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JOURNAL ARTICLE

Receptor-mediated endocytosis of alpha 2-macroglobulin by principal cells in the proximal caput epididymidis in vivo

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Micropuncture techniques were used to study receptor-mediated endocytosis of alpha 2-macroglobulin bound to colloidal gold (alpha 2M-gold) by principal cells in the proximal caput epididymidis of control and efferent duct-ligated rats. The pathway of receptor-mediated endocytosis of alpha 2-macroglobulin-gold in vivo was similar to that which occurs in vitro. Alpha 2-macroglobulin-gold was taken up and internalized in coated pits and coated vesicles and was localized sequentially in uncoated vesicles (endosomes), tubular-vesicular structures, multivesicular bodies, and lysosomes. However, a 100-fold excess of alpha 2-macroglobulin did not displace the uptake of alpha 2-macroglobulin-gold in principal cells from control rats. In contrast, uptake of alpha 2-macroglobulin-gold by principal cells from efferent duct-ligated rats was six-fold greater than in control rats, and could be displaced to control levels by a 100-fold excess of alpha 2-macroglobulin. It is suggested that the inability of a 100-fold excess of alpha 2-macroglobulin to displace uptake of alpha 2-macroglobulin-gold in control rats was due to the normal saturation of apparent alpha 2-macroglobulin receptors on principal cells. The effect of efferent duct ligation was to remove the high levels of endogenous alpha 2-macroglobulin, which depleted the receptors of alpha 2-macroglobulin, thereby allowing a higher uptake of alpha 2-macroglobulin-gold in the efferent duct-ligated rats.