

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 α -HbNO complex is measured by Electron Paramagnetic Resonance (EPR) spectroscopy.

Measured α -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 α -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

