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Phenylpropanoids which are widely distributed in vegetable kingdom, have anti-inflammatory activity on carrageenan-induced rat paw edema. Their mechanisms are not clear. In this study, to find out their mechanism, effect of phenylpropanoids on phospholipase A2 (PLA2) activity were examined in the silica-induced [³H]arachidonic acid release in RAW 246.7 cells. Silica stimulated PLA2 activity in a dose dependent manner. Phenylpropanoids have dose-dependently decreased the [³H]arachidonic acid release in RAW 246.7 cells. Silica-induced PLA2 activity was significantly inhibited by sinapinic acid and quinic acid at a concentration of more than 10 μ M, but was not affected by other phenylpropanoids, such as cinnamic acid, p-coumaric acid, caffeic acid, ferulic acid and chlorogenic acid at 100 μ M. It shows that quinic acid has the most activity. Quinic acid and sinapinic acid at a concentration of 10 μ M decrease significantly the [³H]arachidonic acid release in RAW 246.7 cells. These results indicated that the more has hydroxy group of benzene ring, the more has potent inhibitory activity of phospholipase A2 activity.

[PB2-3] [10/18/2001 (Thr) 14:00 - 17:00 / Hall D]

Inhibitory Action of Phenylpropanoids on Silica-induced Reactive Oxygen Species Generation in RAW 246.7 cells

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Silica which is a typical fibrogenic particles in many occupations including coal mining, quarrying and sandblasting induced acute inflammatory response and fibrosis in lung. we reported that structure-activity of phenylpropanoids on anti-inflammatory activity on carrageenan-induced rat paw edema. Their mechanisms are not clear. In this study, to find out their mechanism, effect of phenylpropanoids on reactive oxygen species (ROS) generation were examined in RAW 246.7 cells. Silica stimulated ROS generation in a dose dependent manner. Phenylpropanoids have dose-dependently decreased ROS generation in RAW 246.7 cells. It shows that chlorogenic acid has the most activity. Chlorogenic acid and caffeic acid at a concentration of 1 μ M decrease significantly ROS generation, and also ferulic acid and sinapinic acid at a concentration of 10 μ M decrease significantly ROS generation in RAW 246.7 cells. These result indicated that cinnamic and p-coumaric acid has not active, but the more has hydroxy group of benzene ring, the more has potent inhibitory activity of ROS generation.

[PB2-4] [10/18/2001 (Thr) 14:00 - 17:00 / Hall D]

Inhibitory Action of Cinnamic Acids Derivatives on Silica-induced Peroxynitrite Generation in RAW 246.7 Cells

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C6-C3 compound, cinnamic acid derivatives are widely distributed in vegetable kingdom. Recently, we reported that structure-activity of cinnamic acid derivatives on anti-asthmatic activity in the increase of specific airway resistance of ovalbumin-sensitized guinea pig and anti-inflammatory activity on carrageenan-induced rat paw edema, respectively. Their mechanisms are not clear. In this study, to find out their mechanism, effect of cinnamic acid derivatives on peroxynitrite (PON) generation were examined in RAW 246.7 cells. Silica stimulated PON generation in a dose dependent manner. Cinnamic acid derivatives have dose-dependently decreased PON generation in RAW 246.7 cells. It shows that ferulic acid has the most activity. Ferulic acid, caffeic acid and chlorogenic acid at a concentration of 1 μ M decrease significantly PON generation, and also quinic acid, coumaric acid and sinapinic acid at a concentration of 10 μ M decrease significantly PON generation in RAW 246.7 cells. These result indicated