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Peak Aerobic Capacity and Dietary Composition are Associated with the Bioenergetic Profile of Platelets in Children

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Peak aerobic capacity and dietary composition are related to the bioenergetic profile of platelets in children

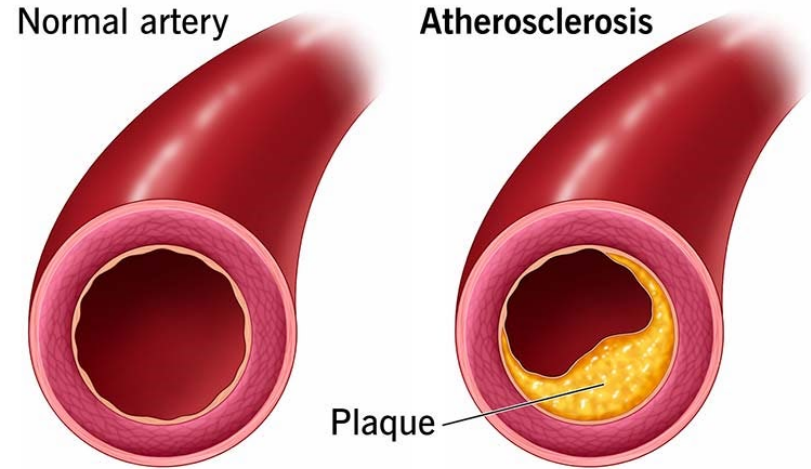
Duncan Troup, Mentor: Dr. Eva Diaz

Thesis Director: Dr Joshua Kwekel

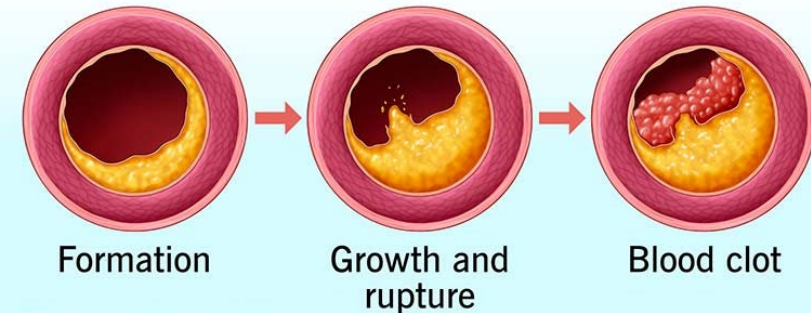


- Develops over several decades
- Foundational cause of 50% of deaths in western societies
- Can begin in the first decade of life

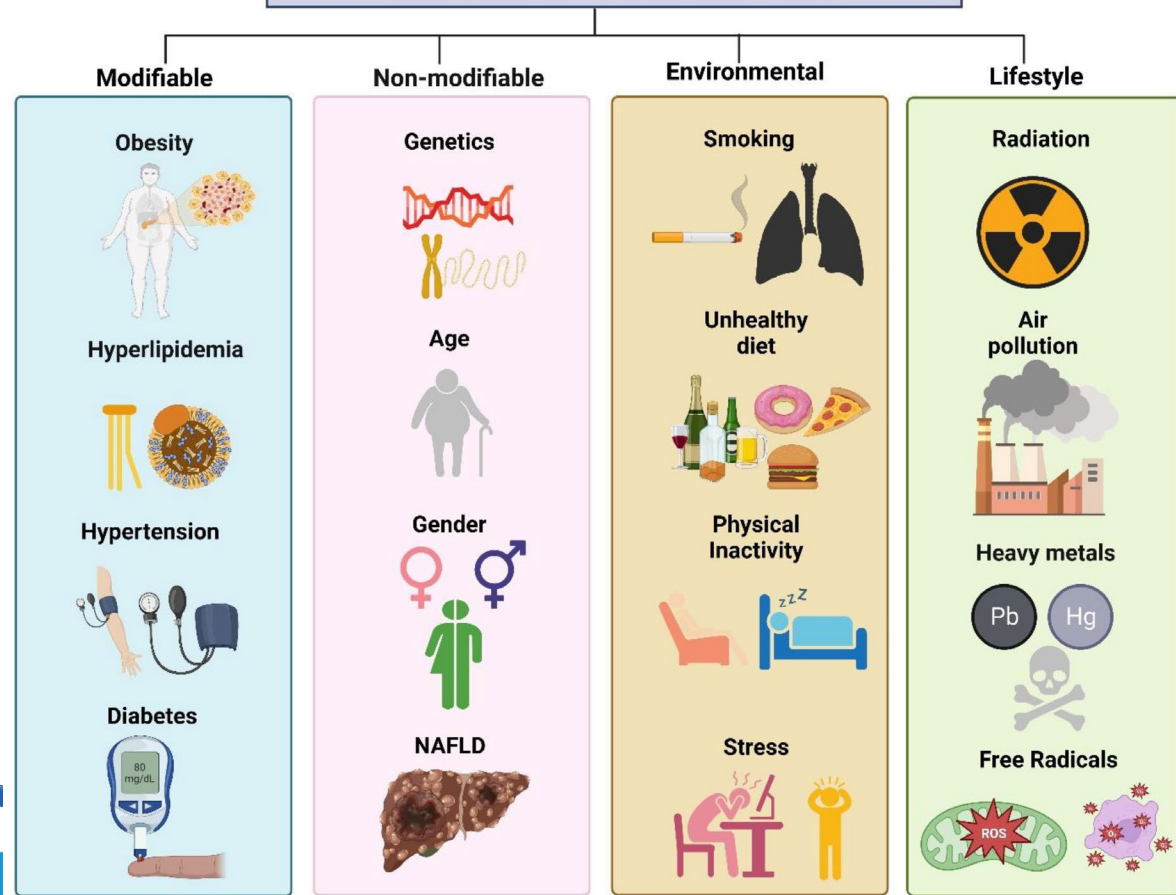
Atherosclerosis



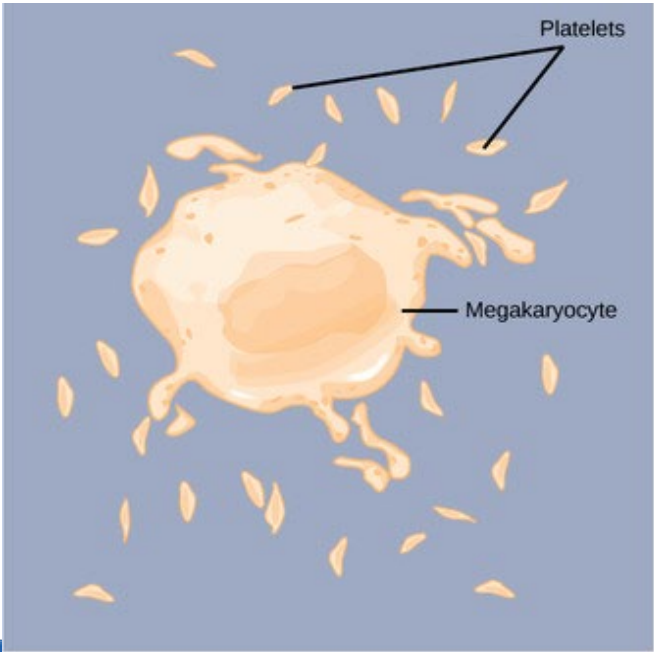
Progression



Risk Factors for Atherosclerosis

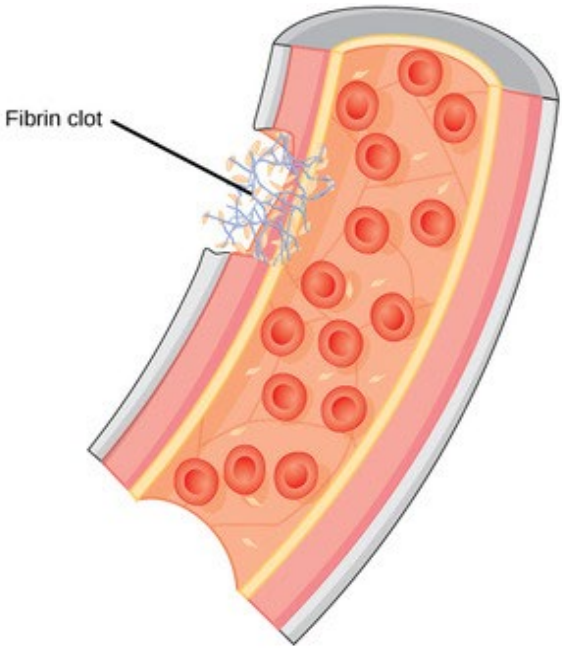


Platelets



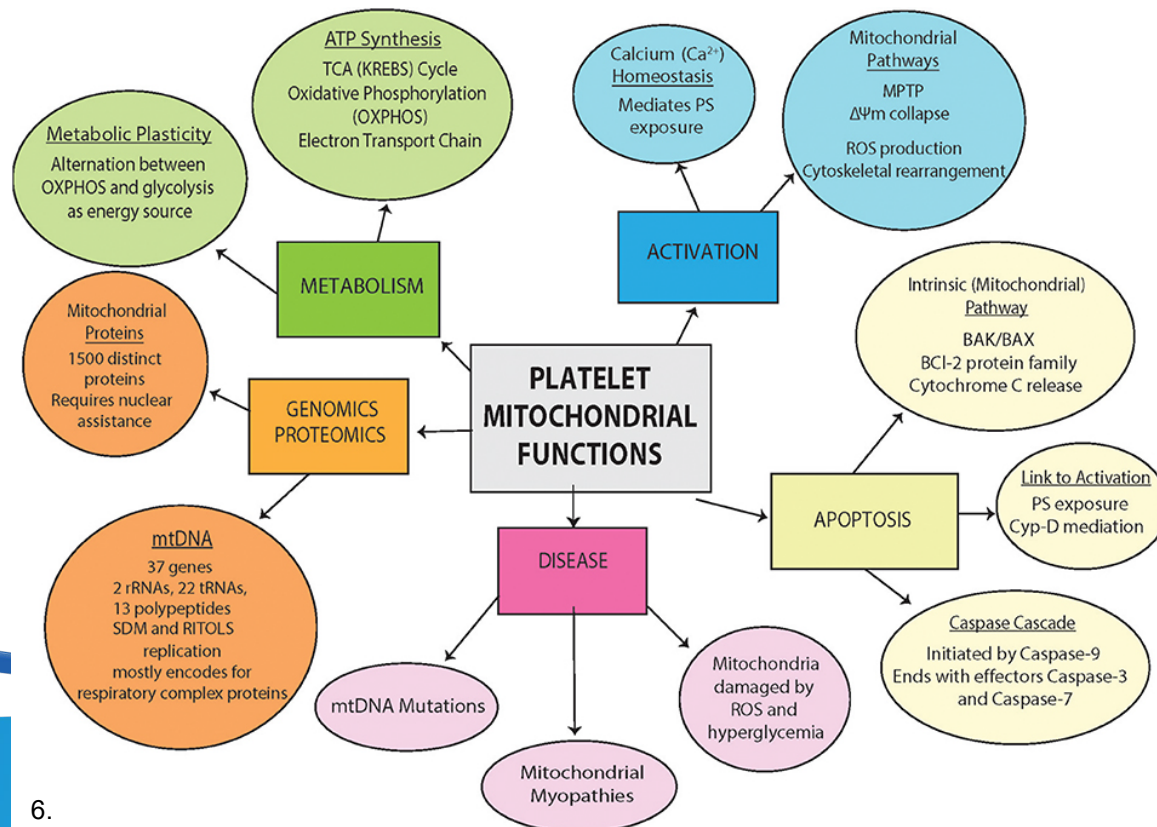
3.

(a)



(b)

Platelet Mitochondria



BMI, Diet, Fitness



**Mitochondrial
Dysfunction**



Platelet Dysfunction



Atherosclerosis

Research Purpose

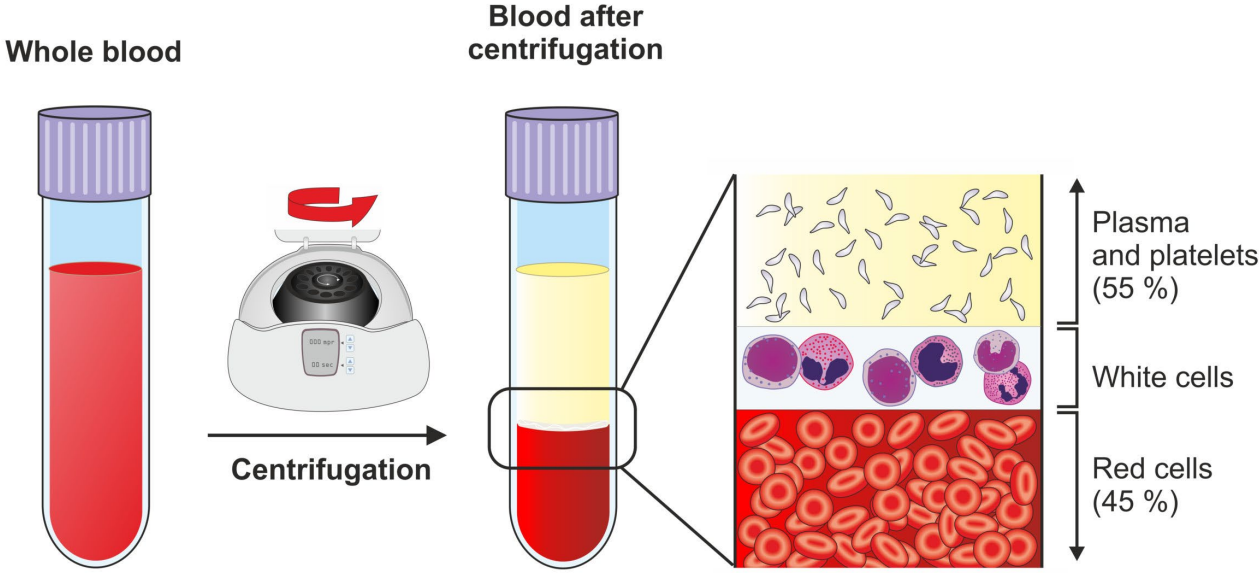
Methods

- Cross sectional observational study to investigate association between platelet mitochondrial function and atherosclerotic disease risk

Variables	n=87
Age (years)	9.52 ± 0.86
Sex, n (%)	
Girls	35 (40)
Boys	52 (60)
Race-ethnicity, n (%)	
Black	19 ± (22)
White	56 ± (64)
Other	12 ± (14)
Weight (kg)	39.92 ± 12.74
Height (cm)	140.07 ± 9.22
BMI percentile	75.37 ± 23.52
Weight status, n (%)	
Normal weight	45 (52)
Overweight	42 (48)
MVPA	54.68 ± 21.55
VO2 (mL/kg/min)	34.79 ± 7.52

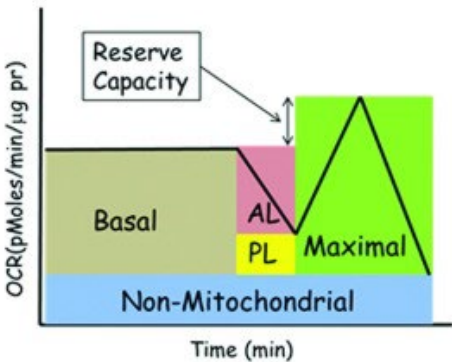
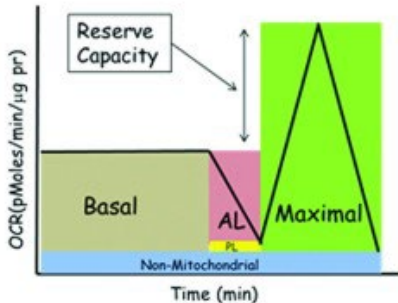
Data presented as mean±SD, counts and percentages.
BMI = body mass index, MVPA = moderate to vigorous physical activity, BHI = bioenergetic health index

Methods



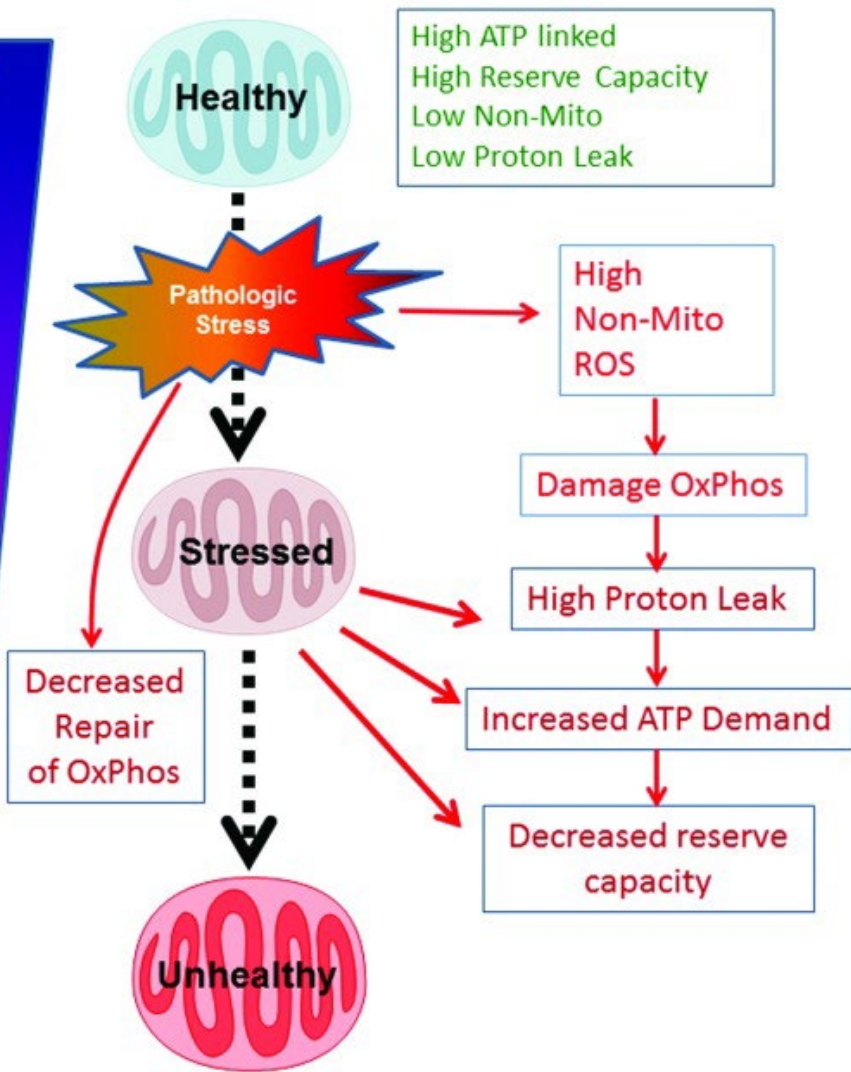
5.

Bioenergetic Health

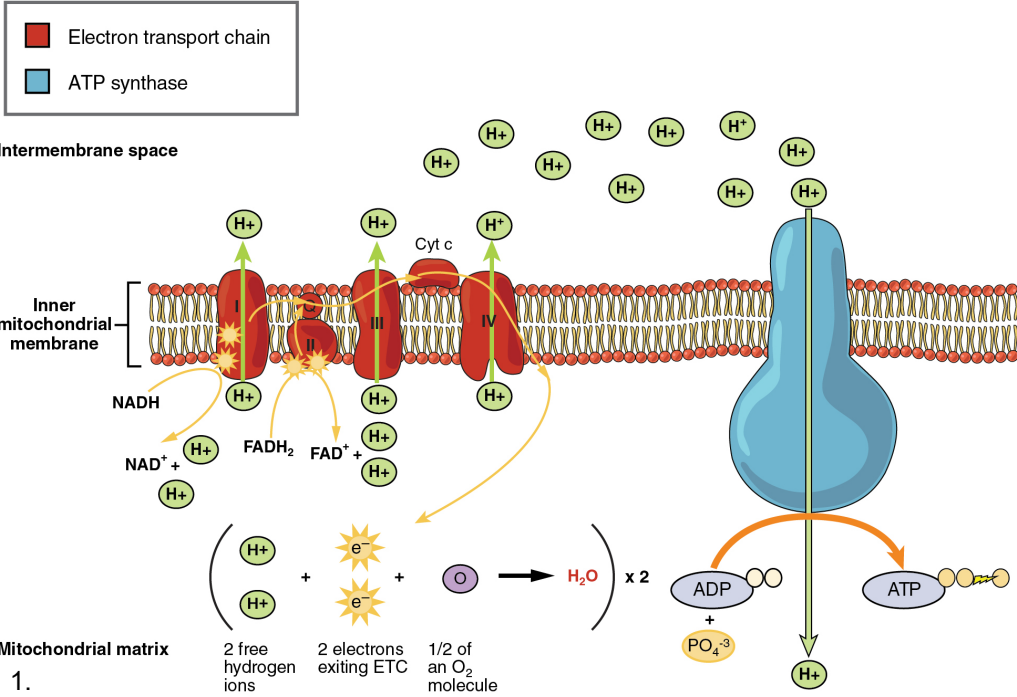


Bioenergetic Dysfunction

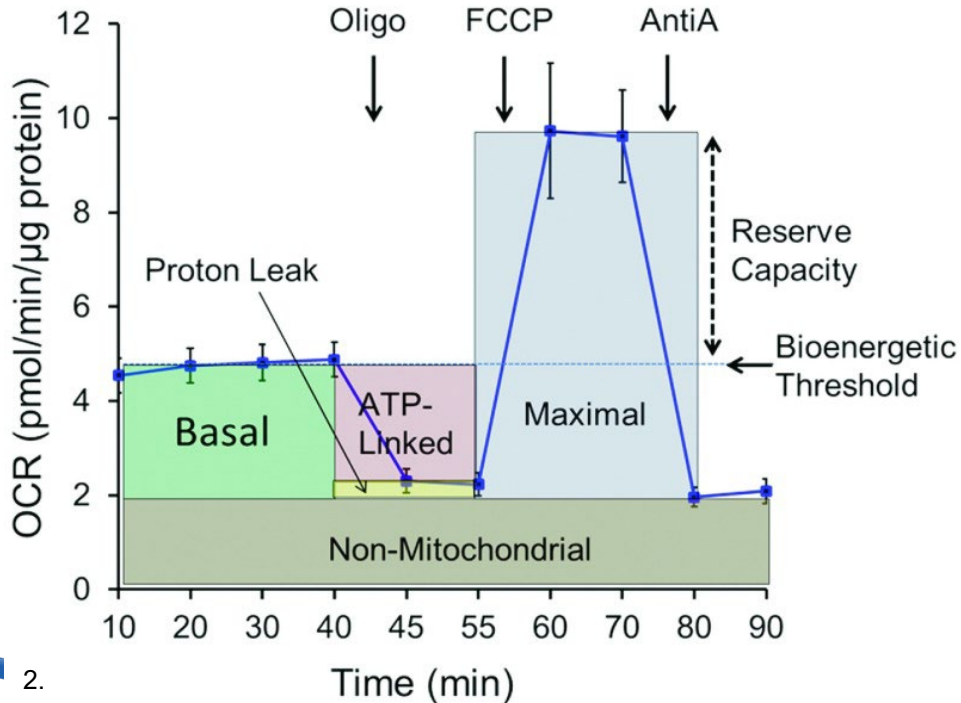
BHI



Methods

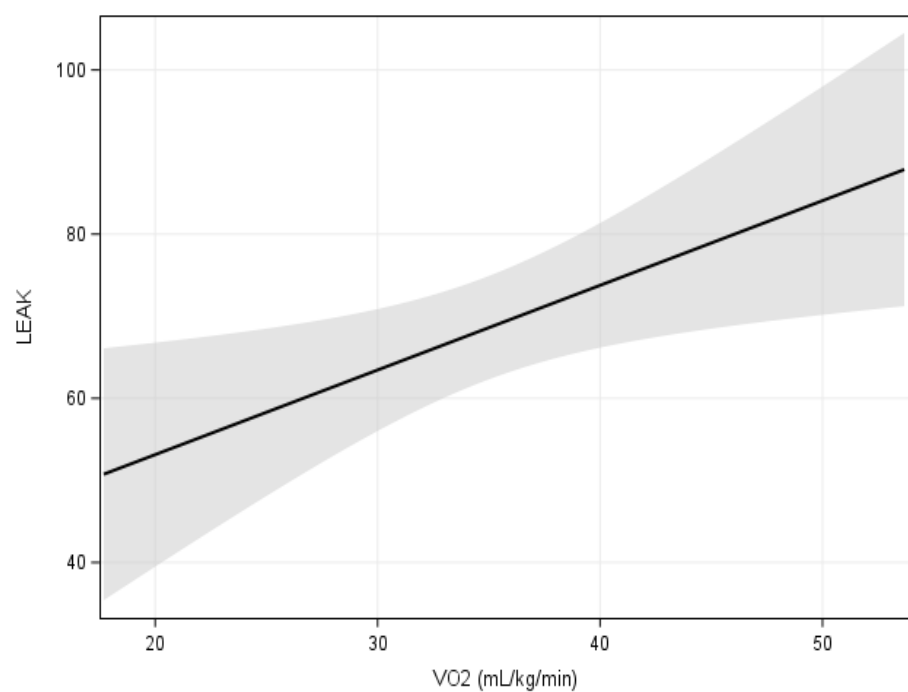
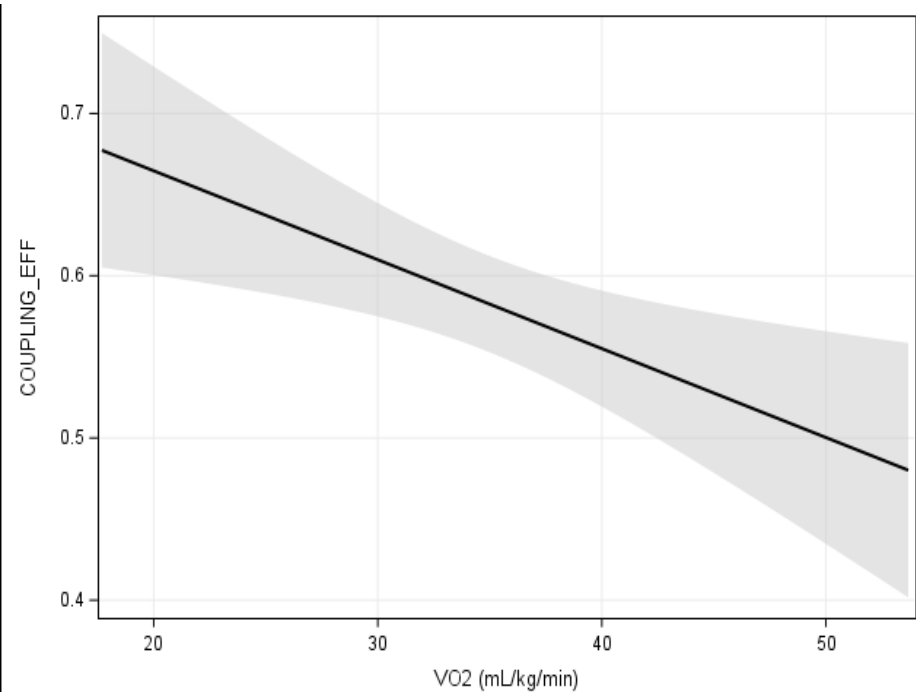


Methods

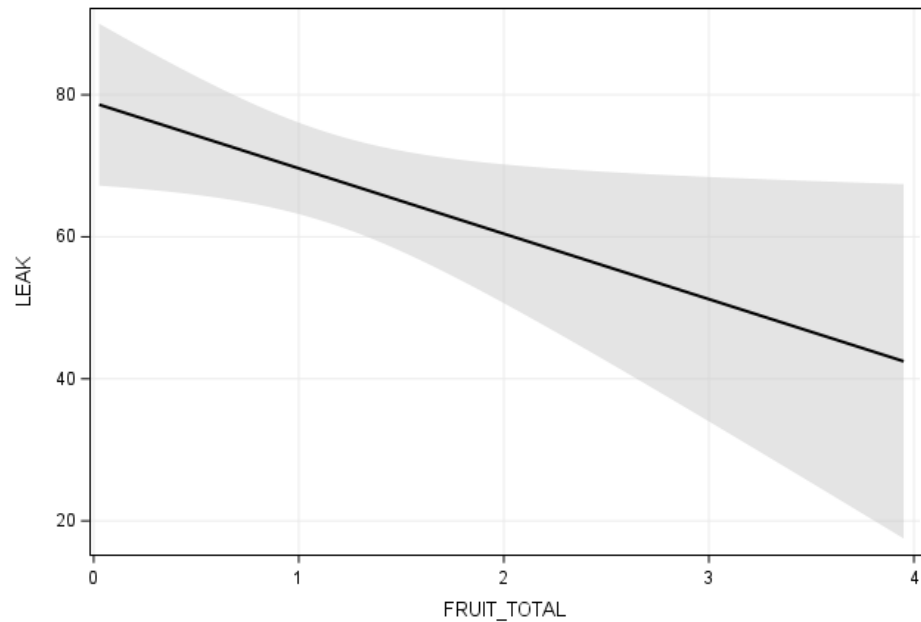
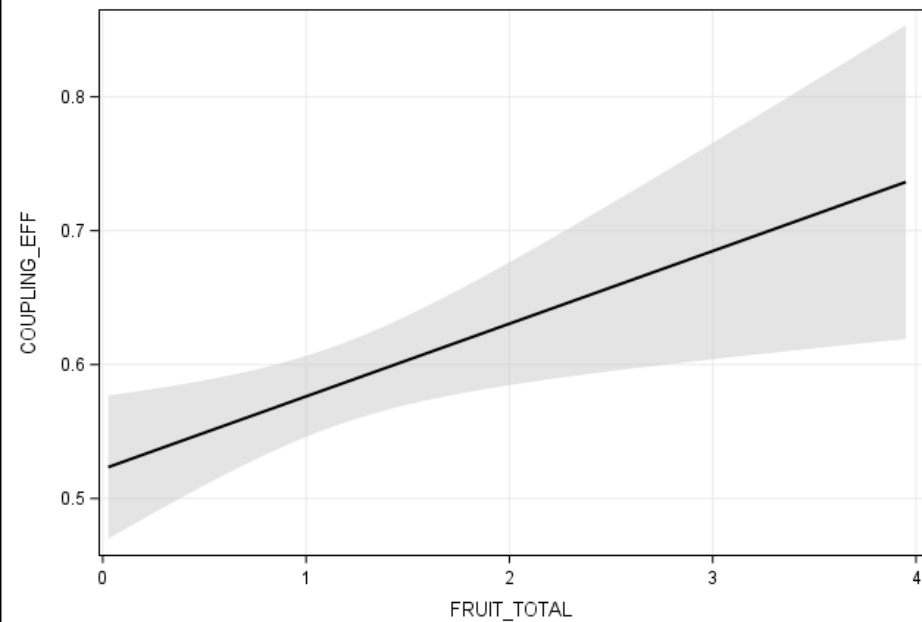


2.

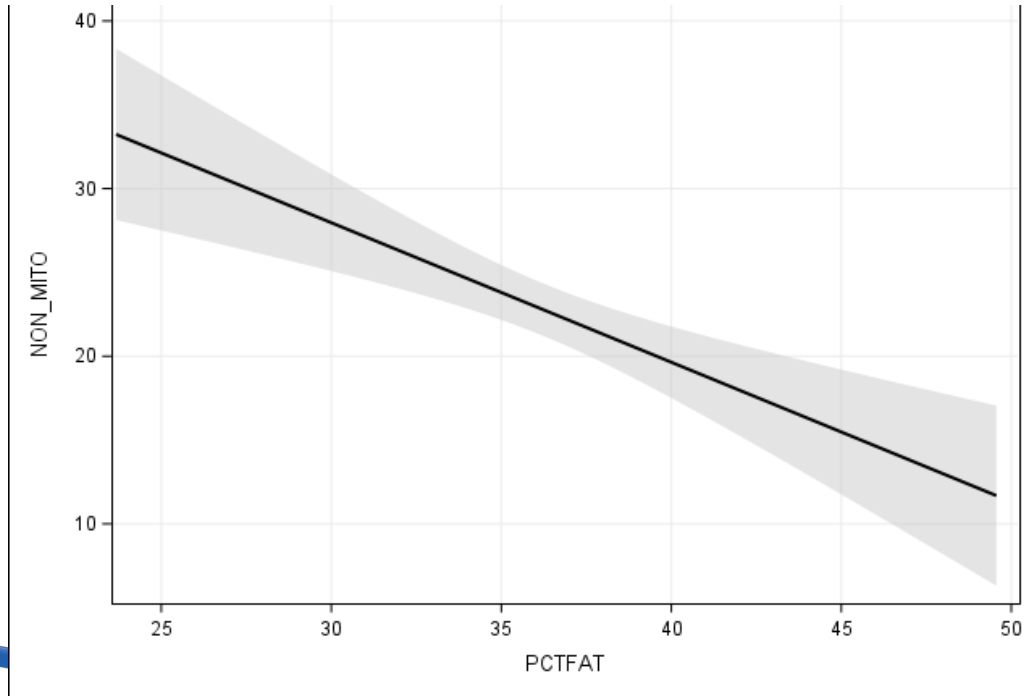
VO2



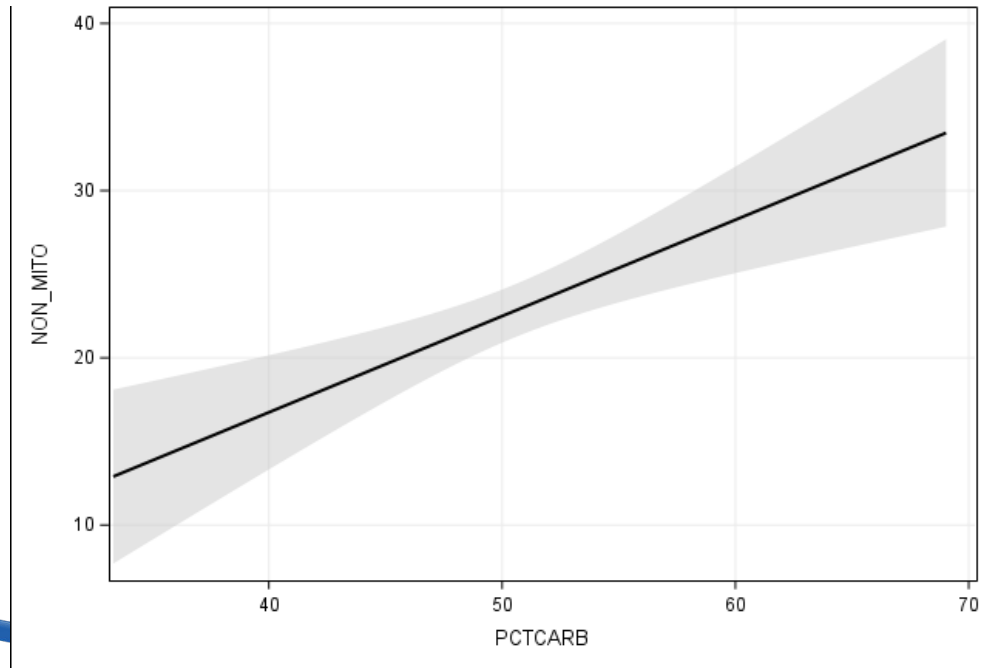
Fruit



Dietary Fat



Dietary Carbohydrates



BMI/MVPA

- BMI and MVPA did not correlate with platelet mitochondrial function

Conclusions

- Platelet mitochondrial function is associated with dietary composition and VO₂ max
- Whether these influence platelet activation will be determined in the ongoing MI-Energy Study



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Dr. Joshua Kwekel – Thesis Director

References

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