

ABSTRACT FOR THE GENERAL PUBLIC

Environmental stressors can seriously jeopardize animals' ability to survive and reproduce. One, potentially dangerous, environmental stressor is acute cold. To counteract cold, affected organisms mount various types of responses, ranging from cold avoidance to adaptation. The latter strategy is used by hibernating animals, which, in extreme cases, can survive subzero temperatures for many days. Here, we propose to utilize a simple animal model, the nematode *Caenorhabditis elegans*, as a rapid tool to understand cellular adaptations to cold. We will focus on mechanisms altering the abundance and types of cellular messenger RNAs and proteins, as these kinds of molecules are critical for the live-or-die decision of the cell. In some disease states, like stroke, cooling can facilitate patient's recovery. Moreover, hibernation is of interest to ageing research, as animals tend to live longer at lower temperatures. Thus, understanding how cells adapt to cold has the potential to influence treatments of human disorders.