411

DOES REPEATED BREATH-HOLD EXERCISE RESULT IN ACCELERATED MUSCLE AGING? AN INVESTIGATION OF A MODEL SPECIES, THE WEDDELL SEAL (*LEPTONYCHOTES WEDDELLI*)

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The primary aim of this study is to investigate diving seals as a novel model for the study of the physiology of aging. Exposure to hypoxia and reoxygenation during breath-hold diving and hunting is theoretically accompanied by surges in the generation of oxygen free radicals, which are implicated in age-related damage to cellular mitochondria. The apparent lack of senescence in pinnipeds when reasoning suggests them as excellent candidates for aging is remarkable. We identified the well-studied Weddell seal as a model to examine two aspects of this phenomenon. First, we examine what specific physiological and morphological changes occur with advancing age in pinnipeds. Second, we investigate what, if any, physiological and behavioural adjustments are made to cope with such changes. Preliminary data illustrate morphological and biochemical changes in *longissimus* and *pectoralis* muscle from peak and late-stage reproductive Weddell seals. Comparisons are based on muscle fibre cross-sectional area, myocyte density, cellular oxidative status, and cellular protective mechanisms. We hypothesize that senescence does occur at the level of small-scale, proximate physiological effects. However, we anticipate that behavioural plasticity provides sufficient compensation to prevent obvious senescence defined through animal performance and reproductive output.