

# Iron, copper, and zinc transport: Inhibition of divalent metal transporter 1 (DMT1) and human copper transporter 1 (hCTR1) by shRNA

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Iron (Fe), copper (Cu), and zinc (Zn) fulfill various essential biological functions and are vital for all living organisms. They play important roles in oxygen transport, cell growth and differentiation, neurotransmitter synthesis, myelination, and synaptic transmission. Because of their role in many critical functions, they are commonly used in food fortification and supplementation strategies globally. To determine the involvement of divalent metal transporter 1 (DMT1) and human copper transporter 1 (hCTR1) on Fe, Cu, and Zn uptake, Caco-2 cells were transfected with four different shRNA plasmids to selectively inhibit DMT1 or hCTR1 transporter expression. Fe and Cu uptake and total Zn content measurements were performed in shRNA-DMT1 and shRNA-hCTR1 cells. Both shRNA-DMT1 and shRNA-hCTR1 cells had lower apical Fe uptake (a decrease of 51% and 41%, respectively), Cu uptake (a decrease of 25.8% and 38.5%, respectively), and Zn content (a decrease of 23.1% and 22.7%, respectively) com