









sitive to environmental alterations. It is likely that the structural preservation of the sarcomeric arrangement is related also to mechanoreceptor stimulation<sup>12,13</sup> which was obviously lost in the bioreactor too.

Previously reported culture methods of isolated skeletal muscles were based on the incubation in a shaking water bath at 35°C with O<sub>2</sub>/CO<sub>2</sub> insufflation: the muscles were maintained under such conditions until 18 h and then submitted to biochemical analysis.<sup>3,14-17</sup> The bioreactor used for the present study seems to be more efficient as it may be directly placed inside the incubator, thus allowing to maintain steady levels of temperature, humidity, O<sub>2</sub> and CO<sub>2</sub>, which are essential factors to improve cell survival under *in vitro* conditions. In addition, this fluid dynamic system may ensure a culture environment more similar to the physiological one than other previously proposed incubation methods: in our experiment, the flow rate in the bioreactor was set at 300 µL/min, to reproduce the blood flow values in skeletal muscle,<sup>18</sup> but the fluid flow may be finely modulated, to mimic metabolic changes for functional studies. We cannot exclude that an increase in the flow rate could further ameliorate muscle preservation by improving metabolite/ catabolite turnover. A concomitant temperature decrease of a few degrees would possibly prolong the *in vitro* preservation, but this would obviously make the tissue differently responsive to the experimental stimuli.

It is worth noting that the availability of reliable systems for organ preservation and culture will have a positive ethical and economic impact on research activities allowing to effectively reduce the experimentation on animals. Prolonging the preservation of explanted organs under *in vitro* conditions expands their potential as experimental systems suitable for basic research as well as for efficacy/safety tests on chemicals, pharmaceuticals, nanocomposites and food/feed components.

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