

# eCelsius Performance Connect brochure

**A system for a reliable and accurate temperature monitoring**

*Scientifically approved  
Gold standard for core temperature monitoring*

# Summary

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Current human fields of application

**slide 4**

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eCelsius Performance Connect  
specifications

**slide 6**

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eCelsius Performance Connect added  
value

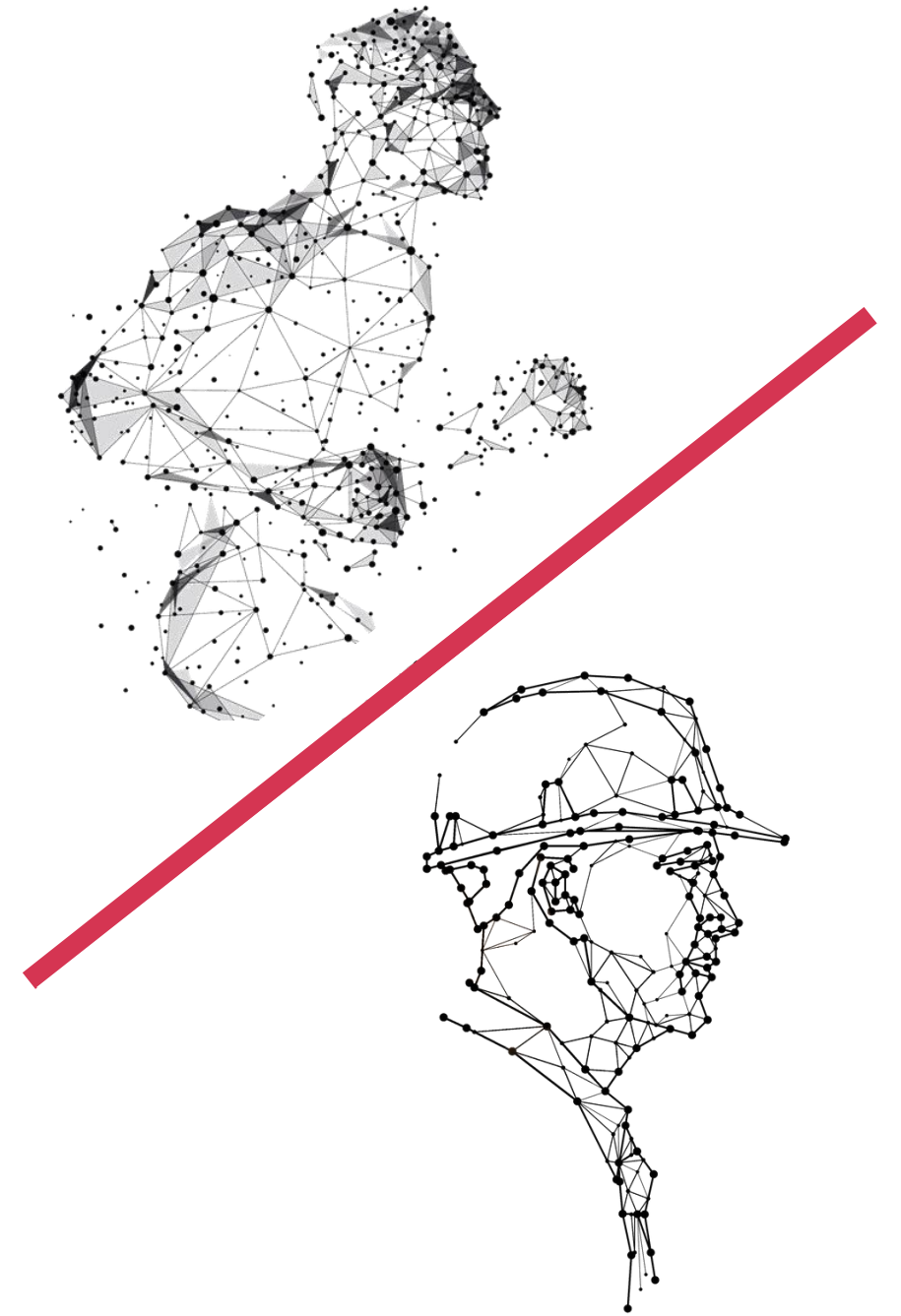
**slide 8**

4

Examples of research study

**slide 9-14**

# Current human fields of application



# Current human fields of application

## Few examples



### SPORTS APPLICATIONS

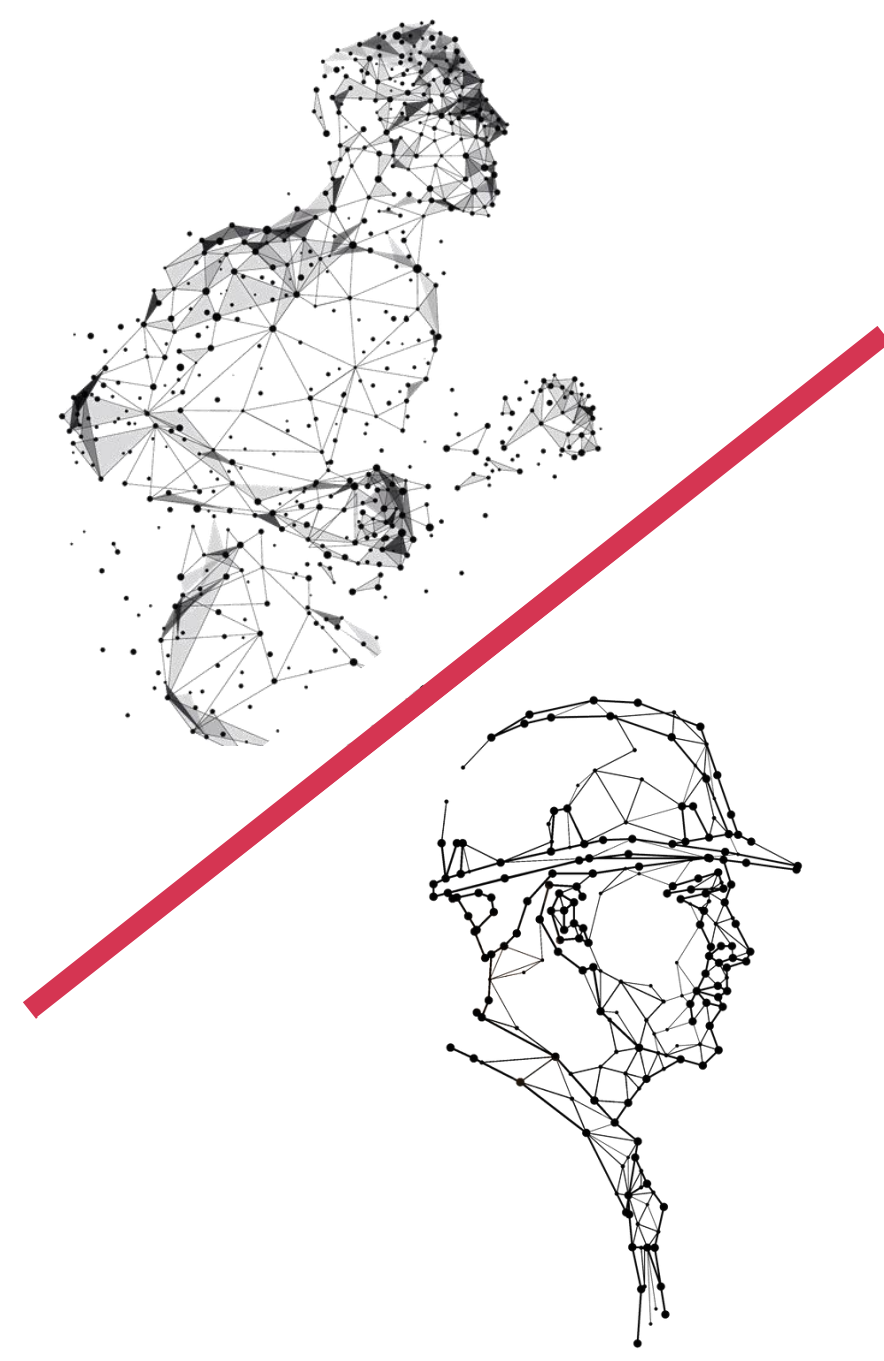
- Performance assessment/optimization
- Thermoregulation - Heat acclimatization
- Hypothermia/Hyperthermia prevention
- Warm up – recovery process optimization
- Preventing, quantifying and avoiding the Jet-Lag issue



### OCUPATIONNAL HEALTH APPLICATIONS

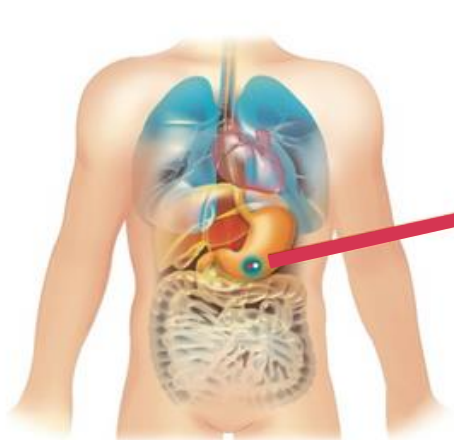
- Temperature monitoring for soldiers
- Temperature control for fireman, rescue divers
- Thermoregulation - Heat stroke prevention

# About eCelsius Performance Connect



# Introduction

## eCelsius Performance Connect: the essentials



eCelsius Performance capsule

RF 433Mhz



ePerf Connect



Activation box to turn on the capsule



ePerf Mobile App

Communication range between capsule and ePerf Connect in real time : 1 to 3m (depending on subject & environment)

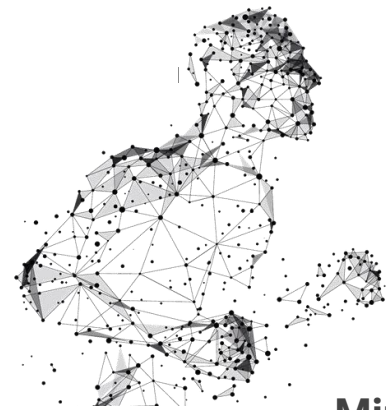
# About eCelsius Performance Connect

## Specifications

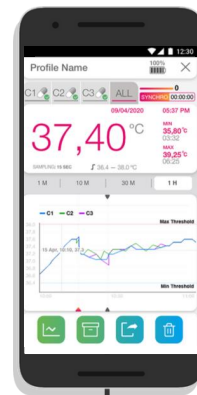


### eCelsius Performance CAPSULE SPECIFICATION

Capsule cleaning	Standardized cleaning process
Size (Diameter x length)	17.7mm x 8.9mm
Weight	1.7g
Temperature accuracy	+/-0.2°C (+/-0.36°F)
Temperature resolution	0.01°C (0.03202°F)
Life duration	20 days
Shelf life	2 years
Measurement period available	15s, 30s, 1min, 2min, 5min
Temperature range	25-45°C (77-113°F) below 25°C consult us



Minimum weight 40kg




**e-Perf Mobile App:**  
To configure the watch  
and visualize the data  
collected & recorded

For Android  
Smartphone/Tablet  
(available on Google  
Play Store)




### Equipment



**eCelsius Perf ACTIVATOR SPECIFICATION: to turn on the capsule**

<b>Size</b>	69mm x 59mm x 31mm
<b>Shelf life</b>	2 years



**ePerf Connect SPECIFICATION: to collect and record data**

<b>Size</b>	52mm x 25mm x 15mm
<b>Weight</b>	33g
<b>Number of capsule associated</b>	Up to 3 capsules
<b>Storage</b>	150 000 data
<b>Autonomy</b>	5 days
<b>Water resistant</b>	5 ATM



**Few parameters may impact the performance of the system:**

- The subject morphology
- The environment (metal, ...)
- Your own protocol

We can advise & help you to define the best configuration for your study.

# eCelsius Performance Connect added value

## Technical specifications:



### CAPSULE INTERNAL MEMORY

Embedded memory in the capsule allows to continuously store the last 2000 collected data independently of the life duration.



### MEASUREMENT PERIOD

Several sampling frequency are available and can be changed all along the monitoring.



### SIMPLE WAY OF WORKING

After activation and ingestion, the capsule automatically collects and transmits accurate and reliable temperature data to the ePerf Connect watch.



### ACCURATE DATA

eCelsius Performance guarantees you an accuracy of +/- 0.2°C.

## Other:



### ADD MARKERS

Markers can be added all along the experiment to highlight a specific event.



### LIGHTWEIGHT & TINY

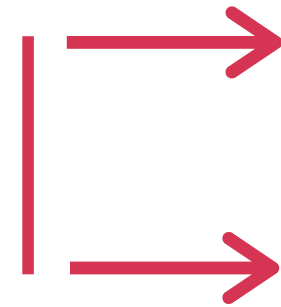
Capsules are lightweight 1.7g and measure 17.7mm x 8.9mm.



### DESIGNED FOR HUMAN SUBJECT

Designed only for human subject with a minimum weight of 40kg.

## Scientific advantages:



### NO DATA LOSS

No data loss even if the subject is out of the communication range for a while.



### REAL TIME & A POSTERIORI DATA RECOVERY

If ePerf Connect is in the communication range of the capsule, you can collect real time data. If not, ePerf Connect will synchronize the missing data as soon as the capsule and ePerf Connect are in the same communication range.



### ADAPTABLE MONITORING

During the monitoring, you have the possibility to change the measurement period when you want. In addition to the internal memory, the several sampling frequencies available, allows the system to fit with your protocol.



### TIME SAVER

Save time thanks to quick and easy implementation. Full data set available on site through an Android mobile App.

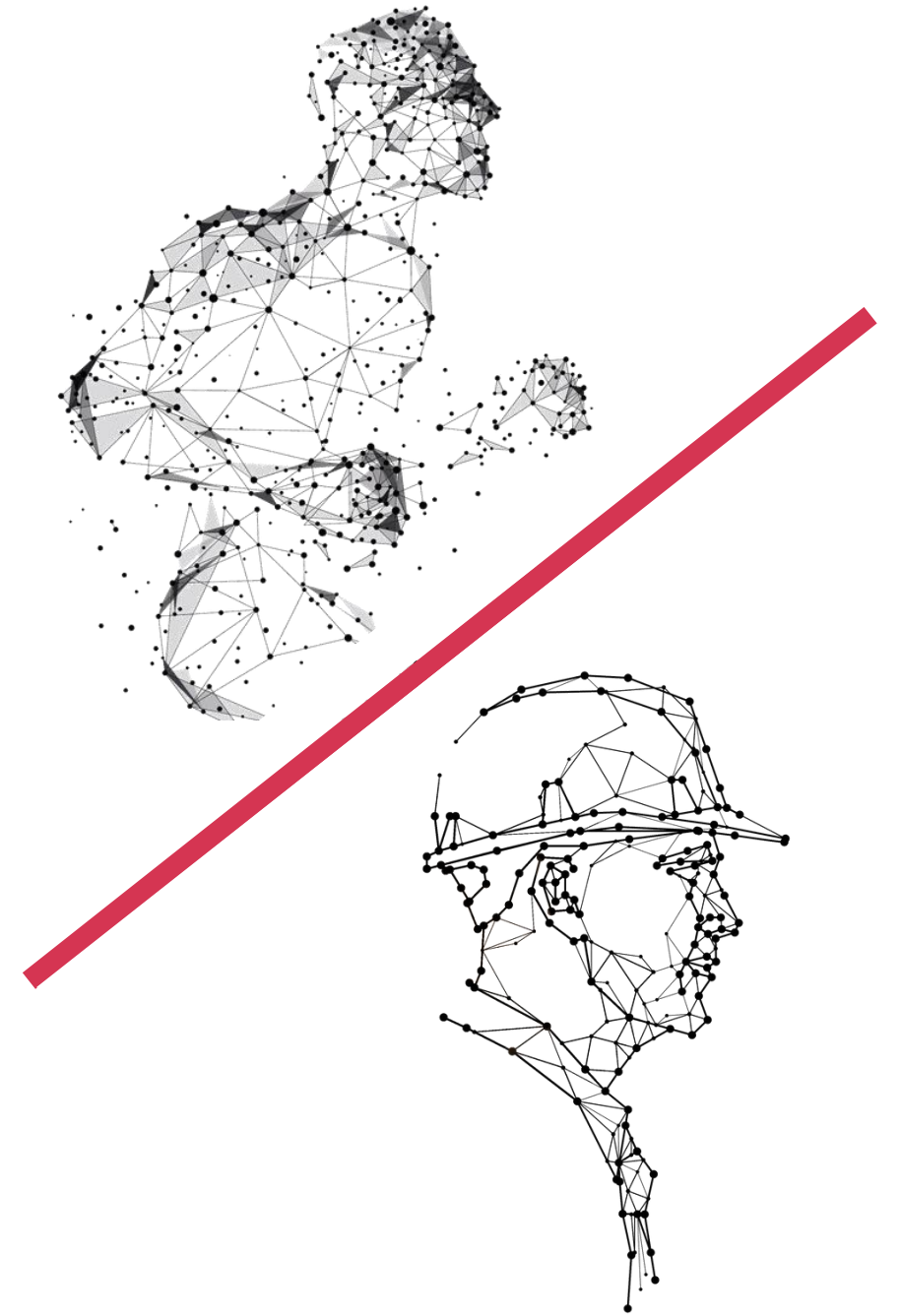


### RELIABLE MONITORING

Accurate data with a resolution of 2 digits.



# Examples of research studies



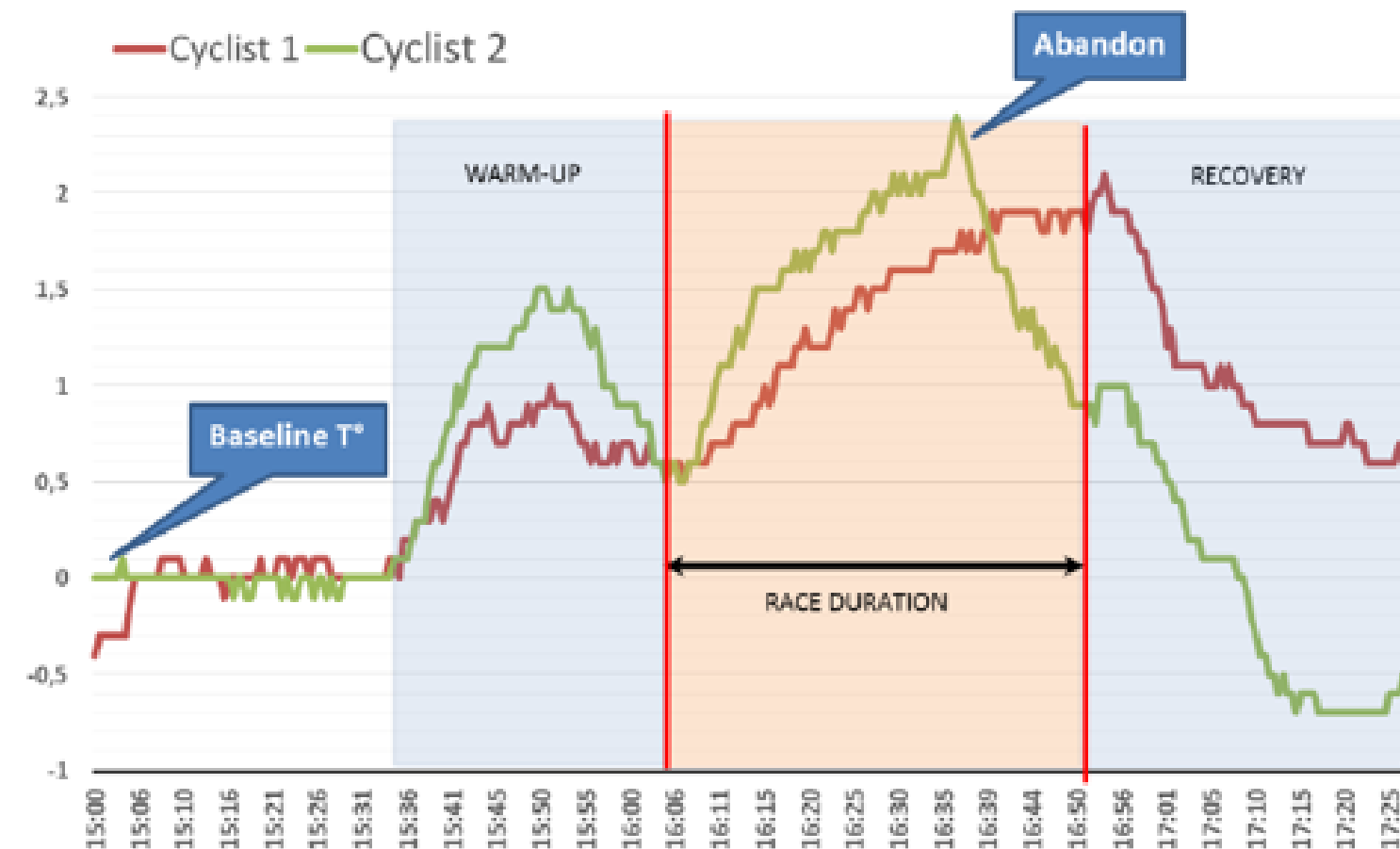
# Examples of research studies

Hyperthermia / heat stroke prevention

## eCelsius Performance Connect ADDED VALUE

- 1 Continuous core temperature control
- 2 Health protection
- 3 Equipment, training/recovery processes assessment

Long duration exercises performed in the heat induce rise in core temperature that could range from hyperthermia to heat stroke.



FDJ pro cycling team, Team Time Trial - World Road Cycling Championship, (Richmond 2015)

## Publications:

Racinais et al., (2018) Core temperature up to 41.5°C during the UCI Road Cycling World Championships in the heat.

Stephenson et al., (2018) High Thermoregulatory Strain During Competitive Paratriathlon Racing in the Heat.

Ioannou et al., (2019) A free software to predict heat strain according to the ISO 7933:2018.

McGarr et al., (2020) Heat strain in children during unstructured outdoor physical activity in a continental summer climate.

# Examples of research studies

## Performance optimization

### eCelsius Performance Connect ADDED VALUE

- 1 Implementation of acclimatization program
- 2 Individual control of acclimation process
- 3 Benefits assessment

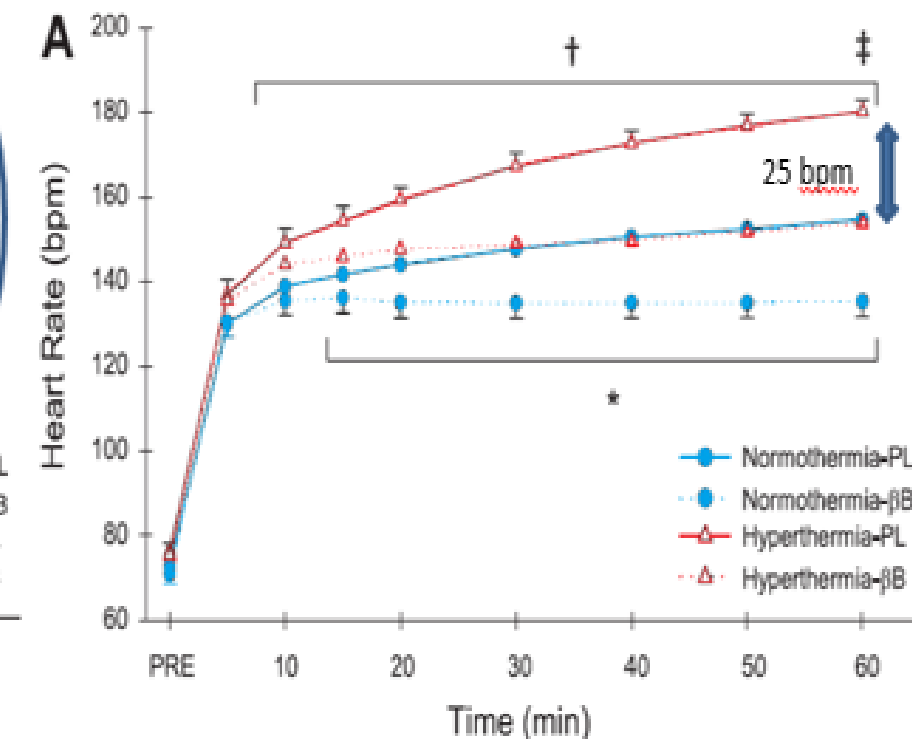
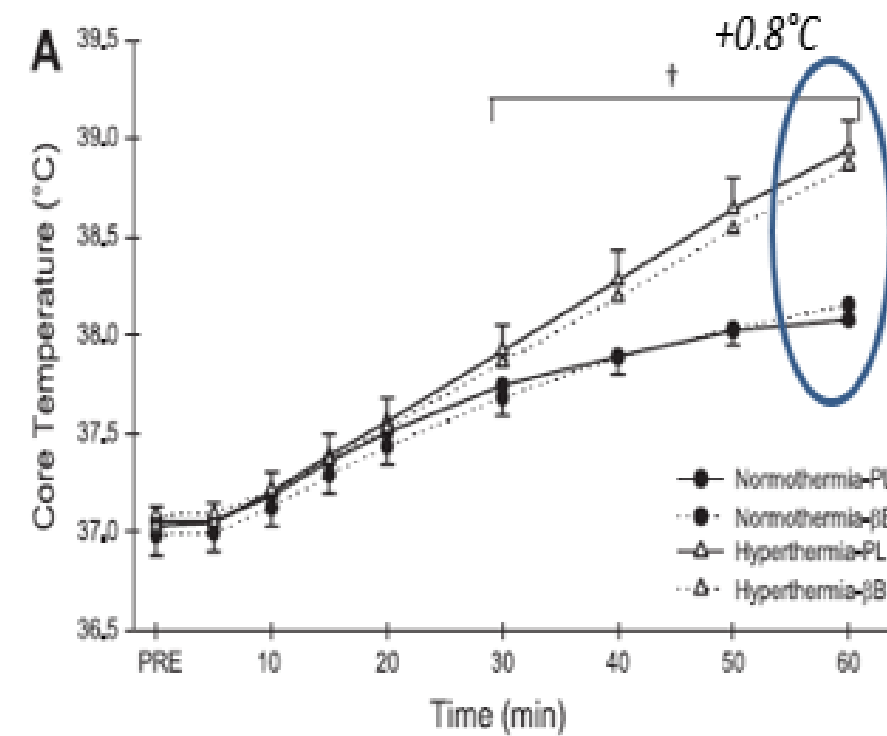
Core hyperthermia is directly correlated to performance decline. The drift of heart rate due to heat exhaustion induces a direct misappropriation of the cardiovascular effort. This loss can be avoided thanks to an individual acclimatization program.

#### Publications:

Roussey et al., (2018) Interactions between perceived exertion and thermal perception in the heat in endurance athletes.

Schmit et al., (2018) Optimizing Heat Acclimation for Endurance Athletes: high versus Low-intensity training..

Stevens et al., (2018) Effect of two-weeks endurance training wearing additional clothing in a temperate outdoor environment on performance and physiology in the heat.



A rise of 0.8°C in core temperature leads to :

- a rise of 25 bpm in submaximal HR
- a significant decrease in stroke volume

# Examples of research studies

Assessment of thermoregulation efficiency

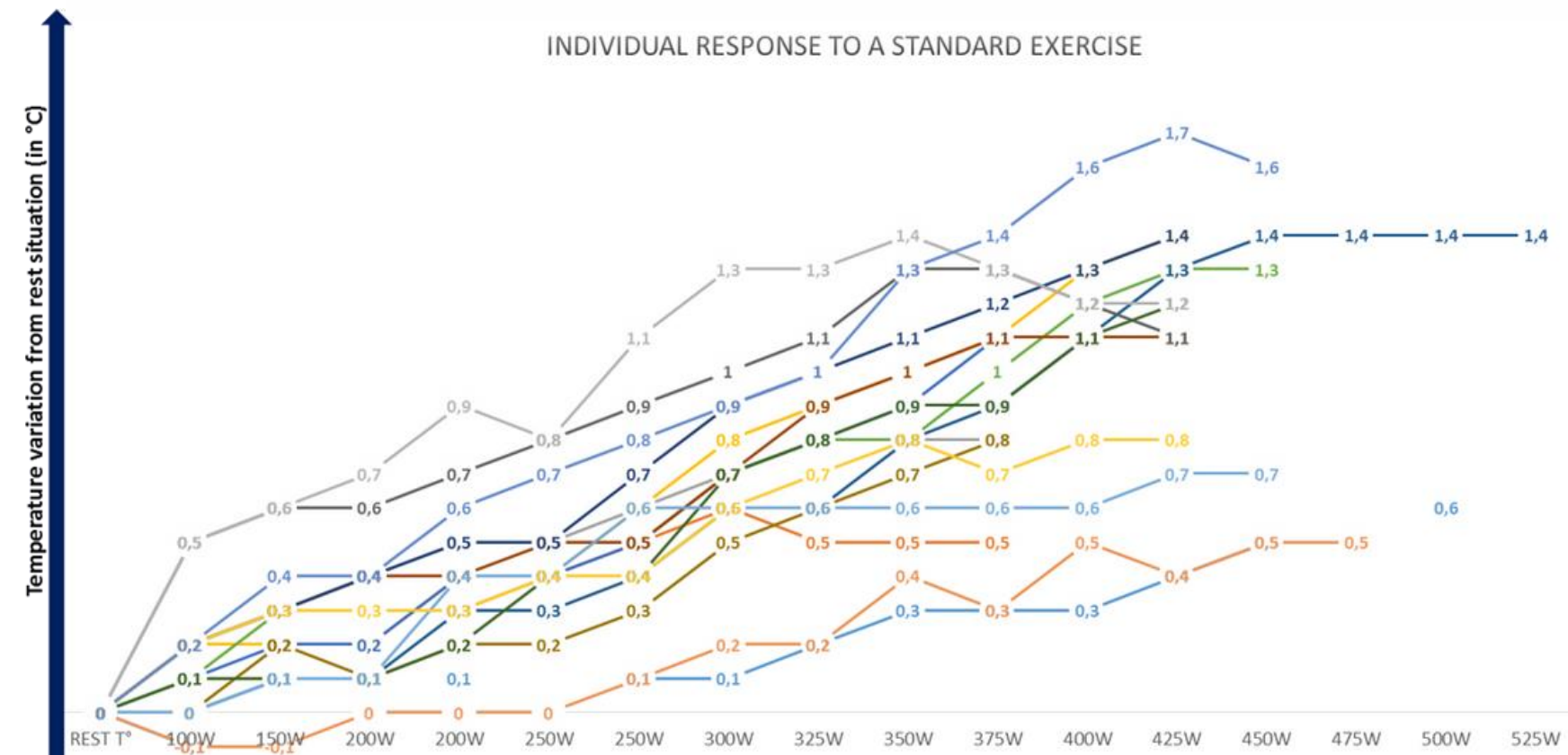
## eCelsius Performance Connect ADDED VALUE

- 1 Define individual thermoregulatory profile
- 2 Implementation of individual acclimatization program
- 3 Individual control of the acclimation process
- 4 Benefits assessment

Thermoregulatory responses are very different among elite athletes. This takes the form of differences in thermoregulatory profiles, adaptations and acute physiological responses (Heart-Rate drift, ...).

### Publications:

- Roussey et al., (2018), Interactions between perceived exertion and thermal perception in the heat in endurance athletes.  
Schmit et al., (2018), Optimizing Heat Acclimation for Endurance Athletes: high versus Low-intensity training.  
Alhammoud et al.,(2020), Thermoregulation and shivering responses in elite alpine skiers.



**Preseason test event with a pro cycling team (2017).**

# Examples of research studies

## Hypothermia prevention

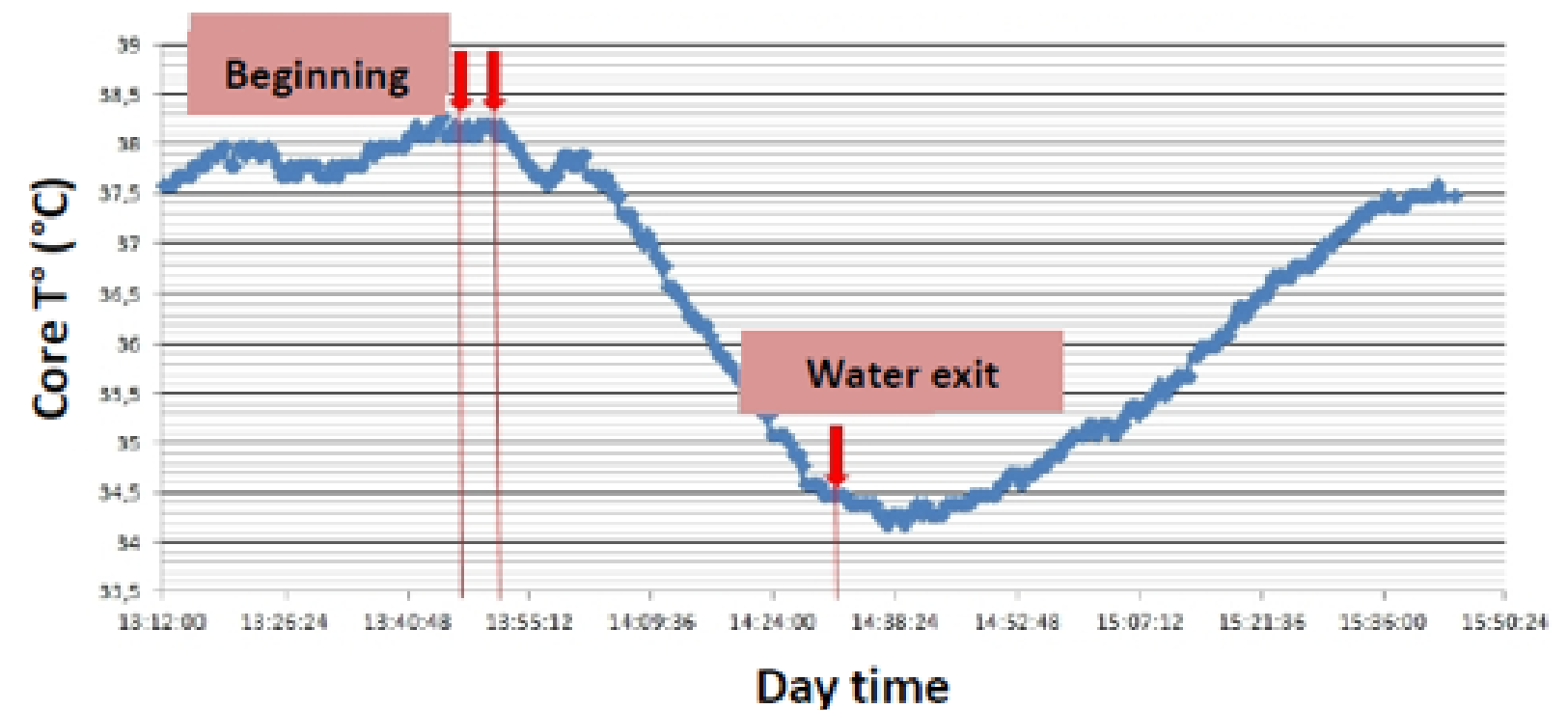
### eCelsius Performance Connect ADDED VALUE

- 1 Health protection
- 2 Equipment assessment
- 3 Assessment of individual resistance to cold temperatures

The monitoring of core temperature in all harsh sport environments which are likely to involve thermal risks (Cold/heat/humidity), allows to study individual coping skills in critical environment.

Core temperature kinetic during swimming training in cold water (9.2°C).

*P.J Pourantru, Miribel, 11/10/16*



### Publications:

Melau et al., (2020), Impact of a 10km cold water swim on Norwegian Naval Special Forces recruits.

Deng et al., (2020), Effects of local heating on thermal comfort of standing people in extremely cold environments.

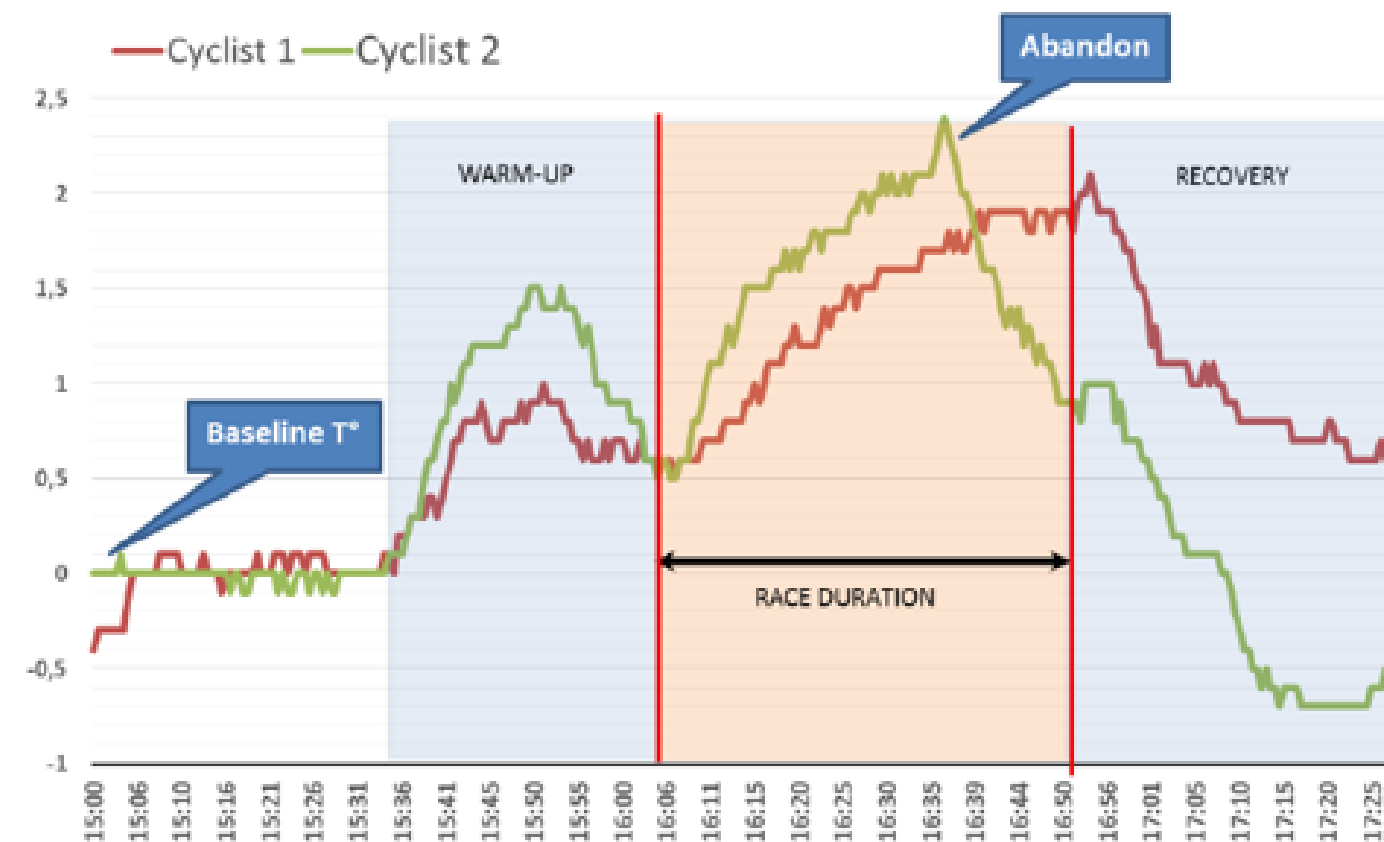
# Examples of research studies

## Warm-up optimization

### eCelsius Performance Connect ADDED VALUE

- 1 Warm-up process assessment
- 2 Individualization of warm-up
- 3 Performance optimization

Core temperature increasing during warm up process must be controlled. Limitation of core temperature rise during warm-up process allows to delay the discomfort and exhaustion associated to hyperthermia.



FDJ pro cycling team, Team Time Trial - World Road Cycling Championship, (Richmond 2015)

### Publications:

Taylor et al., (2019), An ice vest limits the rise in core temperature during a Rugby Sevens warm-up.

Keller et al., (2020) Comparison of two different cooling systems in alleviating thermal and physiological strain during prolonged exercise in the heat.

# Examples of research studies

## Circadian rhythm characterization

### eCelsius Performance Connect ADDED VALUE

- 1 Assessment of individual CBT rhythm
- 2 Individual jet lag resynchronization
- 3 Performance optimization

Circadian synchronization is of main importance for elite athletes. Core temperature is one of the main marker of the individual circadian rhythm. Measuring and monitoring this parameter will be a key element for improving performance and recovery.

#### Publications:

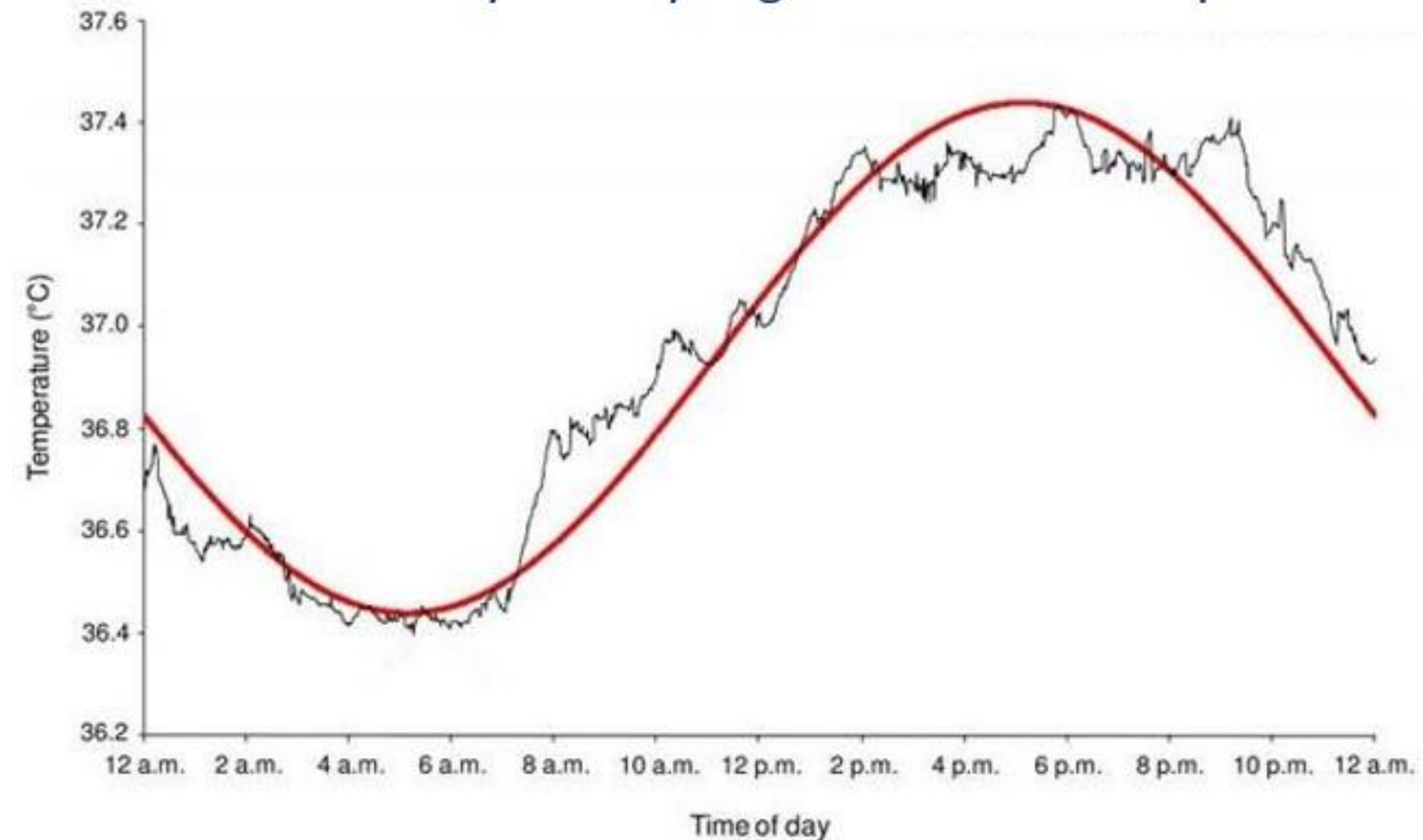
Komarzynski et al., (2019), Predictability of individual circadian phase during daily routine for medical applications of circadian clocks.

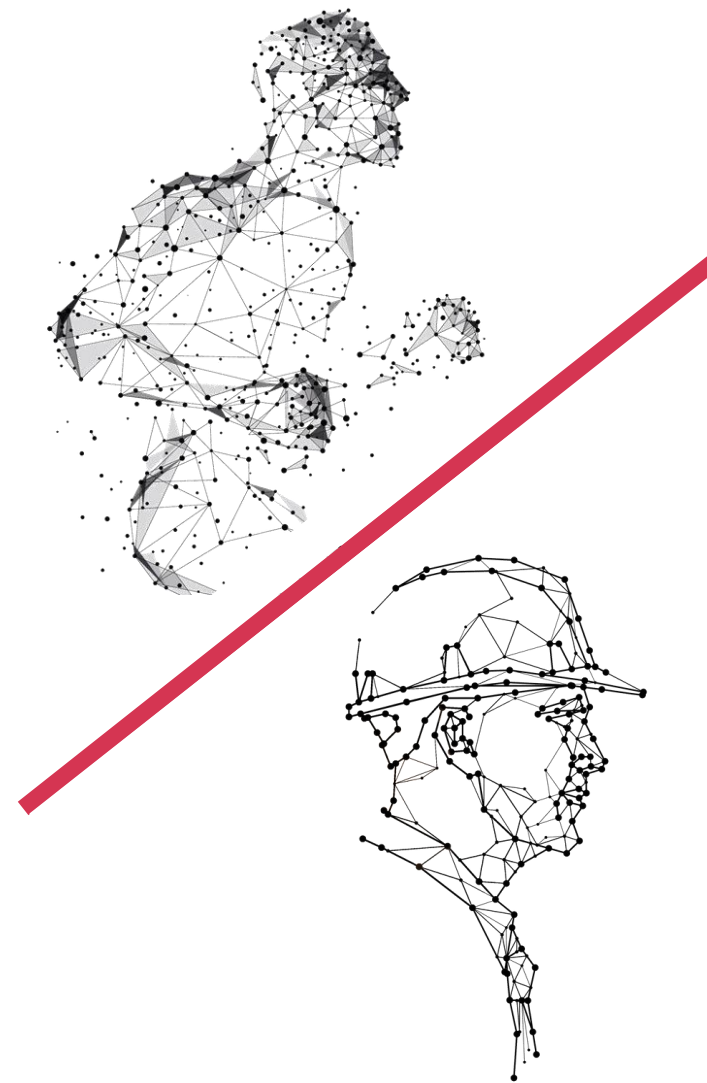
De Blasiis et al., (2019), Photoperiod impact on a sailors =sleep wake rhythm and core body temperature in polar environment.

Dominiak et al., (2020), The effect of a short burst of exercise during the night on subsequent sleep.

Chavineau et al., (2021), Effect of the Depth of Cold ater Immersion on Sleep Architecture and Recovery Among Well-Trained Male Endurance Runners

### Circadian rhythmicity of gastrointestinal temperature





# Reach Out to Us

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