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### Title

Evidence for a threshold relationship between lactate efflux and intracellular PO<sub>2</sub>

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# letters to the editor

## *Evidence for a threshold relationship between lactate efflux and intracellular PO<sub>2</sub>*

*To the Editor:* Recently, Connett, Gayeski, and Honig (2) presented the results of a study entitled "Lactate efflux is unrelated to intracellular PO<sub>2</sub> in a working red muscle in situ." Since the major thrust of their paper was a challenge to the concept that lactate accumulation is related to O<sub>2</sub> availability in mammalian cells, I was surprised that the authors did not plot the crucial relationship of lactate efflux as a function of muscle PO<sub>2</sub>. I performed this analysis from their data using the median values for intramuscular PO<sub>2</sub> (their Fig. 2B) and lactate efflux (their Fig. 2A). The resulting plot is shown on the right.

In striking contrast to the title and conclusions of the paper, their data demonstrate a threshold relationship between lactate efflux and intracellular PO<sub>2</sub> occurring at ~8 Torr. Moreover, this is remarkably similar to the work of Bylund-Fellenius et al. who demonstrated a threshold phenomenon for the intramuscular lactate-to-pyruvate ratio as a function of intramuscular PO<sub>2</sub> in exercising human subjects (1). I believe that the data presented by Connett and co-workers (2) are consistent with the existence of a threshold of lactate efflux from cells which is related to PO<sub>2</sub>; their data, therefore, support the concept of the anaerobic threshold. Finally, the critical PO<sub>2</sub> below which O<sub>2</sub>-dependent processes cease is a function of the mitochondrial PO<sub>2</sub> (not measured in the article) and not solely dependent on the cytosolic PO<sub>2</sub>.

## REFERENCES

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2. CONNETT, R. J., T. E. J. GAYESKI, AND C. R. HONIG. Lactate efflux is unrelated to intrace intracellular PO<sub>2</sub> in a working red muscle in situ. *J. Appl. Physiol.* 61: 402-407, 1986.

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