Response

Dear Editor-in-Chief:

We recently reported that six training sessions of repeated sprints, performed either in normoxia (RSN) or hypoxia (RSH), provide similar and meaningful benefits to the performance of competitive cross-country skiers in terms of double-poling sprints (4). In addition, RSH delayed fatigue (defined as the inability to maintain the peak power above a certain threshold) during a repeated-sprints ability test. First, well aware of the primary importance of controlling pacing during repeated sprints tests (5), we determined precisely the highest power reached in two isolated sprints preceding the test. Subjects were thus requested to reach 95% of this peak power in the first (or second if needed) sprint of their repeated-sprints ability test. Secondly, we set a task failure criterion (e.g., 70% of this best sprint) in accordance with our previous RSH investigation in cycling (3).

Obviously, this criterion was applied individually and therefore cannot be used to estimate a virtual number of sprints from the mean values presented graphically in our work. Hence, an average peak power of at least 505 and 502 W (i.e., 95% of 532 W and 528 W, respectively) was actually reached by all subjects in both the RSN and RSH groups, respectively (see Table 3 in (4)).

Interestingly, the threshold of 525 W proposed *ex nihilo* by Montero and Lundby (7) yields a power output 5% above this threshold for RSH subjects in their 12th sprint, at which stage individuals in the RSN group failed. Moreover, the absolute improvement in peak power output (of 113 W after RSH and 95 W after RSN) reflects the individual setting of thresholds relative to absolute peak power, which does not make it easier to perform more sprints in RSA, as claimed by Montero and Lundby (7). By the way, this improvement indicates that our training intervention, be it in normoxia or hypoxia, may be beneficial to competitive cross-country skiers.

We agree that this training strategy yields only a very specific improvement in performance, with a surprising increase in the number of repeated sprints after RSH, but considerable variation can be expected when evaluating efforts to task failure (for example, see (1) with a 35% time-to-exhaustion improvement after hypoxic training).

In this connection, it is our opinion that more careful double-blinded, controlled studies such as ours are needed to confirm the potential of and mechanisms underlying RSH. Nonetheless, we can already safely encourage cross-country skiers to include occasional blocks of double-poling RSH to

their normal training regimen because this may improve their work capacity to a greater extent and at least not less than the same training in normoxia. Finally, our recent review of the literature emphasizes not only the strikingly poor additional benefits of hypoxic training for general performance but also the growing interest in RSH for improvement of specific performance (2), which challenges traditional training strategies (6).

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