

## Do redox-regulated microRNAs play a role in age-related muscle wasting?

Katarzyna Goljanek-Whysall<sup>1,2</sup>

<sup>1</sup>University of Liverpool, UK

<sup>2</sup>National University of Ireland, Ireland

**T**here is currently a disproportionate increase in age-related health issues, with one of the major problems being the age-related loss of muscle mass and function-sarcopenia. Redox and epigenetic factors are key regulatory pathways associated with ageing. MicroRNAs, stable RNAs with half-life>24h, regulate muscle homeostasis post-transcriptionally. Oxidative modification of microRNAs could result in the regulation of non-native targets. Redox balance is disrupted during ageing and the accumulation of oxidised, most likely pathogenic, microRNAs in muscle leads to their disrupted specificity for regulating protein content. We have validated microRNAs/mRNAs/proteins networks affected by ageing in muscle and have shown that modifying microRNA expression improves muscle

function, but there is currently no research into the function of oxidised microRNAs in ageing. Integrating epigenetic/redox experimental approaches with functional studies, we have studied key oxidised microRNAs and targets in human and mouse muscle and have shown that inhibiting one of the oxidised microRNAs in old mice positively affects myofibre size and muscle strength. We have shown that improvement of muscle force following inhibition of oxi-microRNA is associated with changes in mitochondrial dynamics and has no overall off-target effects. This provides proof-of-principle for the use of specific oxi-microRNA inhibitors for improvement of muscle function during ageing.

k.whysall@liverpool.ac.uk