

Mobilization of iron from endocytic vesicles. The effects of acidification and reduction

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The factors necessary to dissociate iron from transferrin in endocytic vesicles and to mobilize the iron across the vesicle membrane were studied in a preparation of endocytic vesicles markedly enriched in transferrin-transferrin receptor complexes isolated from rabbit reticulocytes. Vesicles were prepared with essentially fully saturated transferrin by incubating the reticulocytes with the protonophore carbonyl cyanide 4-(trifluoromethoxy)phenylhydrazone prior to incubation with ^{59}Fe , ^{125}I -transferrin with or without fluorescein isothiocyanate labeling. Initiation of acidification by the addition of ATP was sufficient to achieve dissociation of ^{59}Fe from transferrin with a rate constant of $0.054 \pm 0.06 \text{ s}^{-1}$. Mobilization of ^{59}Fe out of the vesicles required, besides ATP, the addition of a reductant with 1 mM ascorbate, allowing ~60% mobilization at 10 min with a rate constant of $0.0038 \pm 0.0006 \text{ s}^{-1}$. An NADH:ferricyanide reductase activity could be demonstrated in the vesicles with an ac