Exposure To Heat and Cold

The effectiveness of the regulation of core body temperature (TEMP) depends in part upon the environmental, or ambient, temperature and on the relative humidity in the air. The importance of each of these factors can be investigated by simulating changes in them. Ambient temperature (TEMAB) can be moved away from its default value of 27°C and relative humidity can be controlled by changing it from its default value of 0.3. In today 's brief session we confine ourselves to only to TEMAB changes.

Heat stress and cold stress

1) Use the on-line HUMAN variables list to determine the HUMAN code for each of the physiological variables listed in column #1 below and write them into the spaces in column 2.

2) Simulate heat stress (37°C) first and then, after restarting the model, cold stress(15°C). In each case, fill in the appropriate column in the table below. Pick a representative time to take your values at (e.g. hour 1 or hour 2 or your choice). (sample 1 hr. protocol – a) Get 15 deg. values at 1hour (run for 1h, 1H between printouts) -> Start Over b) Get 37 deg. values at 1 hour (run for 1H, 1h between printouts)

Ambient Temp.	**TEMAB**	27°C	15°C	37°C
Body Temperature	_____	_____	_____	_____
Calories Produced	_____	_____	_____	_____
Sweat Volume(/min.)	_____	_____	_____	_____
Skin Blood Flow	_____	_____	_____	_____
Shivering	_____	_____	_____	_____
Muscle Flow	_____	_____	_____	_____
Sympathetic Activity	_____	_____	_____	_____

Body temperature regulation requires a balancing of heat exchange gains and losses and therefore the manipulation of the various routes of potential gain & loss (heat fluxes). Apply this conceptual framework to the question below.

Below and on the back describe BRIEFLY the role of each of the seven variables/ mechanisms in the above experiment as they contribute to the homeostatic response to a decrease(*or* increase) in ambient temperature, supporting your reasoning for each variable from your data.