

Condensed Chromatin, Cell Thermoregulation and Human Body Heat Conductivity

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ABSTRACT Earlier we put out a proposal on possible participation of condensed chromatin (CC) in cell thermoregulation; CC being the densest domain in a cell, apparently conducts heat between the cytoplasm and nucleus when there is difference in temperature between them. This hypothesis can be checked at the level of cells or organisms. Experimentally we have managed to establish that at the level of organisms there is a broad intra population variability of human body heat conductivity (BHC). It is shown that these individual differences in the BHC are attributed to the amount of chromosomal Q-heterochromatin regions (Q-HRs) in their genome. It is assumed that, possibly, the biological role of the Q-HRs in the interphase nucleus of the cell is in intensification of the CC compacting thus increasing its heat conductivity (HC). On the HC of CC, correspondently on the amount of Q-HRs in the genome, depends the speed of leveling the difference of temperature between the cytoplasm and nucleus, i.e. the cell thermoregulation. From the HC of the cells the HC of the whole body is made up. This is a physical condition, where the physiological thermoregulation is realized, which is assigned for keeping relative temperature constancy in the inner medium of the organism by leveling the temperature difference in different parts of the body.