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JOURNAL ARTICLE

Platelet-activating factor acetylhydrolase activity in bovine seminal plasma

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Platelet-activating factor (PAF) is a potent signaling molecule that has been detected in mammalian sperm from several species. The biological function of sperm-derived PAF and mechanisms controlling its production have not been clearly defined. In the remodeling pathway for PAF biosynthesis, PAF is produced by phospholipase A2 hydrolysis of 1-O-alkyl phospholipids followed by acetylation by PAF acetyltransferase. PAF is inactivated by PAF acetylhydrolase. PAF acetylhydrolase activity has been detected recently in human seminal plasma, where it may play a role in regulating PAF production or content by sperm. The purpose of this study was to measure and partially characterize PAF acetylhydrolase in bovine seminal plasma. Acetylhydrolase activity was detected in seminal plasma, was linear with time and protein concentration, and had a specific activity of 122 nmol/minute/mg protein. The enzyme was cation independent and was not inhibited by phosphatidylcholine but was inhibited by p-bromophenacyl bromide and partially inhibited by phenylmethylsulfonyl fluoride. Very little acetylhydrolase activity was detected in caudal epididymal fluid or caudal epididymal sperm. Enzyme activity associated with ejaculated sperm was largely removed by their centrifugation through Percoll and subsequent washing. These results demonstrate very high PAF acetylhydrolase activity in bovine seminal plasma. The enzyme appears to be of accessory gland origin and has properties similar to those of the enzyme from other sources.

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