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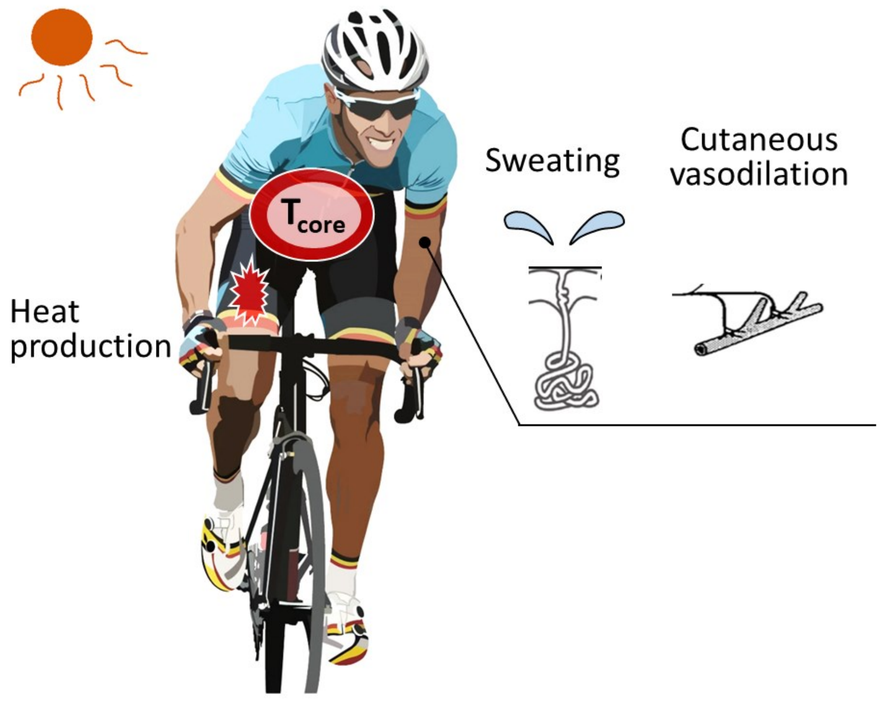
Physiological measurements and products-related interventions during exercise and heat stress in humans

【Keywords】

Sweating	Skin blood flow	thermoregulation	Heat stroke	Cardiovascular

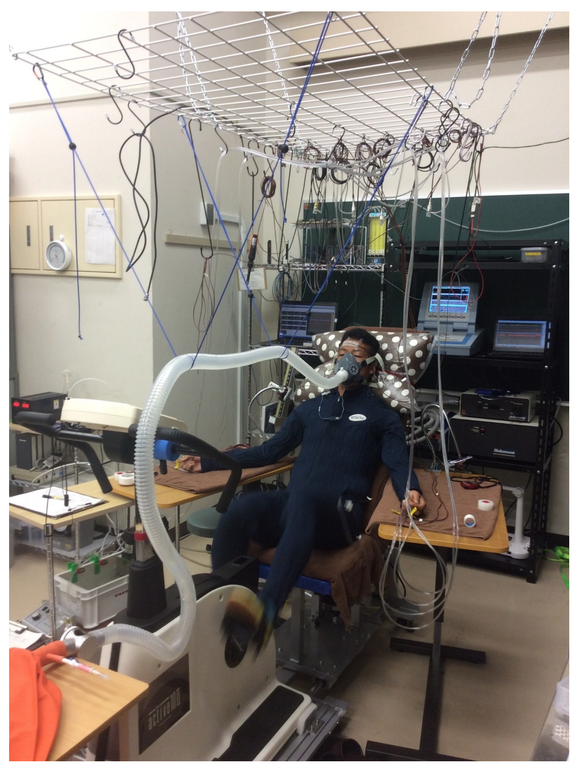
■ Summary

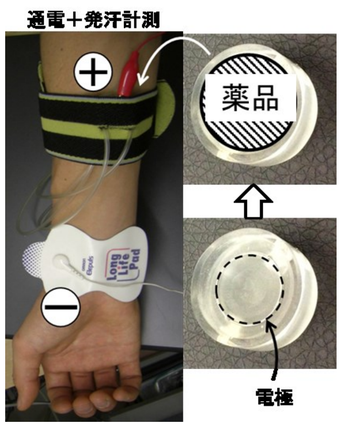
It is well recognized that exercise and heat stress potentially induce hyperthermia and would cause heat-related illness. Sweating and cutaneous vasodilation are primary heat loss pathways in humans and thus understanding these functions is required for preventing heat-related illness. We have been investigated human physiology especially thermoregulation during exercise/heat stress in humans in vivo.



■ Details

Typically we measure core and skin temperatures, local sweat rate, sweat rate per a gland, numbers of activated sweat glands, ion reabsorption in sweat glands, skin and forearm blood flows, oxygen uptake, heart rate, blood pressure, and collecting blood samples (and other variables).





○ Unique technique(s)

- We perform iontophoresis and intradermal microdialysis which are invasive and non-invasive drug delivery techniques into the skin. By using these methods, we have been reported mechanisms of sweating during exercise and heat stress in humans in vivo (see the refs).
- We also evaluate integrative physiological functions in humans

○ Potential applications and future directions

- Elucidating in vivo physiological mechanisms in human, evaluating products such as foods and clothing, enhancing human performance during sports and works, elucidating sweating mechanisms, and developing new devices.

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■ Potential collaboration

- Companies associated with skin care, food, drinks, and any kind of products, as well as working places in the heat (e.g., factory).

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