

Inspiration

- ▶ *physiology*: inhalation
- ▶ *stimulation of creativity or intellect*: spark, flash, eureka

Inspire - Ancient Greek πνέω (pnéō, “breathe”)

Wim Hof Method

Science, Safety & Practical Application

DR. JOSEPHINE WORSECK

The Wim Hof Method

► Practical Application



Cold
Breathing
Mindset



The Wim Hof Method

► Practical Application



How to implement the WHM into daily life

Create a morning routine:

- Stretch to open rib cage and diaphragm (10 min)
- Include 3-4 Rounds of WHM Breathing at the end (15 min)
- Meditate (15 min)
- Take a cold shower (5 min)

Start happy, healthy and strong into your day!

The Wim Hof Method

► Three Pillars

Cold
Breathing
Mindset



The Wim Hof Method

► Breathing: Steps

Take 30 – 40 deep Breaths

Let the air flow like a wave: breathe into your belly and then further up into your chest

Retention on the Exhalation

Hold your breath after the final exhale till the urge to breathe arises

Retention on the Inhalation (10-15 sec)

Take one more deep breath and hold it for another 10 to 15 seconds

Repeat this cycle 3-4 times



The Wim Hof Method

► Breathing: Safety

Safety Warnings

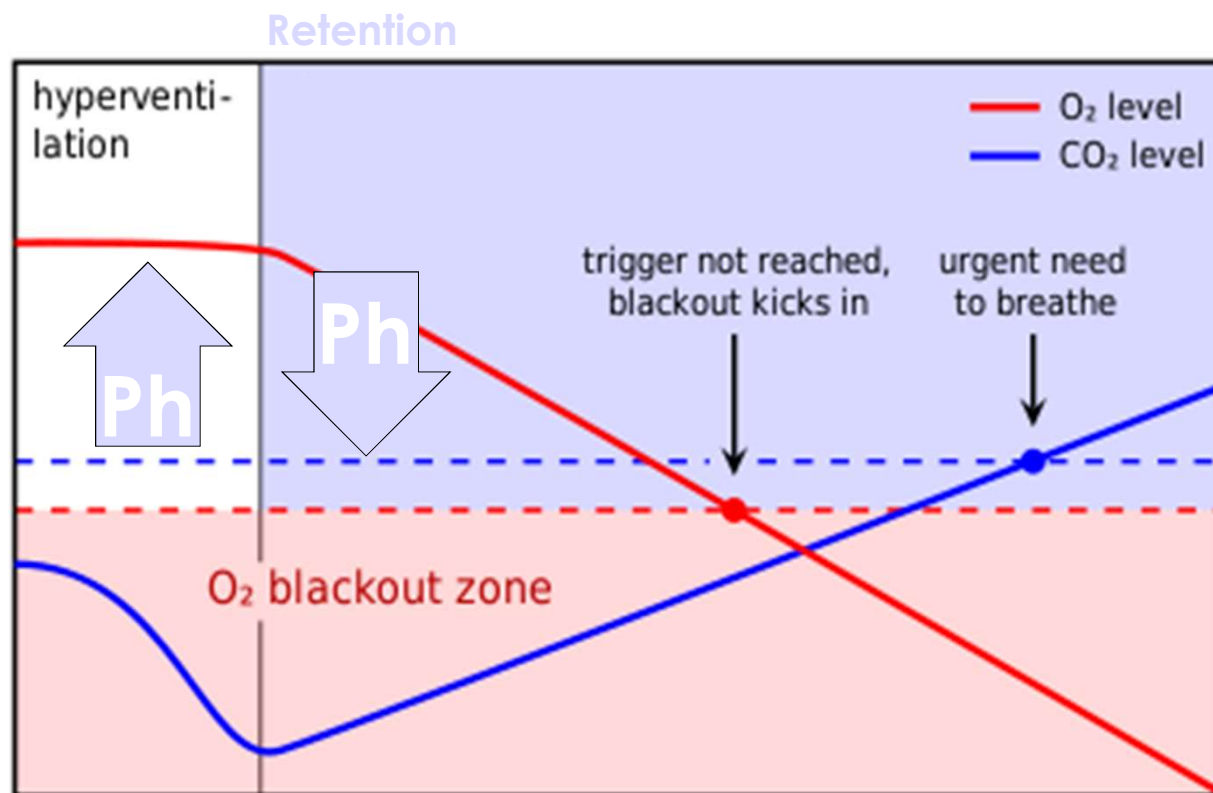
- Practice in a safe environment, sitting or lying down
- Never before or during diving, driving, swimming, taking a bath
- Breathing may cause tingling sensations, a ringing in the ears, and/or lightheadedness

Breathing: once a day, 3-5 rounds



The Wim Hof Method

► Breathing: O₂ / CO₂ Ratio



The Wim Hof Method

► Cold Exposure: Steps

Step 1

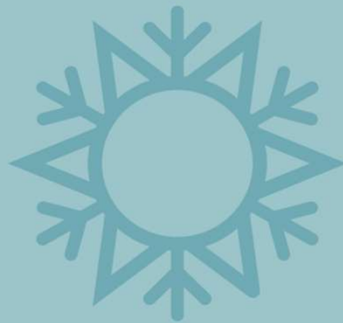
Prepare yourself by doing the breathing

Step 2

- Exclude the world around you
- Set your intention
- take deep, calm, regular breaths in the water Do NOT perform the WHM breathing technique

Step 3

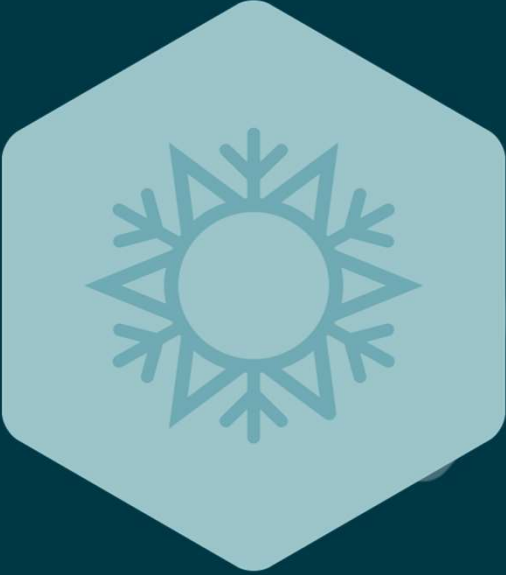
Keep focus as you exit the water and warm up by doing the horse stance



The Wim Hof Method

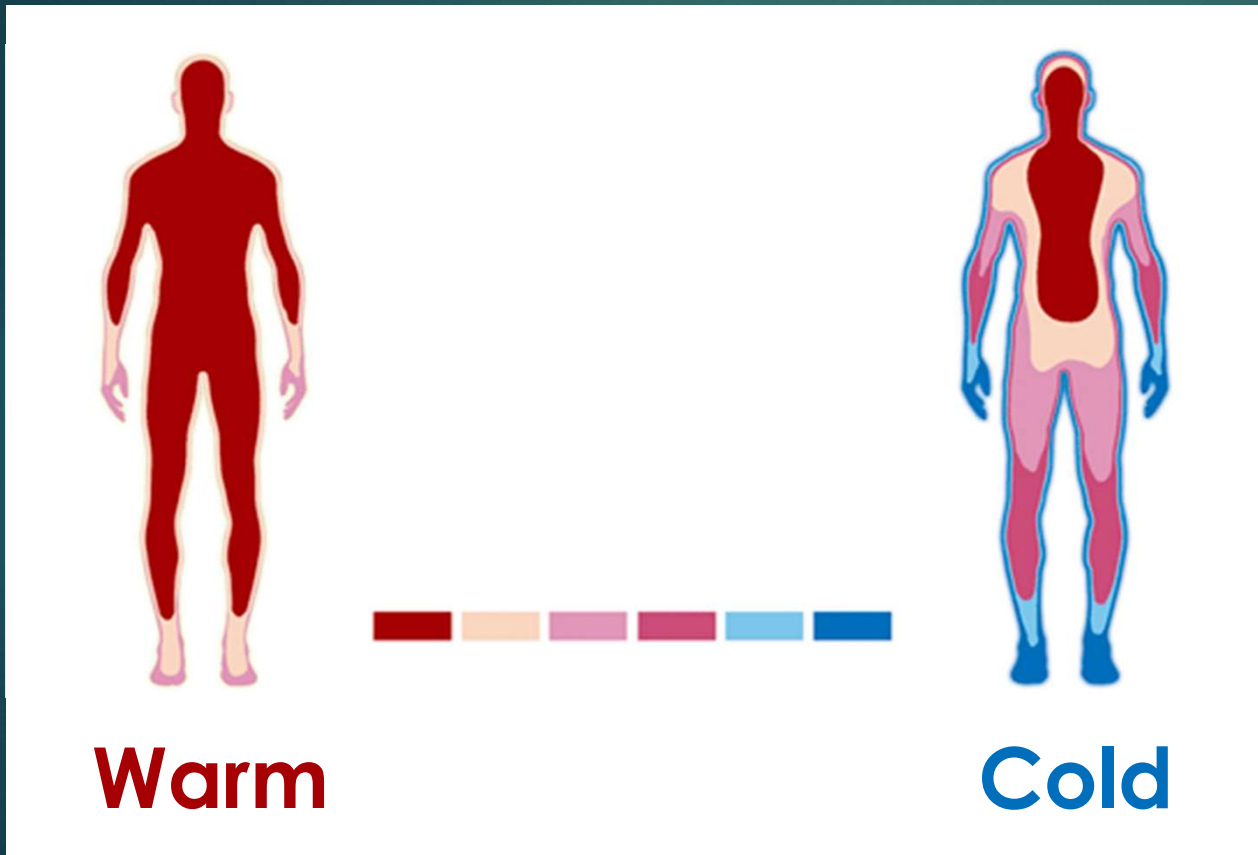
► Cold Exposure: Safety

Safety Warnings

- 
- extreme cold can be a shock to your body
 - start slow and gradually build up exposure
 - always train without forcing anything, and listen to the signals from your body
 - risk of hypothermia
 - Ice Bath: once till twice a week (2 min)
 - Cold Shower: every day

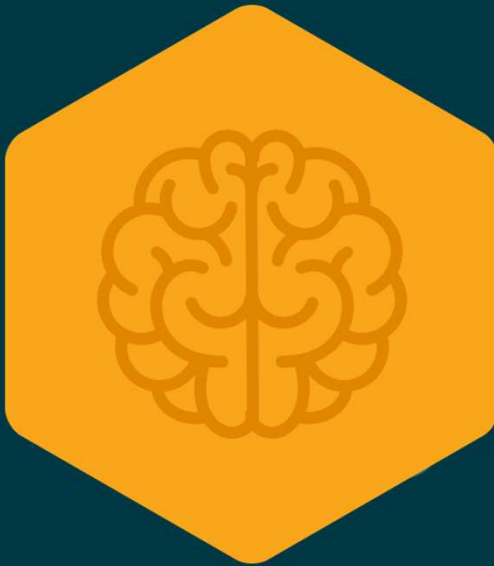
The Wim Hof Method

► Cold Exposure: Afterdrop



The Wim Hof Method

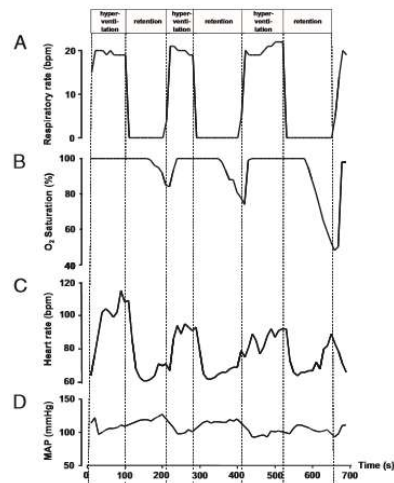
► Mindset



The most overlooked pillar

- A single breathing session or ice bath has a powerful positive effect
- With sustained practice you change your physiology and experience lasting benefits.

Meditation, Yoga or other mindful practices are best performed daily



	Start	End hyperventilation	End retention	End hyperventilation	End retention	End hyperventilation	End retention
pH	7.40	7.66	7.44	7.67	7.46	7.75	7.50
pCO ₂ (kPa)	4.49	2.11	4.01	2.03	3.76	1.69	3.48
pO ₂ (kPa)	16.5	22.0	5.6	22.9	4.8	22.6	3.4
HCO ₃ ⁻ (mmol/l)	20.9	18.0	20.3	17.6	20.2	17.4	20.4
Lactate (mmol/l)	0.69	0.86	0.69	1.03	0.77	1.16	0.91

Fig. 2. Cardiorespiratory and biochemical changes during cyclic hyperventilation and breath retention in a representative subject of the trained group. (A) The respiratory rate alternately increased to around 20 breaths per minute (bpm) for several minutes, and then dropped to zero during voluntary breath retention. These cyclic changes in respiration resulted in profound changes in (B) oxygen saturation, (C) heart rate, and (D) mean arterial pressure. The data depicted were sampled from the monitor every 10 s. At the end of each hyperventilation phase and breath retention phase, an arterial blood sample was drawn for arterial blood gas analysis, of which the results are listed in the table below D. The cycles of hyper/hypo-ventilation in this particular subject can be viewed in [Movie S2](#).

Voluntary activation of the sympathetic nervous system and attenuation of the innate immune response in humans

Matthijs Kox^{a,b,c,1}, Lucas T. van Eijk^{a,c}, Jelle Zwaag^{a,c}, Joanne van den Wildenberg^{a,c}, Fred C. G. J. Sweep^d, Johannes G. van der Hoeven^{a,c}, and Peter Pickkers^{a,c}



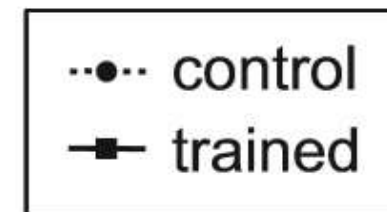
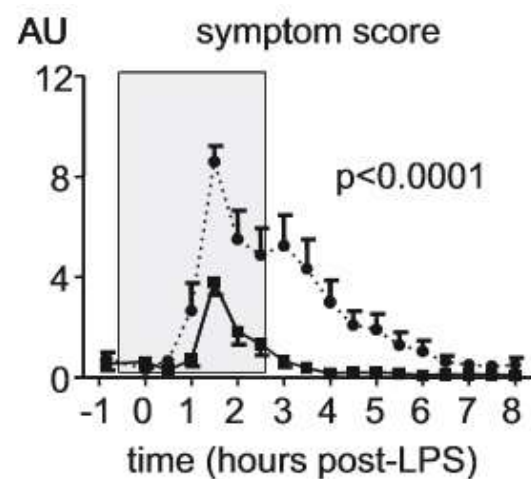
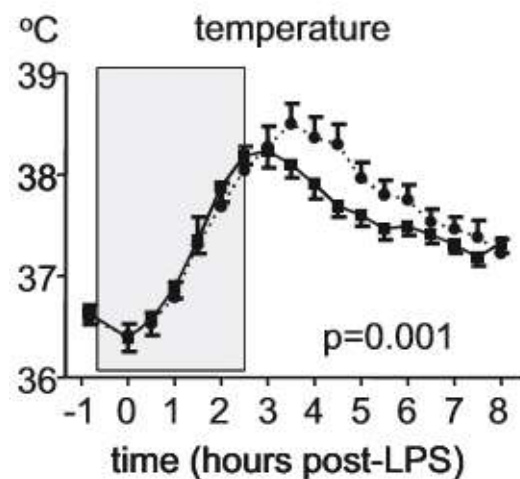
WHM Training



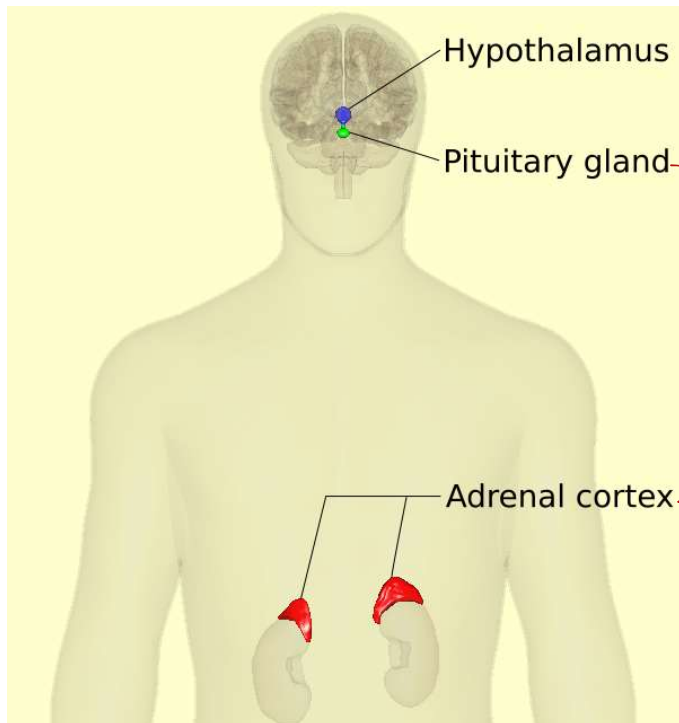
Clinical Setup

Proinflammatory Cytokines

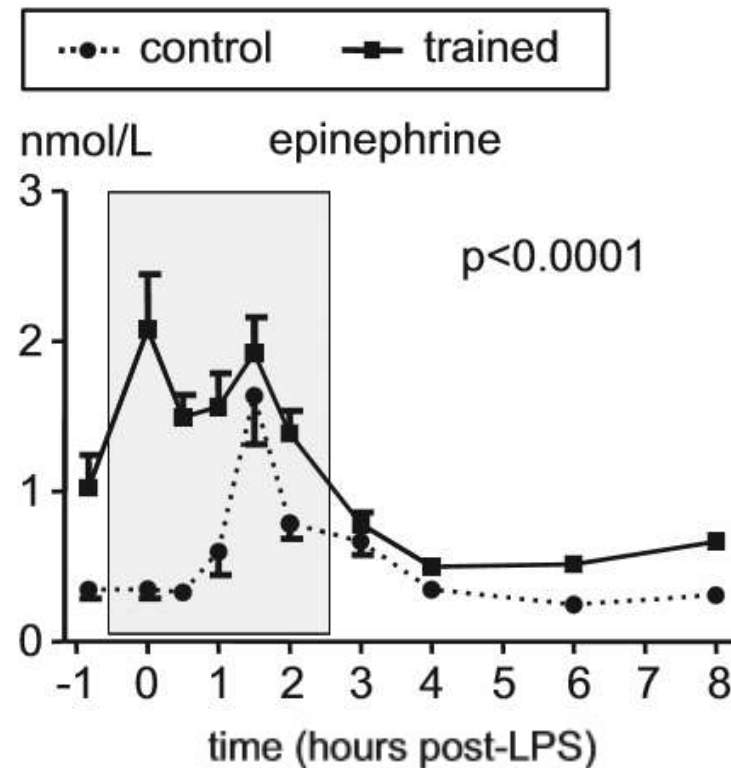
- ▶ trigger pathological pain (Zhang, 2007)
- ▶ cause fever, inflammation, tissue destruction (Dinarello, 2000)



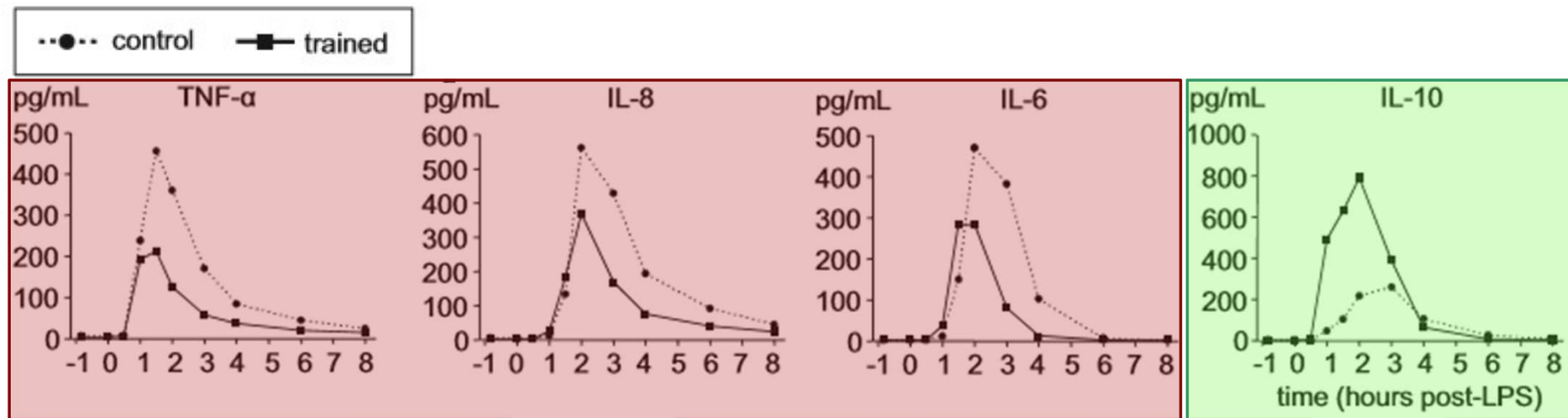
Sympathic Nervous System



▶ Adrenaline = Epinephrine



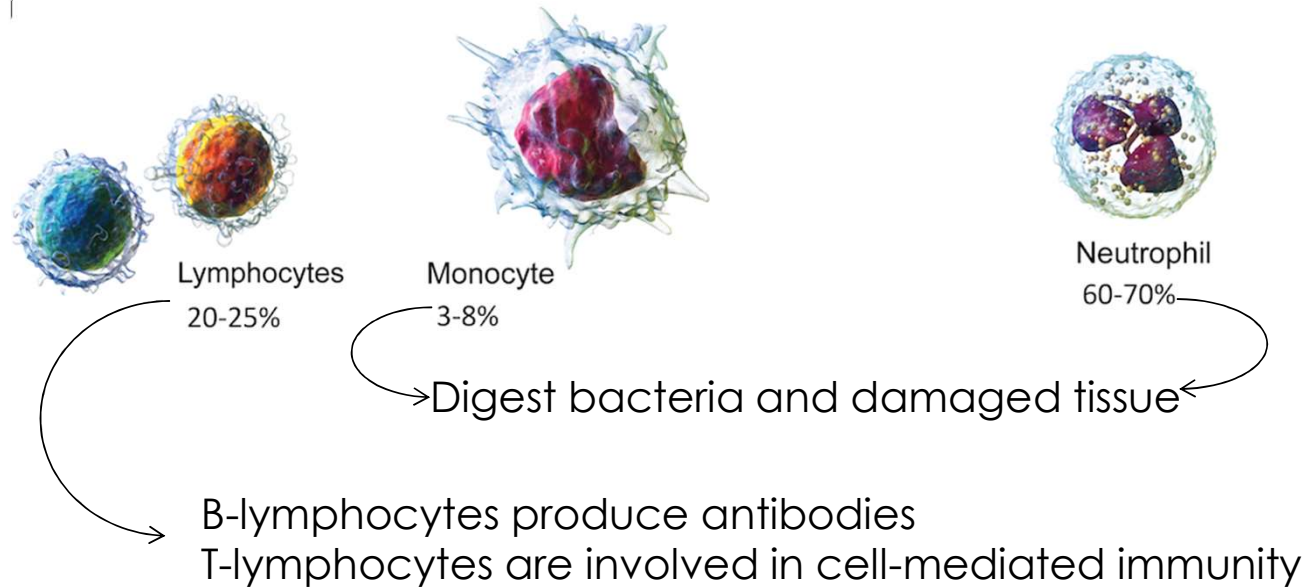
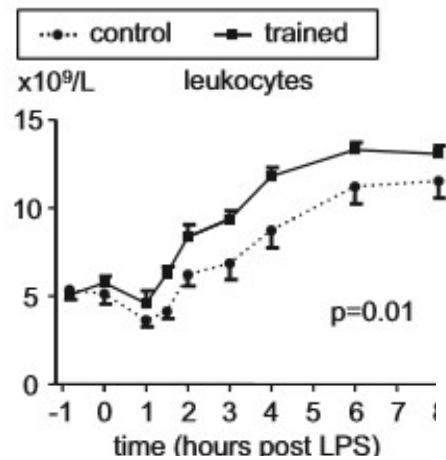
Innate Immune Response



Proinflammatory cytokines
are significantly attenuated

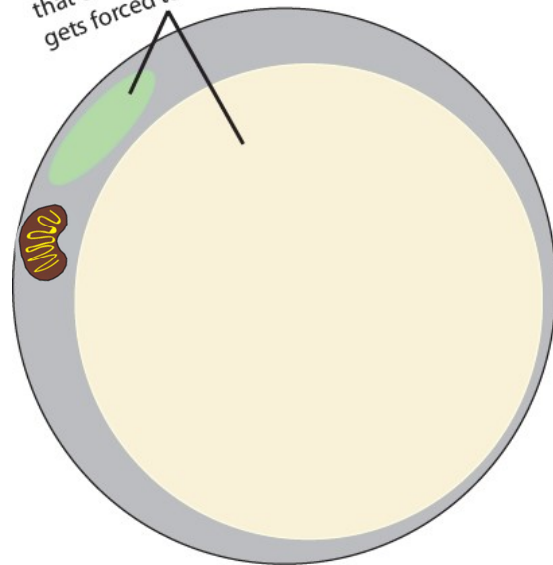
Anti-inflammatory cytokine
IL-10 is markedly increased

Leukocytes

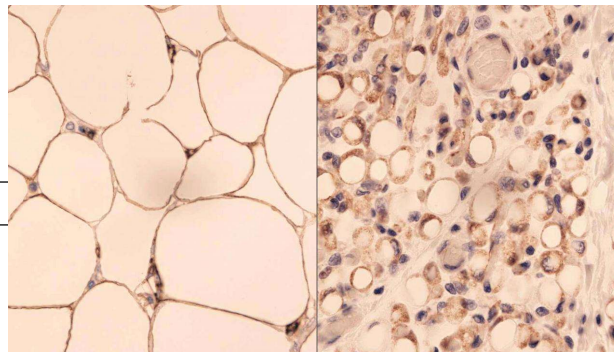


Brown Fat Tissue

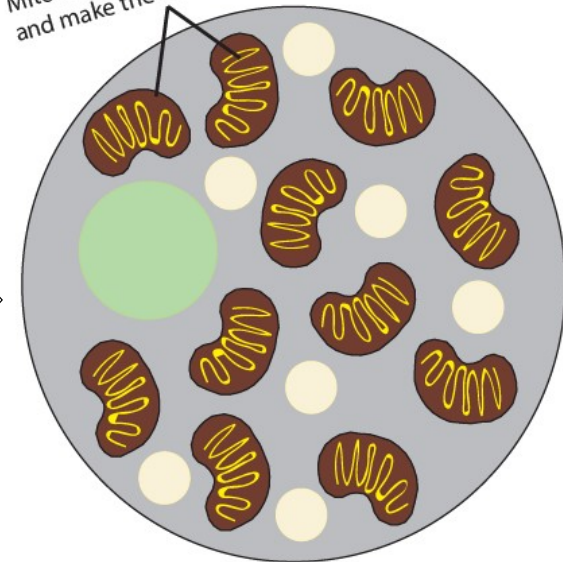
The fat drop is so large
that everything else
gets forced to the edge



White Fat Cell
0.1 – 0.2 mm in diameter



Mitochondria generate heat
and make the cell brown

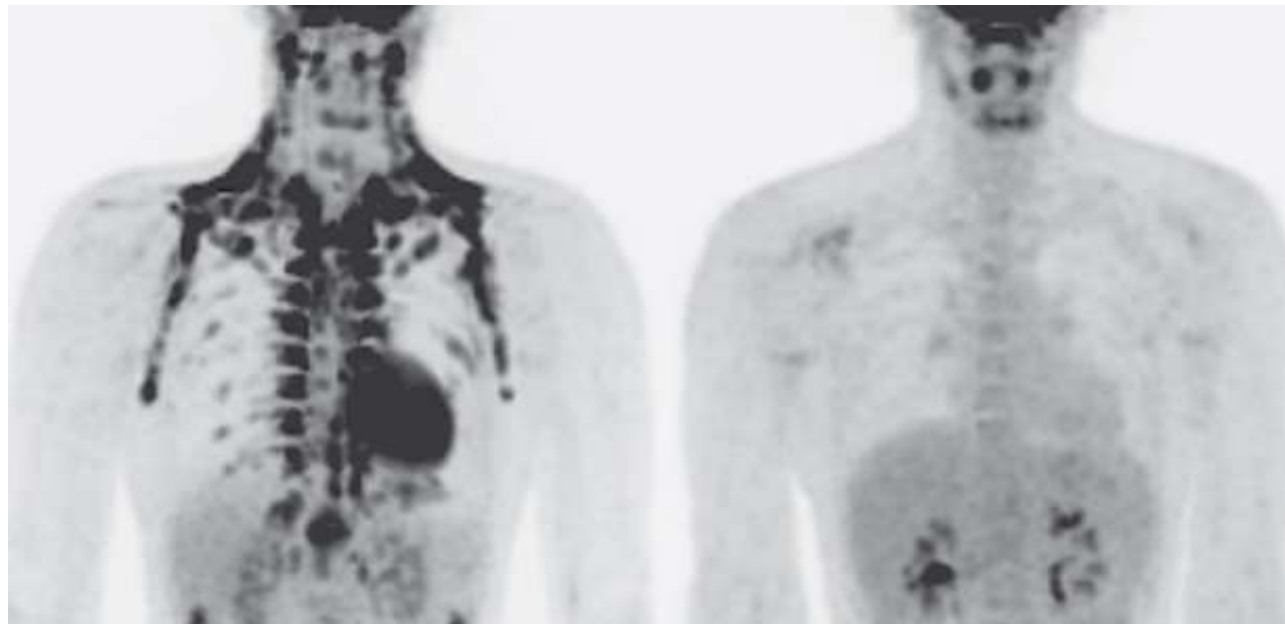


Brown Fat Cell
0.05 – 0.1 mm in diameter

Brown Fat Tissue Activity

PET-CT

scan shows physiologic uptake and distribution of ^{18}F -fluorodeoxyglucose



Cold Exposure 16° C vs. Thermoneutral Conditions 22°C

Let`s prepare for the ice bath...