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(54) **Title:** DIETARY SUPPLEMENT FOR ENHANCING SKELETAL MUSCLE MASS, DECREASING MUSCLE PROTEIN DEGRADATION, DOWNREGULATION OF MUSCLE CATABOLISM PATHWAYS, AND DECREASING CATABOLISM OF MUSCLE CELLS

(57) **Abstract:** A dietary supplement and method for enhancing skeletal muscle mass, decreasing muscle protein degradation, downregulation of muscle catabolism pathways, and decreasing catabolism of muscle cells an individual, the supplement comprising at least source of Creatine or derivatives thereof, a source of Gypenosides or Phanoside or derivatives thereof, Creatinol-O- phosphate, and a source of Epigallocatechin Gallate or derivatives thereof. The dietary supplement may further comprise N-acetyl cysteine, astaxanthin, a protein or a carbohydrate. A method of enhancing GLUT4 translocation to the plasma membrane in non-adipose cells, decreasing muscle protein degradation, downregulation of the ATP-dependent ubiquination pathway of muscle catabolism, and decreasing catabolism of muscle cells through reducing the activation of NF-κβ is also provided.