

Regulation of Fe absorption by cultured intestinal epithelia (Caco-2) cell monolayers with varied Fe status

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Body Fe homeostasis is maintained through the regulation of Fe absorption by the intestinal epithelia. Working under the hypothesis that the intracellular concentration of Fe is instrumental in the control of its transepithelial flux, we investigated in vitro which steps in Fe absorption are regulated by cellular Fe content. For that study, Caco-2 cells containing different concentrations of intracellular ^{55}Fe were grown in porous filters, and the apical-to-cell-to-basolateral flux of ^{59}Fe was then determined. We found that 1) at low (up to 0.1 mM) intracellular Fe content the apical-to-basal Fe transport was primarily regulated by a decrease in apical Fe uptake (first stage of regulation), 2) at higher levels of intracellular Fe (0.1-1 mM) the transepithelial Fe flux was regulated by intracellular factors that sequester most of the Fe taken up at the apical surface (second stage of regulation), and 3) a fraction of the apical-to-basolateral Fe flux was not regulated by the intracellu