which is processed by removal of approximately 50-100 residues to generate the mature protein of 58 kDa. The central domain of CSP-1 is composed of an extensive array of tandemly repeated short sequences. CSP of *P. berghei* has a total of 13 copies of three octapeptides PPPNPND, PPPNAND and PAPPNAND.

A synthetic peptide, (DPAPPNAN)<sub>2</sub>D reproducing the PAPPNAN repeat of the *P. berghei* CS protein was employed in studies along with (DPPPPNPN)<sub>2</sub>D. Its efficacy was decreased as compared to the latter. The peptide immunogenic analogs containing at least two and up to 12 repeat sequences of PAPPNAND were made by recombinant DNA techniques. Vaccines were prepared from these analogs, which have sporozoite neutralizing activity or ameliorate or prevent malaria by other mechanisms. Analogues were formulated into the vaccine as neutral or salt form.

**Specificity**

PAPP3 shares 88% of identity with (PAPPNAND)<sub>3</sub> polypeptide of *P. berghei* CSP, it has 3 additional Ala residues as compared to the latter. The *P. berghei* CSP sequence, NCBI database accession number P06915, is given below:

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1  mkketilvva slllvnsllp gygqnkiiga qrnlnelcyn egndnklyhv lnsknkiy
61  nrtvnrllpm lrrkknekkn ekiernnklk qppppnpnd pppnpndpp pnpndpppp
121 nndppppna ndppppnand pappnandpa ppnandpapp nandpappna ndpappnand
181 pappnandpp pppndpapp ggnnnpqap rqrqrqrqr rqrqrqrqr rqrqrqrqr
241 nnnknndnd dsyipsaeki lefvkqirds iteewsqcqv tcgsgirvrk rkgsnkkaed
301 ltledidtei ckmdkcssif nivnsnslgfv illvlvffn

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**Sources of Peptides**

Cat. # PAPP31-P

Sequence: PAPPNAAND PAPPNAAND PAPPNAAND  
Mol. Wt: 2562  
Formula: C<sub>108</sub>H<sub>161</sub>N<sub>33</sub>O<sub>40</sub>  
Form: Powder  
Solubility: not tested  
Storage: Store powder at -20°C for up to 6 months.

After reconstitution in water, store solution in small aliquots at -20°C for 3-6 months. Do not freeze and thaw or store diluted solutions.

**General References:** Zavala F. et al (1987) J. Exp. Med., 166, 1591-1596; Barr P.J. et al (1990) Patent WO/11775.

**Related items:**

Cat. #	Description
NANP51-P, NANP51-BSA	repeat-sequence peptide of <i>P. falciparum</i> CSP/ its BSA conjugate
NANP101-P	repeat-sequence peptide of <i>P. falciparum</i> CSP
NVDP41-P, NVDP41-BSA	repeat-sequence peptide of <i>P. falciparum</i> CSP/ its BSA conjugate
DRAA31-P, DRAA31-BSA	repeat-sequence peptide of <i>P. vivax</i> CSP/ its BSA conjugate
DRAD31-P	repeat-sequence peptide of <i>P. vivax</i> CSP
PPPP311-P	repeat-sequence peptide of <i>P. berghei</i> CSP
PPPP321-P, PPPP321-BSA	repeat-sequence peptide of the <i>P. berghei</i> CSP/ its BSA conjugate

*\*This product is for In vitro research use only.*

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