
Abstract
When Na(2)51CrO(4) is added to blood the 51CrO(4)(2-) ions enter the erythrocytes readily, and nearly exclusively, and are reduced to 51Cr(III) ions. We have observed that a fraction of these ions becomes bound to the cell membrane in a concentration which seemingly depends on that of the dietary derived intracellular Cr(III) ions. Thus, when constant amounts of 51CrO(4)(2-) ions enter constant amounts of erythrocytes, the resulting 51Cr(III) ions become bound to the cell membrane in a concentration that varies inversely as the initial, intracellular concentration of Cr(III) ions which, in turn, depends directly on the adequacy of chromium nutrition. Therefore, we have determined an arbitrary set of conditions under which the concentration of 51Cr(III) ions bound to the erythrocyte membrane becomes an indicator of the adequacy of chromium nutrition. The application of this test to 25 Type 2 diabetes mellitus subjects and 35 normal controls, both randomly selected, indicates that the concentrations of membrane bound 51Cr(III) ions in the two groups were not significantly different. Consequently, it is concluded that the level of chromium nutrition which is normally adequate in humans has only a minor role, if any, in the genesis of Type 2 diabetes mellitus.