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Lipocalin-2 role in transferrin receptor 1 dependent and independent iron uptake in cultured rat primary hepatocytes

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Lipocalin-2 (LCN-2) is a 25-KDa secretory protein currently used as a biomarker for renal injury and inflammation. The Lcurrent study shows LCN-2 role in iron transport in cultured rat hepatocytes through transferrin receptor1 dependent and independent pathway. Rat hepatocytes were treated with different concentrations of FeCl3 (0.01mM, 0.1mM and 0.5mM), acute phase cytokines (IL-1 β , IL-6, TNF- α 100ng/ml) and both together. Then cells were harvested for mRNA and protein isolation at different time points (6, 12, 24 hours) after treatment.mRNA analysis showed upregulation of LCN-2 and TfR1 in cytokines (IL-1 β , IL-6, TNF- α) treated hepatocytes, with maximum LCN-2 fold change 6.83±0.983-folds and TfR1 7.485±1.735-folds at 24h of IL-1 β treated hepatocytes. LCN2 was upregulated in FeCl3 treated hepatocytes with maximum 2.726±0.613-folds at 24h of treatment while TfR1 was downregulated in these cells. In cytokines+FeCl3 treated hepatocytes both LCN-2 and TfR1 were upregulated.

Protein analysis by western blotting confirms the mRNA analysis data showing similar gene expression trends of LCN-2 and TfR1 in cultured hepatocytes.

Our results suggest that LCN-2 is involved in iron transport to hepatocytes not only through TfR1 mediated iron uptake pathway, but rather independently of TfR1 mediated pathway. Because when TfR1 showed downregulation, at the same time point LCN-2 was upregulated in FeCl3treated hepatocytes.

In cytokines treated hepatocytes the fold change of LCN-2 and TfR1 was almost similar, while in cytokines+ FeCl3 treated hepatocytes the fold change of LCN-2 (12.813±2.101) was more than TfR1 fold change (7.163±2.52-folds). These findings suggest that LCN-2 transports iron to hepatocytes by both TfR1 dependent and TfR1 independent pathways

Biography

Shakil Ahmad completed his M.Phil in Molecular Cell Biology from King Edward Medical University, Lahore Pakistan. Now he is doing his PhD (2010-2013) in Biology from University Hospital Georg-August University Goettingen, Germany. He has published two papers as co-author in reputed journals. He presented many abstracts in different Scientific Conferences and one of his abstract "Fpn1 is a nuclear negative acute phase protein in rat liver" presented in DGF 2012 Hamburg-Germany, as co-author won price

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