All animal care and use were performed following the institutional protocol #AIMCB-404 that was approved by the University of Tokyo. Specimens of horse mackerel (*Trachurus japonicus*) were reared in a 1 m3 tank. The tank was connected to a recirculation system and the seawater temperature was kept at around 20°C. After 2 days of starvation, 12 fish were collected from the water, divided into 4 groups, and slaughtered under the following conditions: three individuals were decapitated immediately after being taken out of the water (Decap)., and three individuals were exposed to air for 1, 5, or 10 min (referred to as AirEx1, AirEx5, and AirEx10, respectively). The tissue specimens were dissected from dorsal skeletal muscle and flash frozen in liquid nitrogen.