

## Diagnosing endothelial dysfunction to prevent cardiovascular diseases

### KEYWORDS

- Nitric oxide
- Hemoglobin
- Prevention

### The Market:

#### Cardiovascular diseases prevention

There is an urgent need for a satisfying biomarker to improve risk stratification of patients with silent vascular disease and so prevent an evolution towards a cardiovascular disorder.

The quantitative measurement of nitric oxide bioavailability in vasculature is a novel biomarker of endothelial function will be useful for:

- Vascular endothelial dysfunction-related **diseases**
- **Treatment** tailoring and personalized medicine

Assessing the efficacy of **clinical trials** and so improving the safety and clinical utility of new drugs

### The expertise

UCL researchers have set up and validated an efficient process to stabilize and quantify the reaction product of hemoglobin and nitric oxide in erythrocytes *in vivo*. The paramagnetic  $\alpha$ -HbNO complex is measured by Electron Paramagnetic Resonance (EPR) spectroscopy.

Measured  $\alpha$ -HbNO levels were strongly correlated with endothelial function. The test was **clinically validated** in cohorts of healthy volunteers or patients with metabolic syndrome. Significant correlations of  $\alpha$ -HbNO levels were established with traditional cardiovascular risk factors, such as the Body Mass Index, levels of glycated hemoglobin, non-HDL cholesterol or triglycerides.

### Advantages & applications

- ✓ Direct measurement of the bioavailability of NO, the “guardian angel” of vascular homeostasis
- ✓ Direct and quantitative measurement of bioactive radicals
- ✓ Surrogate biomarker in interventional clinical studies to test efficacy of cardiovascular treatments
- ✓ Biomarker for treatment tailoring, e.g. to guide dosage of medications with vascular toxicity or NO donors

