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(54) Title: A COMPOSITION AND METHOD TO ALTER LEAN BODY MASS AND BONE PROPERTIES IN A SUBJECT

(57) Abstract: The present invention pertains to a method for decreasing the body fat proportion, increasing lean body mass ("LBM"), increasing bone density, or improving the rate of bone healing, or all, of a subject. Overall, the embodiments of the invention can be accomplished by delivering a heterologous nucleic acid sequence encoding GHRH or functional biological equivalent thereof into the cells of the subject and allowing expression of the encoded gene to occur while the modified cells are within the subject. For instance, when such a nucleic acid sequence is delivered into the specific cells of the subject tissue specific constitutive expression is achieved. Furthermore, external regulation of the GHRH or functional biological equivalent thereof gene can be accomplished by utilizing inducible promoters that are regulated by molecular switch molecules, which are given to the subject. The preferred method to deliver the constitutive or inducible nucleic acid encoding sequences of GHRH or the functional biological equivalents thereof is directly into the cells of the subject by the process of *in vivo* electroporation. A decrease the body fat proportion and an increase in lean body mass ("LBM"), or both of a subject is achieved by the delivery of GHRH or functional biological equivalent thereof as described herein by into the subject as recombinant proteins. In addition, an increase in bone density and improvement in the rate of bone healing is also achieved.