

Abstract

Hexamerins are multifunctional insect storage proteins utilized during metamorphosis of holometabolous insects. These proteins are stage specifically taken up by the fat body cells from the haemolymph due to receptor-mediated endocytosis. The hexamerin receptor and the concomitant hexamerin sequestration in the rice moth *Corcyra cephalonica* is controlled by the steroid hormone 20-hydroxy-ecdysone (20E). However, the mechanism of receptor activation for hexamerin uptake is not yet clear. We report here that 20E stimulates the phosphorylation of 120 kDa hexamerin binding protein which has been demonstrated to represent the receptor. Phosphorylation of the receptor is suggested to be essential for receptor activation and occurs prior to the hexamerin uptake. The 20E stimulated phosphorylation is mediated partly by a tyrosine kinase as phosphotyrosine antibodies cross-react with the receptor and its phosphorylation is blocked partly by genistein. Back phosphorylation study provides additional evidence for 20E regulation of hexamerin receptor phosphorylation in intact fat body. The receptor phosphorylation is developmentally regulated. This is the first report demonstrating that (i) the uptake of hexamerin is dependent on the phosphorylation of hexamerin receptor and (ii) the phosphorylation is catalyzed partly by a tyrosine kinase which is activated by 20E through a non-genomic action.