ACUTE ENDOTHELIAL AND ANGIOGENIC RESPONSE

TO RESTRICTED BLOOD FLOW EXERCISE WITH COOLING IN HEALTHY VOLUNTEERS – THE PILOT STUDY

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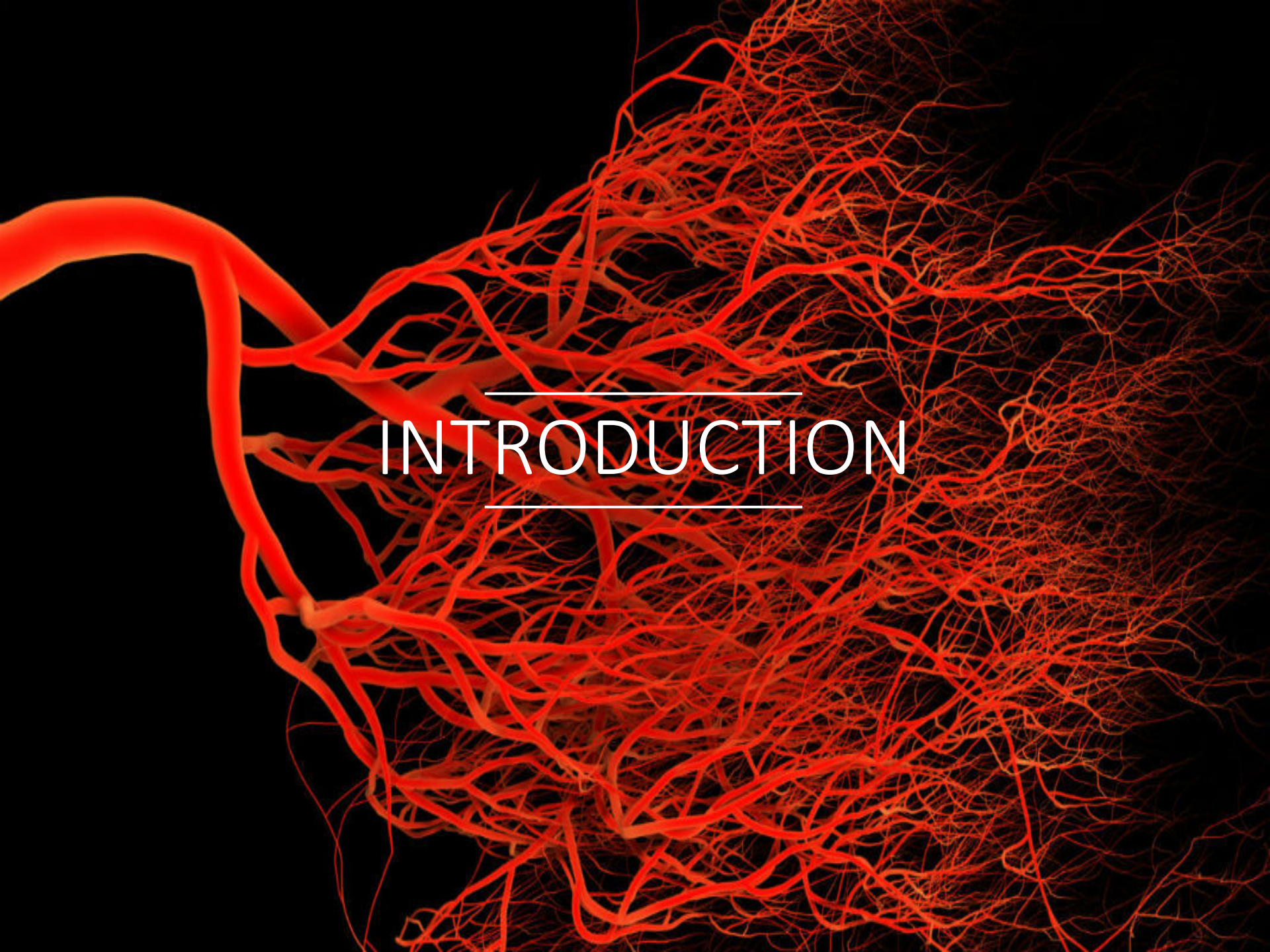
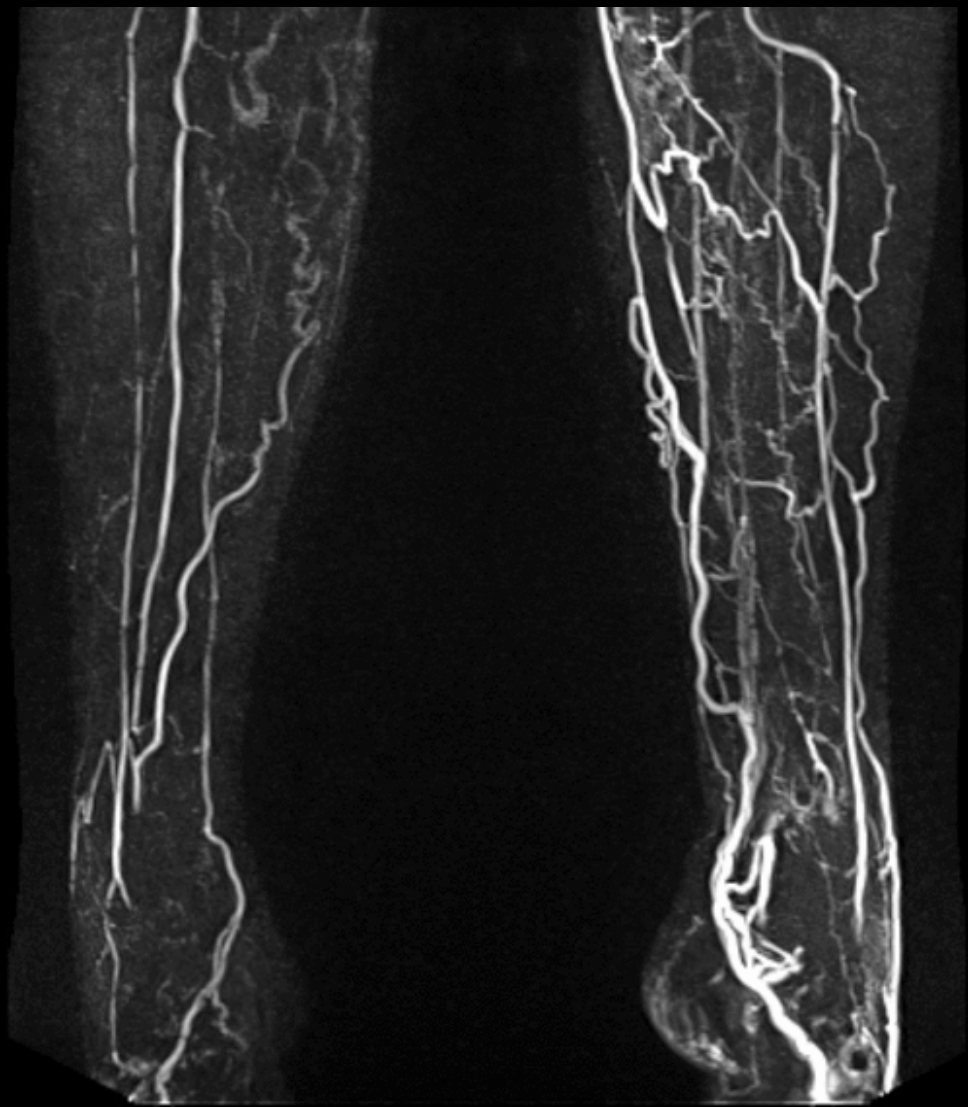
PS146, Parallel Oral Session, Physiology & Immunology

YES MEETING

YOUNG EUROPEAN SCIENTIST MEETING


INTRODUCTION

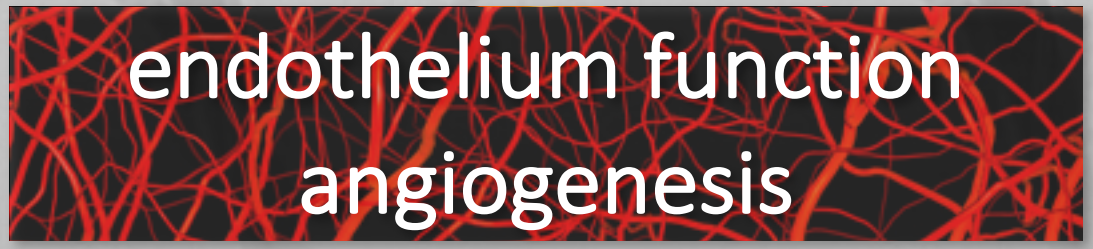
PERIPHERAL ARTERY OCCLUSIVE DISEASE – chronic inflammatory vascular disease



PERIPHERAL ARTERY OCCLUSIVE DISEASE – management

PHYSICAL TRAINING

+ vein occlusion
+ cooling



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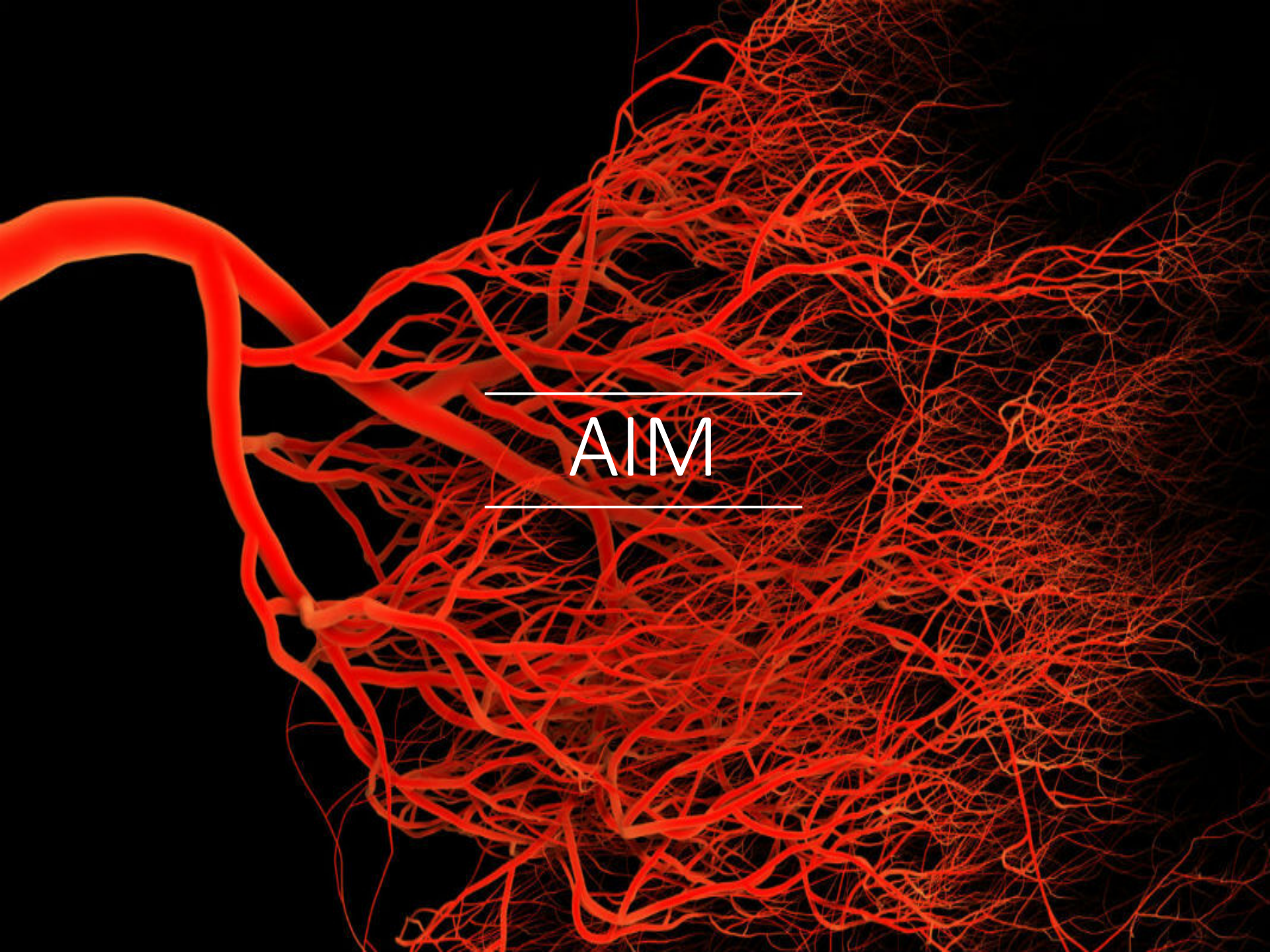

AIM


restricted blood flow exercise
with cooling
acute endothelial and angiogenic response
among healthy volunteers

MATERIAL AND METHODS

VASPER

INTERVAL TRAINING

COMPRESSION

NuStep T5XR PLATFORM

COOLING

35 healthy volunteers
24,8 ± 2,6 years old
51,4% males
height 174,7 ± 9,4 cm
weight 68,3 ± 13,6 kg

1ST DAY

imaging examinations

laboratory parameters

21-minutes interval training

3RD DAY

21-minutes interval training

20-30 min

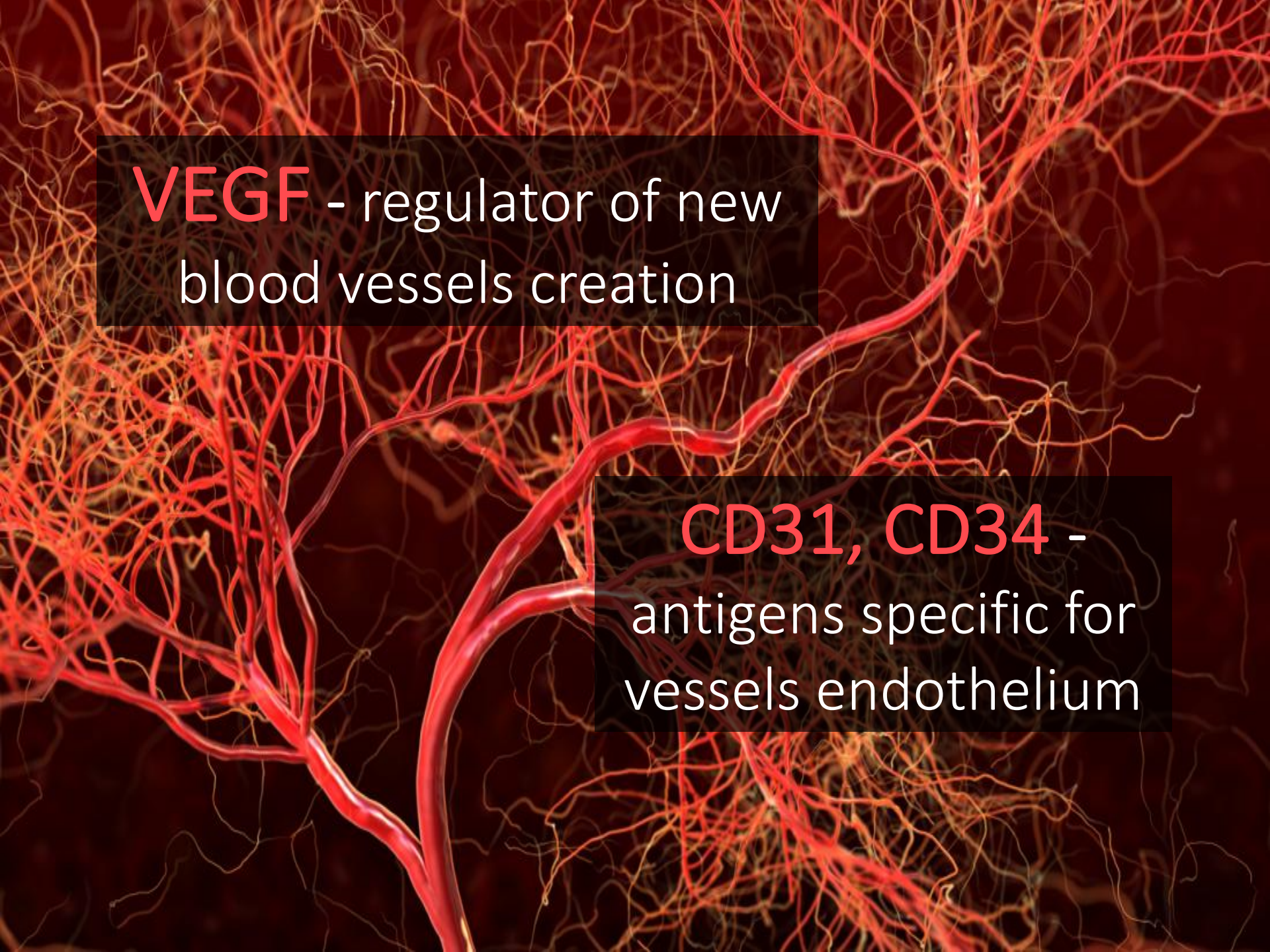
laboratory parameters

imaging examinations


NOTE: Vasper exercise is very efficient. It is recommended that
new users begin at the low intensity level to become
accustomed to the workout loads and to determine how their
body reacts.
Vasper Systems, LLC


T5XR

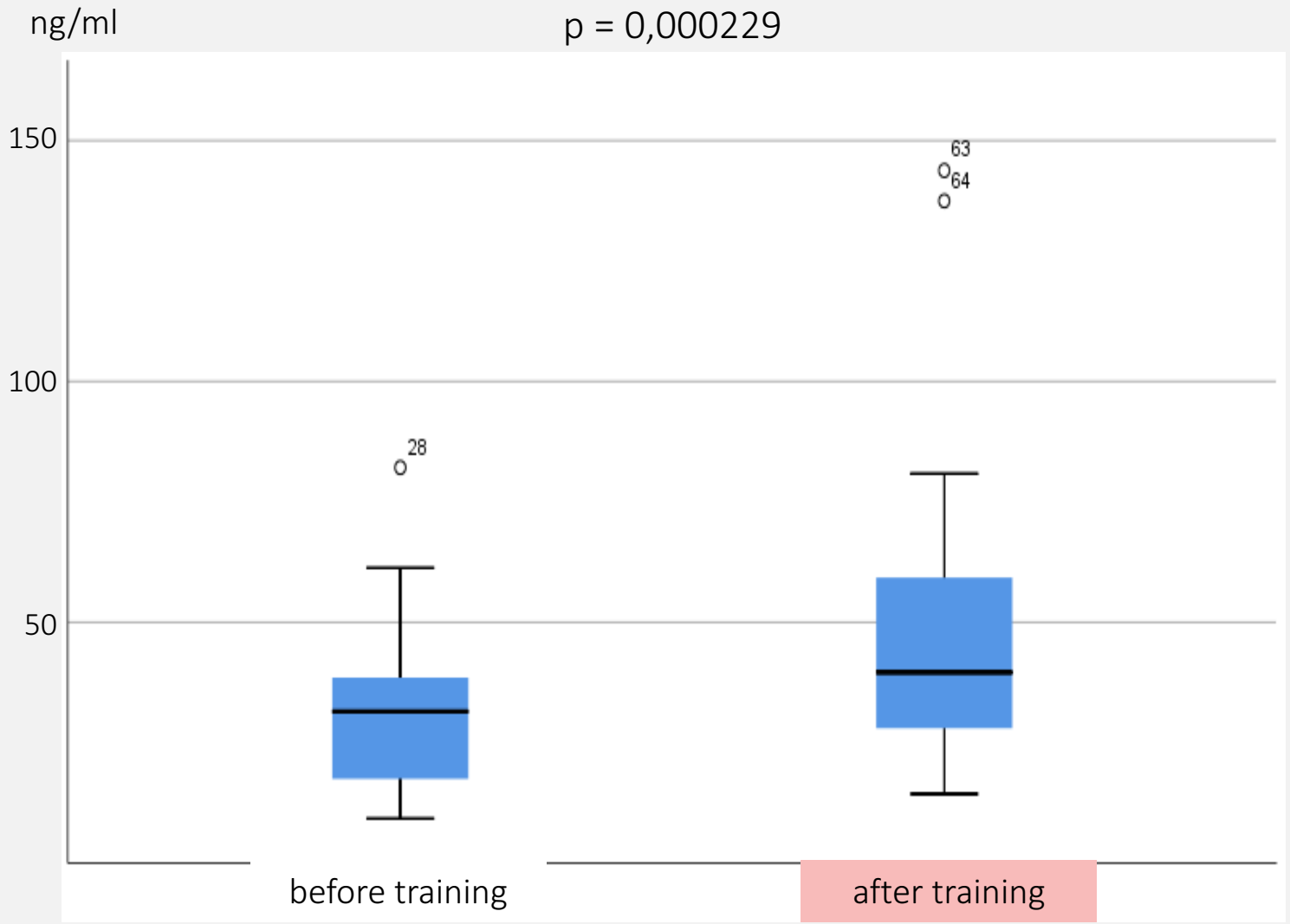

Rehab & Recovery
9 minute warmup
Press START/RESUME when ready
START
PAUSE
STOP
BACK
push to unlock


VEGF - regulator of new blood vessels creation
CD31, CD34 - antigens specific for vessels endothelium

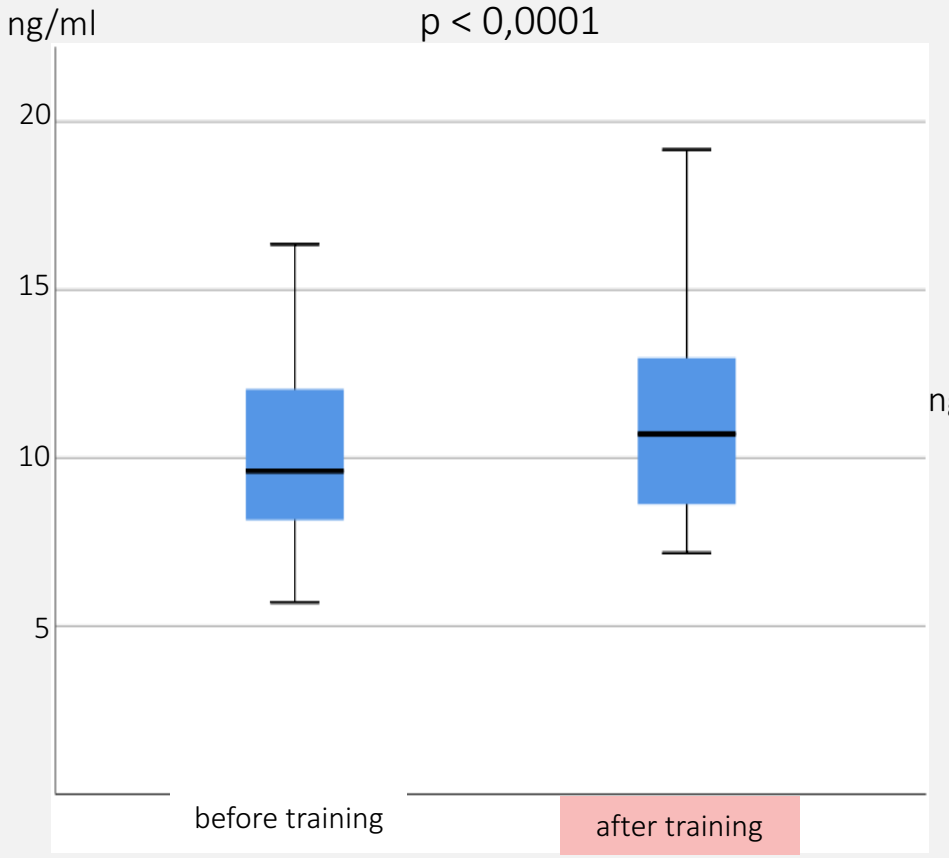

stiffness index, reflexion index arterial stiffness
reactive hyperaemia index
vasodilator response to ischaemia

RESULTS

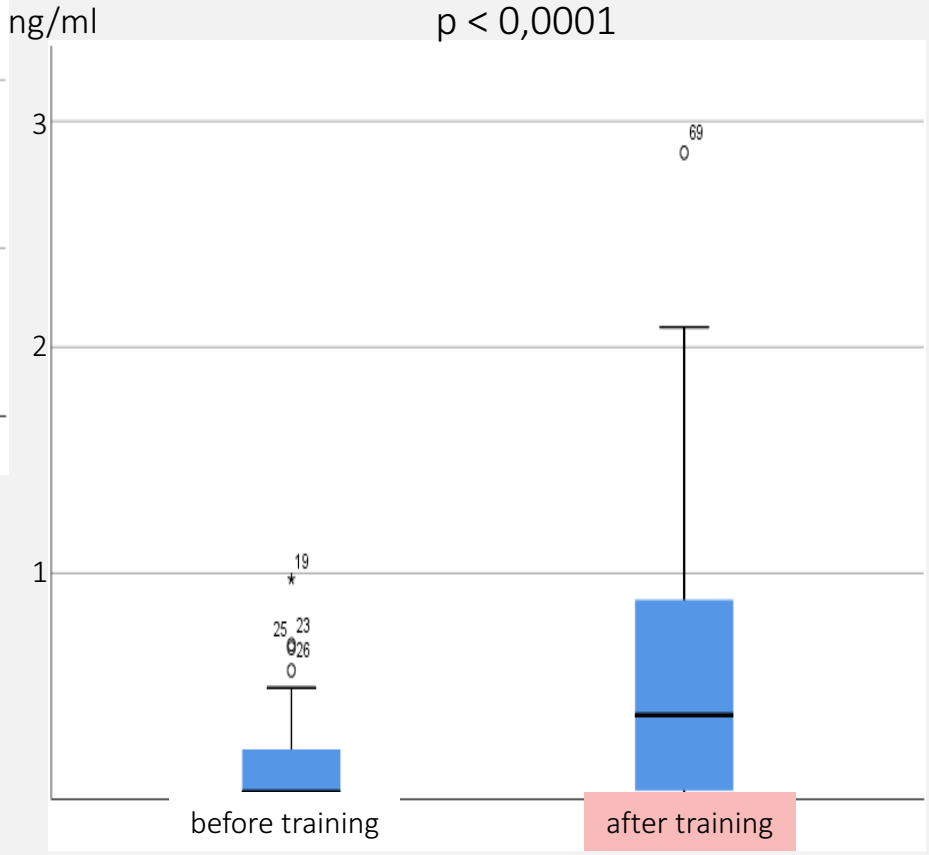
VEGF


ng/ml
p = 0,000229
150
100
50
63
64
28
before training
after training

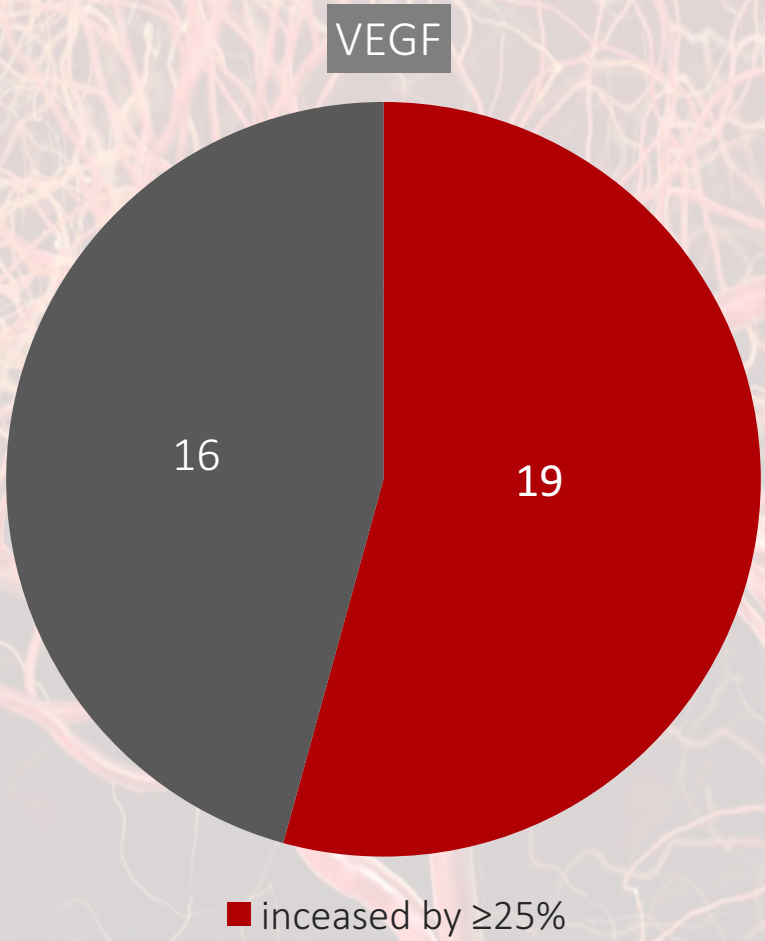
CD31

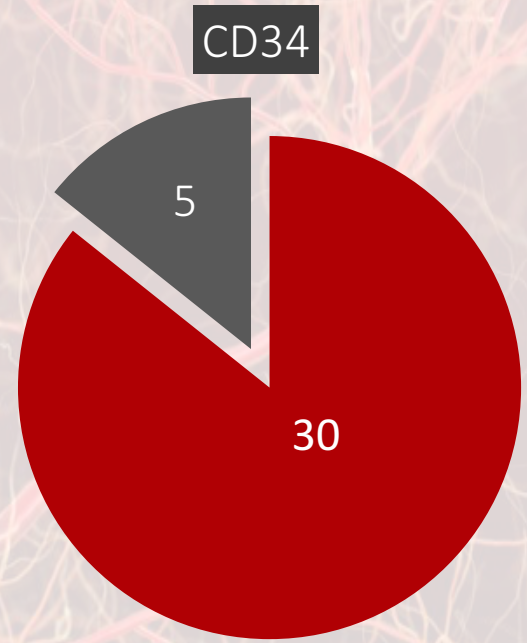

ng/ml
p < 0,0001
20
15
10
5
before training
after training

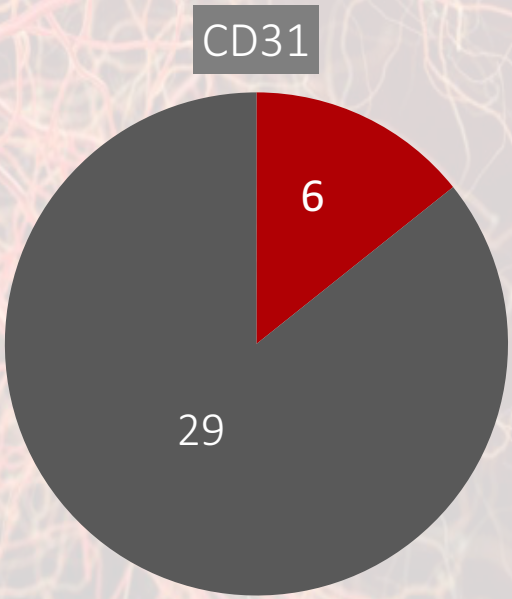
CD34


ng/ml
p < 0,0001
3
2
1
69
19
25
23
26
before training
after training

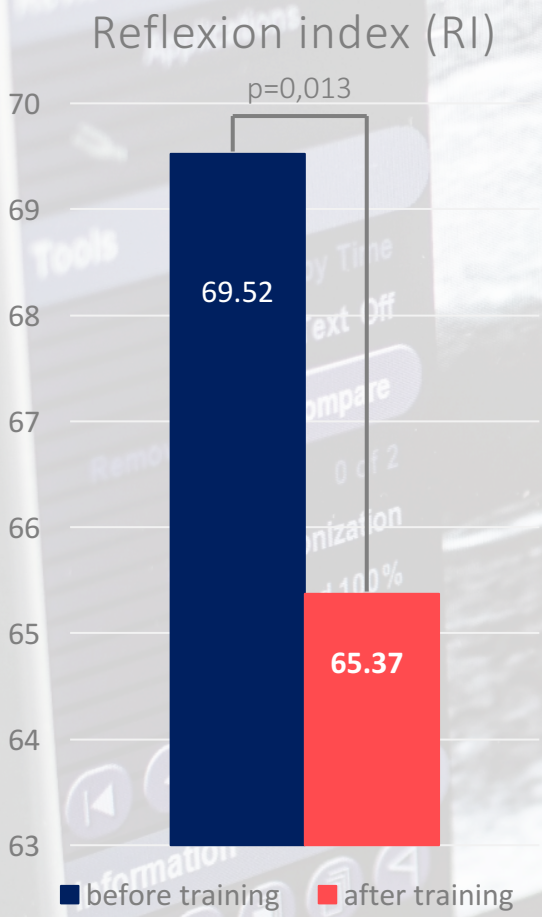
NUMBER OF PARTICIPANTS WITH ≥25% INCREASE IN LABORATORY PARAMETERS

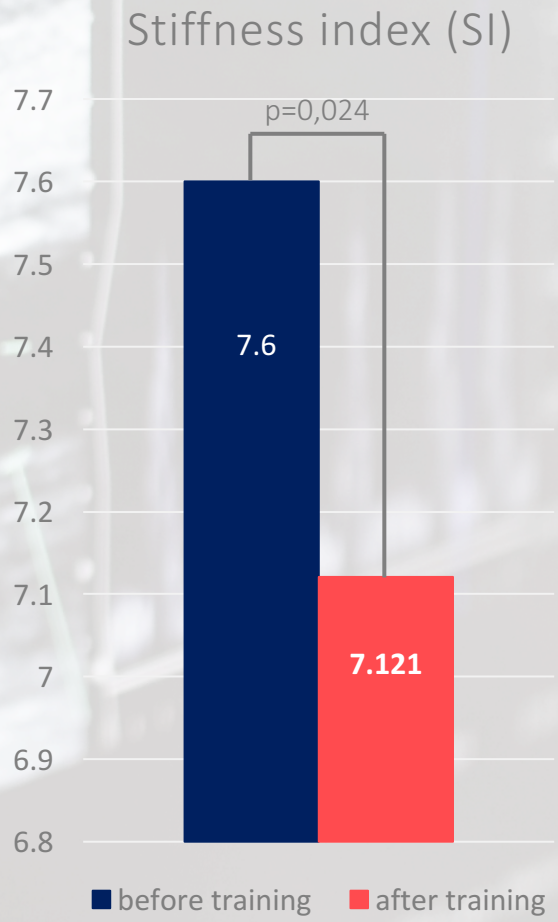




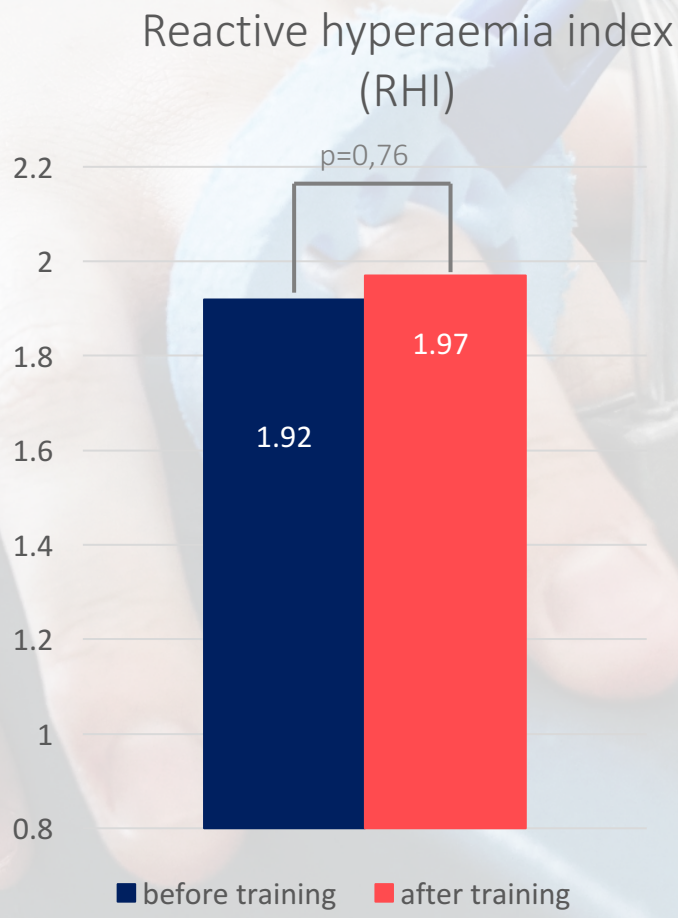


CHANGES IN ARTERIAL STIFFNESS PARAMETERS



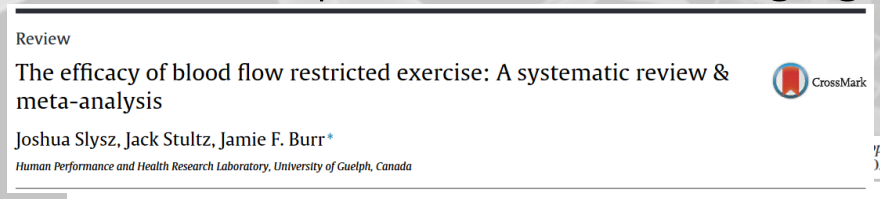


ENDOTHELIUM-MEDIATED CHANGES IN VASCULAR TONE



DISCUSSION

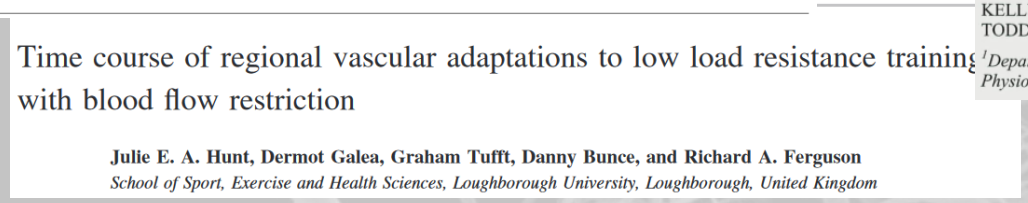
- Restricted blood flow exercise:
  stimulates increases in skeletal muscle size and strength (Slysz, Stultz, & Burr, 2016),
  enhances skeletal muscle capillary growth (Hunt et al., 2013)
  and expression of some angiogenic genes (Larkin et al., 2012)


Review

The efficacy of blood flow restricted exercise: A systematic review & meta-analysis

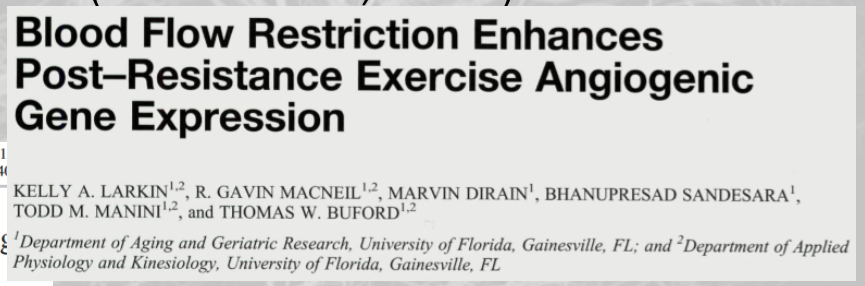
Joshua Slysz, Jack Stultz, Jamie F. Burr*

Human Performance and Health Research Laboratory, University of Guelph, Canada


Time course of regional vascular adaptations to low load resistance training with blood flow restriction

Julie E. A. Hunt, Dermot Galea, Graham Tufft, Danny Bunce, and Richard A. Ferguson

School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, United Kingdom


Blood Flow Restriction Enhances Post–Resistance Exercise Angiogenic Gene Expression

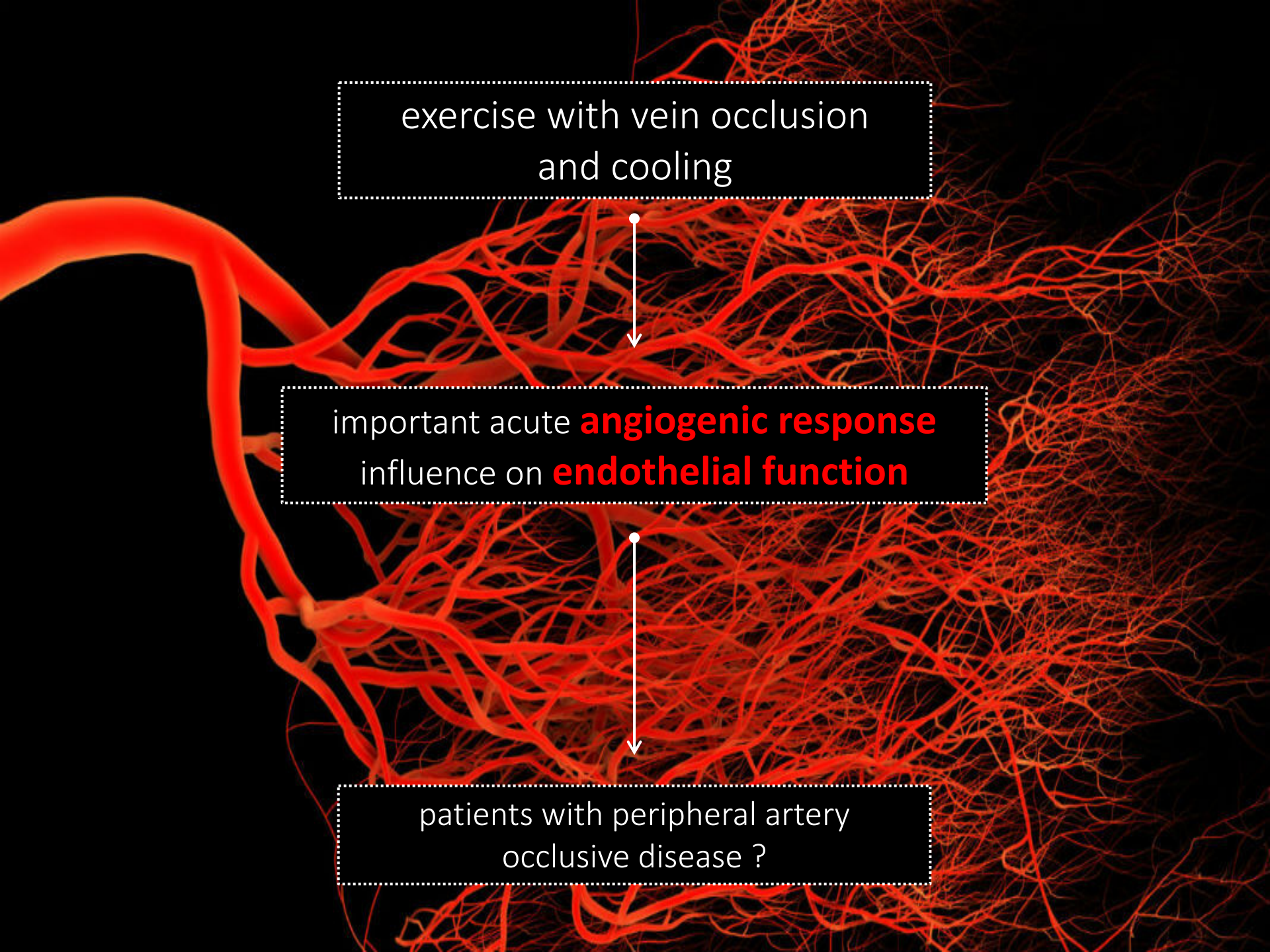
KELLY A. LARKIN[1,2], R. GAVIN MACNEIL[1,2], MARVIN DIRAIN[1], BHANUPRESAD SANDESARA[1], TODD M. MANINI[1,2], and THOMAS W. BUFORD[1,2]

[1]Department of Aging and Geriatric Research, University of Florida, Gainesville, FL; and [2]Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL

- changes in arterial siffness parameters – **acute changes in endothelial function**

- increased VEGF, CD31, CD34 – **acute neoangiogenesis activation**

CONCLUSIONS


exercise with vein occlusion
and cooling
important acute angiogenic response
influence on endothelial function
patients with peripheral artery
occlusive disease ?

THANK YOU
FOR YOUR ATTENTION!