[0004] Skeletal muscle tissue responds to anabolic stimuli, i.e., dietary protein intake and physical activity, for protein synthesis. Nevertheless, for subjects encountering injury, illness, and/or aging, implementation of sufficient physical activity for protein synthesis to maintain or increase muscle mass is not always possible. Therefore, it would be desirable to develop nutritional intervention strategies to resist or reduce the loss of muscle mass and strength and/or to promote muscle regeneration.

SUMMARY

[0005] The present invention is directed to methods of decreasing muscle atrophy and/or promoting muscle regeneration in a subject at risk of muscle atrophy. It is an object of the invention to provide such methods suitable for, among others, subjects for whom implementation of physical activity intervention sufficient for protein synthesis to maintain or increase muscle mass is not convenient and/or possible.

[0005a] In one aspect, the invention is directed to the use of a nutritional composition in the manufacture of a medicament for the treatment of muscle atrophy and/or the promotion of muscle regeneration in a subject at risk of muscle atrophy, wherein the nutritional composition comprises at least one of protein, fat and carbohydrate, and bovine milk-isolated exosomes comprising intact exosomes.

[0006] In one embodiment, the invention is directed to methods of decreasing muscle atrophy and/or promoting muscle regeneration in a subject at risk of muscle atrophy. The methods comprise orally administering a nutritional composition comprising at least one of protein, fat and carbohydrate, and bovine milk-isolated exosomes comprising intact exosomes.

[0007] The methods of the invention are advantageous in providing a convenient manner to reduce muscle atrophy and/or promote muscle regeneration in a subject at risk of muscle atrophy. The methods may be conducted on a continual basis over a period of time as needed depending on the risk of the subject to muscle atrophy. These and additional advantages of the inventive methods will be more fully apparent in view of the detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Certain aspects of the invention are illustrated in the drawings, in which:

[0009] Fig. 1 shows that protein degradation by dexamethasone (C) and in the presence of intact bovine milk-isolated exosomes (Ex) as described in Example 2;

[0010] Fig. 2 shows Akt phosphorylation of myotubes incubated alone (C) and with bovine milk-isolated exosomes as described in Example 2;