## INTRODUCTION

Autoregulation is a compensatory mechanism in the microcirculation that helps maintain tissue blood flow despite changes in arterial perfusion pressure. It is critical for the maintenance of tissue oxygenation, especially in organs such as the brain and heart, where metabolic processes are highly dependent on a constant supply of oxygen. Failure of autoregulation can lead to tissue hypoxia and, in severe cases, organ dysfunction.

### Methods

**NIRS-based Quantitative Measurement of Autoregulatory Effects on Microvascular Hemoglobin Oxygenation:**

- **Objective:** Assess differences in hemoglobin oxygenation between non-diabetic and type II diabetic subjects.
- **Technique:** Near-infrared spectroscopy (NIRS) was used to measure changes in microvascular hemoglobin oxygenation.
- **Procedure:** Subjects underwent a series of tasks including Reactive Hyperemia and baseline periods.
- **Data Analysis:** Differences in hemoglobin concentrations were quantified using predefined metrics.

### Results

- **Healthy Controls (HC):**
  - Reaction time differences were observed between HC and DM2 subjects.
  - Hemoglobin oxygenation was generally maintained in HC subjects, indicating effective autoregulation.
- **Type II Diabetes Mellitus (DM2):**
  - Hemoglobin oxygenation showed a reduced response to reactive hyperemia compared to HC.
  - Autoregulatory dysregulation was more pronounced in DM2, indicating impaired autoregulation.

### Conclusions

- **Statistical Significance:**
  - Hemoglobin oxygenation differences were statistically significant between HC and DM2.
  - The study highlights the importance of autoregulation in diabetes management.

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