







A system for a reliable and accurate core body temperature data collection

Scientifically validated Gold standard for core body temperature data collection





eCelsius Performance added value

slide 8

Examples of research studies

slide 9-15

Current field applications



Current field applications Few examples



- Improve heat acclimatization process
- Improve performances in harsh environment
- Warm up recovery process optimization
- Performances assessment/optimisation
- Quantifying and avoiding the Jet-Lag issue



APPLICATIONS FOR OCCUPATIONAL HEALTH RESEARCH

• Core body temperature data collection for soldiers • Core body temperature data collection for fireman, rescue divers • Improve physical & cognitive performances in harsh environment



About eCelsius Performance





Introduction eCelsius Performance: the essentials





Activation box to turn on the electronic capsule

Communication range in real time: around 1m (subject & environment depending)



eViewer Performance monitor





ePerformance Manager software



About eCelsius Performance

Specifications

eCelsius Performance ELECTRONIC CAPSULE SPECIFICATIONS

1		
	Electronic capsule cleaning	Standardized cleaning process
	Size (diameter x length)	17.7mm x 8.9mm
	Weight	1.7g
	Temperature accuracy	+/- 0.1°C for subject physiological range 36- 41°C, ±0.13°C outside of the physiological range.
	Temperature resolution	0.01°C
	Life duration	20 days
	Shelf life	2 years
	Measurement period available	15s, 30s, 1min, 2min, 5min
	Temperature range	25°- 45°C (77 - 113°F)





Minimum weight 40kg





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

Equipement

eCelsius Performance ACTIVATOR SPECIFICATIONS:

Able to activate a large number of electronic capsule

eViewer MONITOR SPECIFICATIONS: to visualize and record the data collected

	120mm x 70mm x 15mm
capsules associated	Up to 3 electronic capsules
	150 000 data per electronic capsules
	24/36h

Few parameters may impact the performance of the system:

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

eCelsius Performance added value

Technical specifications:

ELECTRONIC CAPSULE INTERNAL MEMORY

Embedded memory in the electronic capsule allows to continuously store the last 2000 collected data in FIFO mode, and independently of the electronic capsule life duration.



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 the monitor is in the communication range of the electronic capsule, you can collect real time data. If not, the monitor will synchronize the missing data as soon as the electronic capsule and the monitor are back in their communication range.

ADAPTABLE DATA COLLECTION

During the data collection, you have the possibility to change the measurement period at any time. 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.

RELIABLE DATA COLLECTION Accurate data with a resolution of 2 digits.



LIGHTWEIGHT & TINY

Electronic capsule is lightweight 1.7g and measures 17.7mm x 8.9mm.



MEASUREMENT PERIOD

Several sampling frequencies are available and can be changed all along the data collection.



SIMPLE WAY OF WORKING

After activation and ingestion, the electronic capsule automatically collects and transmits accurate and reliable temperature data to the eViewer monitor.



ACCURATE DATA

eCelsius Performance guarantees you an accuracy of +/- 0.1 °C, for subject physiological range 36-41°C, ±0.13°C outside of the physiological range.

Other:



ADD MARKERS

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



DESIGNED FOR SUBJECT

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



Example of research studies





Example of research studies Sport / research purpose

eCelsius Performance ADDED VALUE

Accurate, reliable and continuous core body temperature data collection

Support performances improvement in harsh environment

Equipment, training/recovery processes assessment

Long duration exercises performed in the heat induce rise in core body temperature.



Publications:

2

3

Xu et al., 2021, Effects of Hot and Humid Environments on Thermoregulation and Aerobic Endurance Capacity of Laser Sailors. Racinais et al., 2022, Association between thermal responses, medical events, performance, heat acclimation and health status in male and female elite athletes during the 2019 Doha World Athletics Championship.

Aylwin et al., 2023, Thermoregulatory responses during road races in hot-humid conditions at the 2019 Athletics World Championships.

10

P060BRO001 - eCelsius Performance system Brochure.2 - EN

Example of research studies Performance optimization

eCelsius Performance ADDED VALUE Implementation/control of an acclimatization program Individual control of acclimation process 2 **Benefits assessment** 3

The increase of core body temperature is directly correlated to performances decline. This can be avoided with an individual acclimatization program.



A rise of 0.8°C in core body temperature leads to: • a rise of 25 bpm in submaximal HR • a significant decrease in stroke volume

Publications:

Schmit et al., 2018, Optimizing Heat Acclimation for Endurance Athletes: high versus Low-intensity training. Roussey et al., 2021, Heat acclimation training with intermittent and self-regulated intensity may be used as an alternative to traditional steady state and power-regulated intensity in endurance cyclists.

Galan-Lopez et al., 2023, Heat Preparation and Knowledge at the World Athletics Race Walking Team Championships Muscat 2022.

Example of research studies



This takes the form of differences in thermoregulatory profiles, adaptations and acute physiological responses.

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

Publications:

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. Grossmann et al., 2022, Fluid Balance and Thermoregulatory Responses during Wheelchair Basketball Games in Hot vs. Temperate Conditions.

Example of research studies Cope with harsh environment

eCelsius Performance ADDED VALUE



Assessment of individual resistance to cold temperatures

Core body temperature data collection in all harsh environments (Cold/heat/humidity) allow to assess individual ability to cope with these conditions and therefore avoid thermal risks or a drop in performances.



Publications:

Deng et al., 2020, Effects of local heating on thermal comfort of standing people in extremely cold environments. Melau et al., 2022, Physiological changes following swimming in cold water in triathlon and military operations. Cartwright et al., 2022, Duration limits for exposure for the whole body and extremities with a military extreme cold protection clothing ensemble at an ambient temperature of -40°C.



Example of research studies Warm-up optimization



Core temperature increasing during warm up process has to be controlled. Limitation of core body temperature rise during warm up process allows to delay the discomfort and exhaustion associated to an abnormally high core body temperature.



Publications:

Keller et al., 2020, Comparison of two different cooling systems in alleviating thermal and physiological strain during prolonged exercise in the heat. **Moussalem et al.,2021**, Effect of Phase Change Material Cooling Vests on Body Thermoregulation and Thermal Comfort of Patients With Paraplegia A Human Subject Experimental Study.

Racinais et al. 2021, Hydration and cooling in elite athletes' relationship with performance body mass loss and body temperatures during the Doha 2019 IAAF World Athletics.

Example of research studies Circadian rhythm & characterization



Circadian synchronization is of main importance for elite athletes. Core temperature is one of the main marker of the individual circadian rhythm. Core body temperature circadian rhythm characterization is a key element to optimize performance and recovery.

36.4 36.2

Publications:

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. Hou et al., 2022, Diurnal Circadian Lighting Accumulation Model A Predictor of the Human Circadian Phase Shift Phenotype.

Circadian rhythmicity of gastrointestinal temperature

12 a.m. 2 a.m. 4 a.m. 6 a.m. 8 a.m. 10 a.m. 12 p.m. 2 p.m. 4 p.m. 6 p.m. 8 p.m. 10 p.m. 12 a.m. Time of day





Reach **Out to Us**

Email address

support@bodycap.io

Mailing address

BodyCAP 3 rue du Docteur Laennec 14200 Hérouville Saint-Clair FRANCE

Phone number

+33 (2) 61 53 08 14

Follow us on social media

