

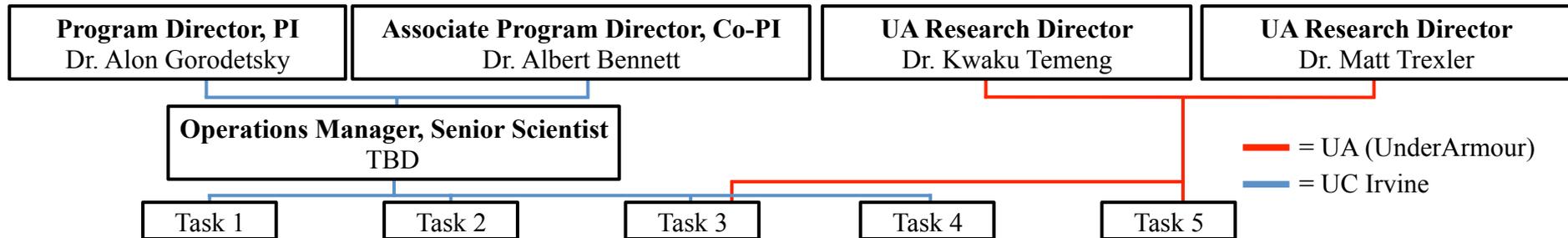
Project Title: Thermocomfort Cloth Inspired by Squid Skin

PI: Alon Gorodetsky

Duration: 4/20/15 - 4/19/18

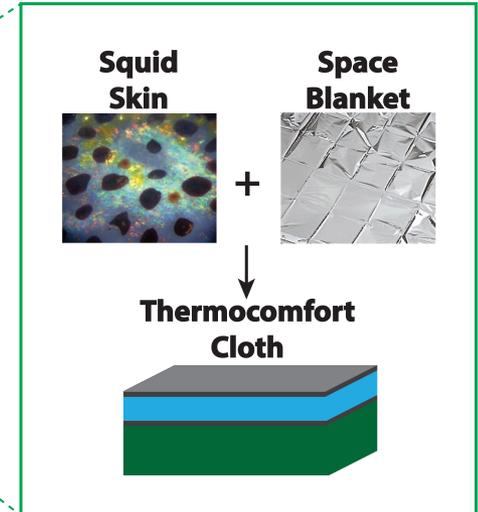
University of California, Irvine

The Members of the Team

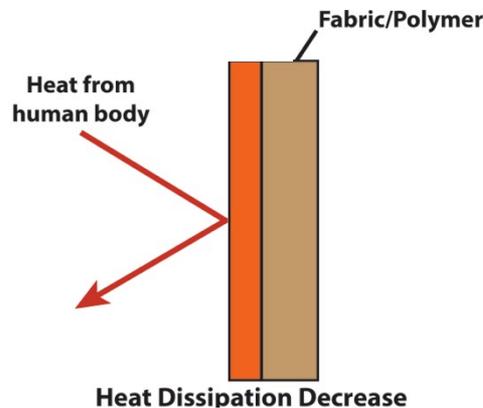


- UC Irvine: Dr. Gorodetsky and Dr. Bennett will direct the development, characterization, and testing of the thermoregulatory devices
 - Dr. Alon Gorodetsky: expertise in nanofabrication and electrical/optical properties of cephalopod-inspired materials
 - Dr. Albert Bennett: expertise in thermal physiology and thermal management
- Under Armour: Dr. Temeng and Dr. Trexler will lead the manufacture of the thermocomfort cloth for garment integration
 - Dr. Kwaku Temeng: expertise in wearable technologies and consumer products
 - Dr. Matthew Trexler: expertise in wearable technologies and consumer products

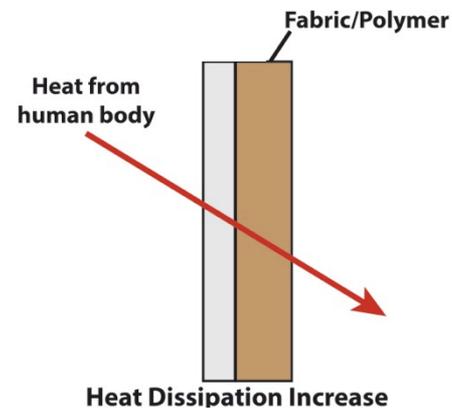
Description of the Technology and the Value Proposition



Cool Thermal Environment



Warm Thermal Environment



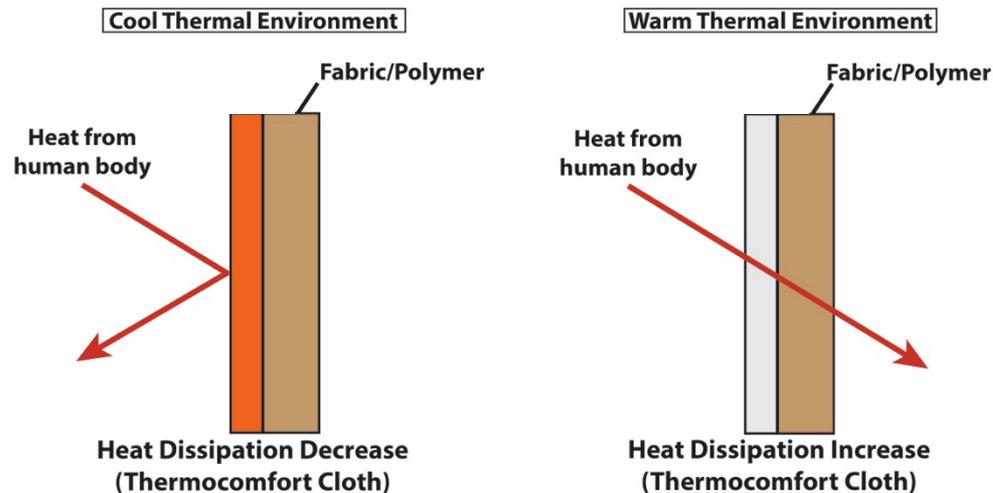
Description of the Technology and the Value Proposition

Figure of Merit	State of the Art	Proposed
Performance	Provide > 23 W	Provide/remove ~ 24 W
COP	>>> 0.35	> 2
Motion Range	Unlimited	Unlimited
Cost	< 10 % increase	< 5 % increase
Safety	Meets OSHA	Meets OSHA
Durability	Not washable	Meets ASTM
Appearance	Limited/uncomfortable	Identical to chosen fabric
Weight	< 10 % increase	< 5 % increase

- The proposed technology is a disruptive fabric/garment that enables dynamic management of personal thermal comfort in indoor settings
- The proposed technology will expand the thermal comfort setpoint by 4°F in each direction, leading to a net 15 % energy cost savings for buildings

The Validation Plan and the Performance Targets

- Major Milestones
 - Year 1: Development of a Dynamic Infrared-Reflecting Material
 - Year 2: Demonstration of Thermal Regulation Capabilities
 - Year 3: Textile Integration and Validation of Functionality for End Users



- Technology benefits will be validated in a controlled laboratory environment as well as on a sweating manikin, with swatches of a thermoregulatory fabric available after 30 months

How the DELTA Community Can Help Our Project

- Question: Does anyone have expertise with materials that reflect in the thermal infrared region?
- Question: Does anyone have expertise with computational modeling of heat transfer in textiles?