P32 Induction of Inflammation Inhibits Taurine Transporter Activity in Murine Macrophage Cell Line

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Taurine is synthesized in the body or uptaken from dietary and is distributed in the various organs. It differs from other amino acids by virtue of the fact that a sulfonic acid group replaces the carboxyl group of what would be β-alanine. In order to function within the cell it must be transported into the cells by taurine transporter that is spanned 12 transmembrane domains. The human taurine transporter has long cytoplasmic carboxy and amino termini that may function as regulatory attachment sites for other proteins. Six potential protein kinase C(PKC) phosphorylation sites have been reported in human taurine transporter. Macrophage has the taurine transporter and activation of macrophage could affect the transporter. To address whether macrophage activating reagents could inhibit or activate the transporter activities in macrophage, RAW264.7 was used for taurine transporter activity assay. When the cell was treated with PMA for 24 hrs, taurine transportation was decreased concentration dependant manner. When LPS was added to this system, taurine transportation was reduced concentration dependantly. Various treatment time with PMA and LPS led to decrease in time dependent fashion. When various concentrations of IFN was treated to the cell in the presence of various concentrations of LPS, taurine transportation was decreased concentration dependently. Combination treatment of the cell with IFN and TNF also led to the decrease of taurine uptake. When the cell was treated with LPS, TNF, IFN, LPS + IFN, LPS + TNF, IFN + TNF and LPS + IFN

+ TNF in the presence or absence of NAME, inhibitor of iNOS, only LPS + IFN treated cell was recovered taurine uptake. From these results, infection with Gram-negative bacteria or infection-induced cytokines might be responsible for blocking of taurine uptake in the macrophage cells.

Table 1. Treatment of PMA reduced taurine transporter activities in murine macrophage cell line, RAW264.7.

PMA Conc. (ng/ml)	Treatments Time		
	30 min	12 hr	24 hr
Control (PBS)		300 ± 8	
1	245 ± 7*	226 ± 4*	138 ± 5*
10	198 ± 7*	162 ± 2*	109 ± 4*
100	166 ± 2*	136 ± 7*	104 ± 2*
1,000	123 ± 2*	114 ± 0*	79 ± 4*

(* P>0.01 compared to control group)

Conclusion

1) PMA decreased TAU transportation in concentration and time manner.
2) LPS, IFN-γ, and TNF-α also decreased TAU transportation in concentration dependent manner.
3) In the presence of NAME, taurine uptake was recovered by the treatments of LPS, LPS + TNF-α, and IFN-γ + TNF-α.
4) Infection with G(-) bacteria or infection-induced cytokines might be responsible for the inhibition of taurine transportation in macrophages.