

# Wearable Body Heating and Cooling System

**A highly efficient, battery-operated, wearable thermoelectric heat pump provides versatile heating and cooling for applications in extreme weather gear, sports medicine, and pain management.**

Researchers at Purdue University have developed an efficient thermoelectric, wearable body heating and cooling system device. Whereas an electric heater only allows for heating, this thermoelectric heat pump provides hot and cold therapy with a higher efficiency. Furthermore, the thermoelectric generator can be operated by rechargeable battery(s) and can be used over several hours. Additionally, this technology can be used in a jacket or a vest in extreme weather conditions by soldiers, first responders, and others working outdoors.

## **Advantages:**

- Wearable
- Efficient
- Battery operated

## **Potential Applications:**

- Sports and Sports Medicine
- Military Thermal Wear
- Cold Therapy
- Pain Reliever
- Vascular Enhancement

**TRL: 3**

## **Intellectual Property:**

Provisional-Patent, 2019-09-03, United States | Utility Patent, 2020-09-03, United States

## **Technology ID**

2019-YAZA-68601

## **Category**

Aerospace & Defense/Advanced  
Protective Materials & Wearable  
PPE

## **Authors**

Bruno Roseguini  
Kazuaki Yazawa

## **Further information**

Dipak Narula  
[dnarula@prf.org](mailto:dnarula@prf.org)

## **View online**



**Keywords:** Wearable body heating, cooling system device, thermoelectric heat pump, hot and cold therapy, thermal wear, battery operated, sports medicine, military thermal wear, cold therapy, pain reliever, Biomedical Engineering, Medical/Health, Wearable Medical Device