Docket #: S20-060

An Integrated Cooling (i-Cool) Textile of Heat Conduction and Sweat Transportation for Personal Perspiration Management

Stanford researchers have created an integrated cooling textile (called i-Cool) with an unique functional design for personal perspiration management (PPM). The novel structural design of i-Cool textiles incorporates lab-proven functionality for PPM: fast water wicking, rapid evaporation, superior cooling effect and suppressed human body dehydration, most of which current textiles do not achieve. An artificial sweating skin platform with feedback control loop simulating human body perspiration situation was realized, on which the i-Cool (Cu) textile shows apparent cooling effect and much less water loss compared to the conventional textiles. Also, the structure advantage maintains under various exercise and ambient environments. The practical application of the i-Cool design principles has also been demonstrated, exhibiting good performance and wearability. This i-Cool textile has the potential to revolutionize next generation textiles for PPM in the near future.

Figure

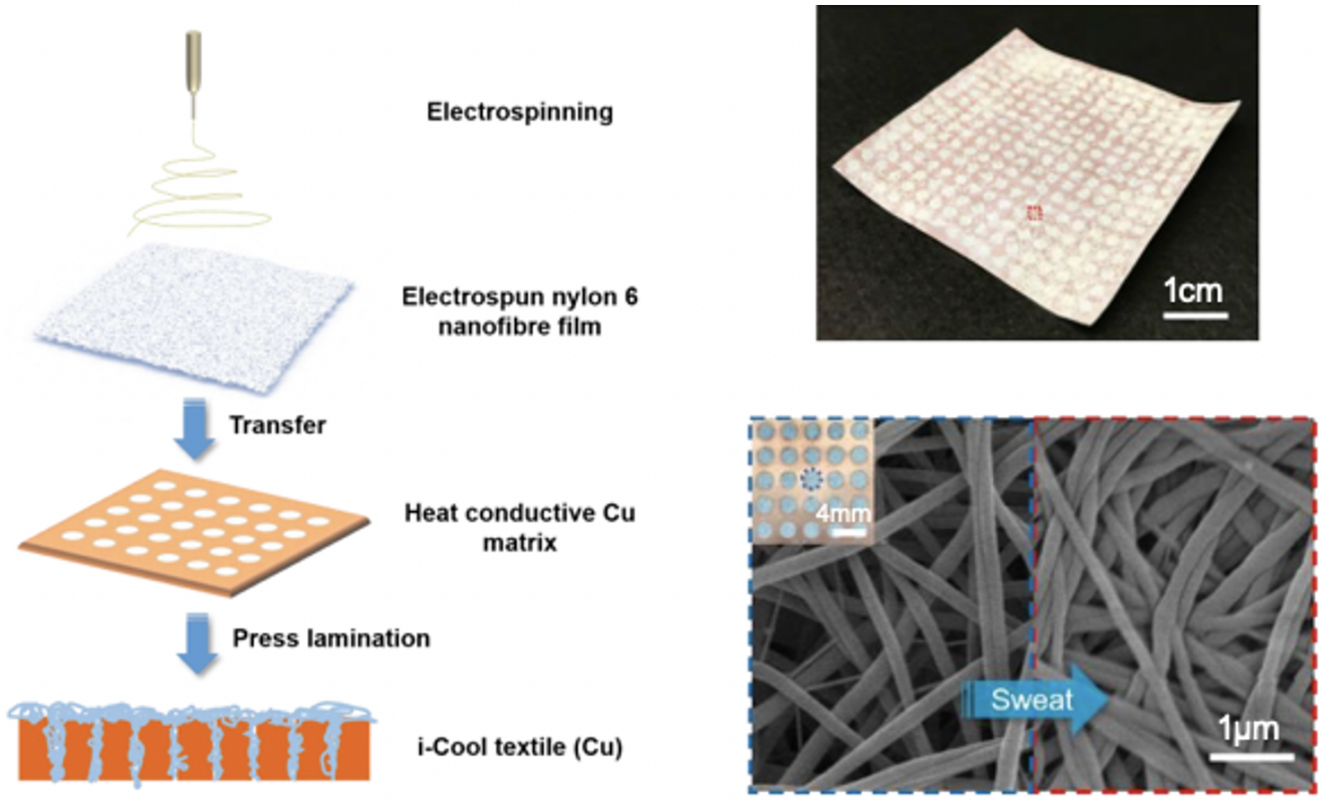


Figure description - Functional Design Structure

Stage of Development

- **Prototype**
- Demonstrated practical application feasibility of the i-Cool textile design principles

Applications

- **Textiles** - Personal perspiration management (PPM)
- Consumer, Military, Industrial uses

Advantages

- **Unique design structure**
- Fast wicking, rapid evaporating sweat, and skin cooling
- **Superior cooling** compared to current products – currently on-textile surfaces can be cooled, not the skin underneath the textile

- **Reduces risk** of dehydration, electrolyte disorder, physical and mental deterioration which can be life threatening

Publications

- Peng, Y., Li, W., Liu, B. et al. Integrated cooling (i-Cool) textile of heat conduction and sweat transportation for personal perspiration management. *Nat Commun* 12, 6122 (2021). https://doi.org/10.1038/s41467-021-26384-8

Patents

- Published Application: 20210402734
- Issued: 12,296,568 (USA)

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