Does vitamin D status contribute to caveolin-1-mediated insulin sensitivity in skeletal muscle?

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To the Editor: As originally postulated by Harold Himsworth [1], a reduction in insulin sensitivity in muscle is associated with an increased risk of human type 2 diabetes. Thus, the finding that downregulation of caveolin-1 production leads to a reduction in insulin resistance, which is improved by upregulation of production of this protein as described by Oh et al. [2], is of considerable interest. Appropriate modulation of caveolin-1 production might be expected to be of benefit for reduction of the risk of type 2 diabetes in humans.

Hypovitaminosis D has been shown to be associated 'dose-wise' with lower insulin sensitivity in humans in cross-sectional studies [3, 4]; it is also associated with an increased risk of type 2 diabetes both cross-sectionally and prospectively in humans [5–7]. Caveolin-1 protein is necessary for the rapid non-genomic actions of activated vitamin D [8]. Adequate vitamin D repletion may contribute, therefore, to the maintenance of insulin sensitivity in humans through caveolin-1 modulation. This possibility is supported by the finding of marked insulin resistance and vitamin D resistance in humans with Berardinelli–Seip congenital lipodystrophy, who have a homozygous nonsense caveolin-1 mutation [9]. It would, therefore, be of great interest to know whether activated vitamin D improves insulin sensitivity in the JYD mouse (an ageing-dependent non-obese animal model of type 2 diabetes) of

Oh et al. [2] and, if so, whether this might be caused by upregulation of caveolin-1 production.

Duality of interest The author states that there is no duality of interest associated with this manuscript.

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