

## Product Information

### Protein Kinase C $\alpha$ Isozyme, human Recombinant

Catalog Number **P1782**  
Storage Temperature  $-70\text{ }^{\circ}\text{C}$

Synonym: PKC Alpha

#### Product Description

Protein Kinase C (PKC) is a serine/threonine kinase first characterized by Nishizuka<sup>1</sup> on the basis of its activation *in vitro* by  $\text{Ca}^{2+}$ , phospholipid (primarily phosphatidylserine), and diacylglycerol (DAG). The calculated molecular mass of the native protein based on its cDNA sequence is 76.8 kDa, but its apparent molecular mass based on SDS-PAGE is 80-81 kDa.<sup>2</sup>

PKC is activated intracellularly by signal transduction pathways that produce DAG along with some lysophospholipids and fatty acids, from phosphatidylinositol diphosphate (PIP2) and phosphatidylcholine (PC) through the action of various activated phospholipases. Phorbol esters can also stimulate PKC, probably by a mechanism similar to that used by DAG, and has therefore been a useful tool in the study of PKC.

PKC plays an important role in the regulation of diverse cellular functions.<sup>3-10</sup> In humans, at least 11 different PKC polypeptides have been identified. These isoforms can be grouped into three subfamilies and include alpha, beta I, beta II, gamma, delta, epsilon, zeta, eta, theta, mu, and iota. These isoforms differ in primary structure, tissue distribution, subcellular localization, mode of action *in vitro*, response to extracellular signals, and substrate specificity.<sup>3</sup> PKC : alpha, beta I, beta II, and gamma form the first family and their activities are  $\text{Ca}^{2+}$  and phospholipid-dependent, while delta, epsilon, eta, and theta PKC comprise the second family and are  $\text{Ca}^{2+}$ -independent, but phospholipid-dependent. PKC zeta, mu, and iota form the third family and are not activated by phorbol esters or DAG.

This product is a human recombinant protein produced by Baculovirus-mediated expression in insect cells. This protein is purified to near homogeneity ( $\geq 95\%$  by SDS-PAGE), and therefore may behave differently from crude preparations. One unit is defined as the amount of enzyme necessary to transfer 1 pmol of phosphate to Histone in 1 minute at  $30\text{ }^{\circ}\text{C}$  at pH 7.4.

This product is supplied as a buffered aqueous glycerol solution, containing Trizma buffer, NaCl, DTT, and glutathione. Other components are present in the solution, and lot-specific information on these components may be obtained from Technical Service.

#### Storage/Stability

Store the product at  $-70\text{ }^{\circ}\text{C}$ .

#### Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

#### References

1. Nishizuka, Y., *Science*, **233(4761)**, 305-312 (1986).
2. Hug, H., and Sarre, T.F., *Biochem. J.*, **291(Pt 2)**, 329-343 (1993).
3. Jaken, S., *Curr. Opin. Cell Biol.*, **8(2)**, 168-173 (1996).
4. Kazanietz, M.G., *et al.*, *Mol. Pharmacol.*, **44(2)**, 298-307 (1993).
5. Newton, A.C., *J. Biol. Chem.*, **270(48)**, 28495-28498 (1995).
6. Epand, R.M., *Anal. Biochem.*, **218(2)**, 241-247 (1994).
7. Dekker, L.V., and Parker, P.J., *Trends Biochem. Sci.*, **19(2)**, 73-77 (1994).
8. Nishizuka, Y., *Science*, **258(5082)**, 607-614 (1992).
9. Asaoka, Y., *et al.*, *Trends Biochem. Sci.*, **17(10)**, 414-417 (1992).
10. Bell, R.M., and Burns, D.J., *J. Biol. Chem.*, **266(8)**, 4661-4664 (1991).

<b>PKC Isozyme Reference Guide</b>						
<b>Isoform</b>	<b>Type</b>	<b>Calcium Dependent</b>	<b>Phorbol stimulation</b>	<b>Predicted MW</b>	<b>Apparent MW</b>	<b>Suggested Substrates</b>
Alpha	Conventional	Yes	Yes	76.8 kDa	80-81 kDa	alpha pseudosubstrate peptide, Histone
beta I	Conventional	Yes	Yes	76.8 kDa	79-80 kDa	alpha pseudosubstrate peptide, Histone
beta II	Conventional	Yes	Yes	76.9 kDa	80 kDa	alpha pseudosubstrate peptide, Histone
gamma	Conventional	Yes	Yes	78.4 kDa	77-84 kDa	alpha pseudosubstrate peptide, Histone
delta	Novel	No	Yes	77.5 kDa	74-79 kDa	alpha and epsilon pseudosubstrate peptides
epsilon	Novel	No	Yes	83.5 kDa	89-96 kDa	alpha and epsilon pseudosubstrate peptides
eta	Novel	No	Yes	77.9 kDa	82-84 kDa	alpha and epsilon pseudosubstrate peptides
zeta	Atypical	No	No	67.7 kDa	76-80 kDa	alpha and epsilon pseudosubstrate peptides