

### **35.Dynamic changes in intracapillary hemoglobin oxygenation in human skin following various temperature changes.**

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To evaluate microvascular regulation in human skin, changes in intracapillary hemoglobin oxygen saturation (HbO<sub>2</sub>) were studied in human finger skin following an abrupt change in local ambient temperature. In the first series of experiments, we assessed the heterogeneity of HbO<sub>2</sub> in the skin by using a 2-D scanning system and a rapid micro-lightguide spectrophotometer at each of two near-normal skin temperatures. The data showed that heterogeneous oxygenation exists in human skin even at near-normal temperatures (although the pattern is different at different skin temperatures). In a second series of experiments, the performance of the microcirculation of the skin was continuously examined in a selected area with initially different oxygenation levels during an abrupt change in local ambient temperature (5, 15, 25, 35, and 45 degrees C). At very low (5 degrees C) or very high (45 degrees C) temperatures, oxygenation in tissues within the low HbO<sub>2</sub> area increased greatly, but there was no such change within the high HbO<sub>2</sub> area. Our data indicate that different types of capillary supply units exist in human skin (indicated by the initially different oxygenation levels). These different capillary supply units may operate to produce a local redistribution of flow between the various capillary supply units. This effect may be initiated by heat sensors and oxygen sensors when temperature of the skin is varied. Copyright 1998 Academic Press.

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