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Transferrin Receptors and Hematopoiesis: Review

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The effectiveness of hematopoiesis depends on hematopoietic cell activity as well as on the presence of iron. Iron uptake is regulated by some of the members of the transferrin family of iron-containing proteins – transferrin and its receptors which assigns them a key regulatory role in hematopoiesis. Transferrins are expressed mainly in the liver, but small amounts arise also in the bone marrow, pancreas, testes, brain, spleen and kidneys. Experimental data show three types of transferrin receptors – transferrin receptor 1 (TfR1), transferrin receptor 2 (TfR2) and soluble transferrin receptor (sTfR). The expression of TfR1 and TfR2 is tissue- and cell cycle specific and is regulated by different control mechanisms, suggesting that they have different roles in iron metabolism. Cell surface TfR expression and concentration reflect iron requirements of the cells and they may be a useful marker for quantitative evaluation of the erythroid lineage, erythropoiesis and iron deficiency.

Key words: transferrin, transferrin receptor 1 (TfR1), transferrin receptor 2 (TfR2), soluble transferrin receptor (sTfR).