

## **Physiological acclimatization and phenotypic plasticity in indigenous populations of the Upper Rio Negro, Amazon, Brazil**

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Energy supply to the contractile proteins of muscle cells depends on the type of work performed: weight lifting or shot put need fast energy whereas in a marathon run energy must be provided over a long time. Upon training muscle fibers adjust their design to these different requirements by phenotypic plasticity on a basic template, e.g. by modifying fiber type composition and incorporating more mitochondria for endurance exercise to preferentially provide energy by oxidative phosphorylation. This requires commensurate adjustments in the structures of the  $O_2$  pathway to ensure  $O_2$  supply matched to the energy demands of the muscle cells. Phenotypic plasticity allows fine-tuning of structures according to functional needs and is therefore a fundamental property for economic design. Changes in energy metabolism of the individual may be an important component of this adaptive response. Indigenous populations of the Upper Rio Negro, Amazon, in Brazil, have been exposed to a myriad of parasites which compete with them for the energy resources available. Access to these populations has allowed us to know how they have been able to survive and still perform under such adverse circumstances; a case of phenotypic plasticity?