

The relation between insulin concentration and receptor number: 1. Increased insulin concentration decreases receptor number (down-regulation) and also decreases responsiveness to insulin i.e. resistance. 2. Decreased insulin concentration increases receptor number (up-regulation) and also increases responsiveness to insulin. 3. In obese (NIDDM) patients: Overeating-hyperglycemia increases insulin secretion decreases number of insulin receptors insulin resistance. Reduction of food intake diminishes hyperglycemia secretion increases receptors number and sensitivity. reduces insulin

Pharmacological actions of insulin: 1. Rapid transport effects: Receptor stimulation sends signals to increase glucose transporter 4 vesicles on cell membrane to increase glucose uptake by the cells Insulin enhances cellular uptake of K. Ca & phosphate leading to decrease in their plasma levels. 2. Gradual (delayed) effects: A- Carbohydrates: Insulin decreases blood glucose level through: Increase cellular uptake and utilization of glucose. Increase glycogen storage in the liver by enhancement of glycogenesis and inhibition of glycogenolysis. Inhibition of gluconeogenesis. B- Protein (anabolic): Insulin increases cellular uptake of amino acids by skeletal muscles for synthesis of protein