

# **HYPOXIA #2: THE HETEROPLASMY BIOMARKER: TRANSKETOLASE**

Thiamine, also known as vitamin B1, is now known to play a fundamental role in energy metabolism. When we are deficient in B1 the mitochondrial matrix suffers from pseudohypoxia.

Its discovery followed from the original early research on the 'anti-beriberi factor' found in rice polishings. After its synthesis in 1936, it led to many years of research to find its action in treating beriberi, a lethal scourge known for thousands of years, particularly in cultures dependent on rice as a staple.

Thiamine pyrophosphate (TPP) is the active co-enzyme form of thiamine and it is abundant in human RBC's. For this reason it is a reasonable marker that we can use in mitochondrial matrix failure associated with higher heteroplasmy states.

When we see abnormal peripheral smears in patients it signifies that we might want to clinically assess TPP activity and thiamine levels in our patients. Some disease states associated with high mitochondrial density show these clinical features more often than not because certain organs have higher mitochondrial capacity.



**BLOOD IS A  
HYDRODYNAMIC NON  
NEWTONIAN FLUID  
THAT CONNECTS THE  
SUN TO  
MITOCHONDRIA  
WIRELESSLY. THIS IS  
NATURE'S WIFI.**

**JACK KRUSE**

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