



## 2020 IMPACT CIRCLE

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### **Bioenergetic power as biomarker**

Blood-based biomarkers of mitochondrial function carry the promise of assessing disease susceptibility, monitoring intervention and prognosing disease. However, until well-defined and standardizable technology is translated from basic research to the clinic, the broader applicability of bioenergetic fitness as a blood-based biomarker will remain remote.

Previously proposed blood-based cell respiratory biomarkers have multiple shortcomings in how data is interpreted or how assays are carried out. To address these, we defined a novel metric of mitochondrial function. This metric is **peak bioenergetic power**, which estimates mitochondrial fitness in cells in physiological-like conditions that maximize output of cellular energy production. We have developed an assay to determine the new metric in cells by the combination of cell respiration data and the electric potential across the mitochondrial inner membrane.

We hypothesize that peak bioenergetic power is a better metric of bioenergetic fitness than cell respiration parameters or bioenergetic health indices previously proposed as blood-based biomarkers, because they are more robust and have greater predictive power.