

***Diabetes, Hypertension and Cancer Metastasis-induced Changes in Endothelium Studied with 3D Raman and AFM Imaging***

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The endothelium, a unicellular layer lining blood vessels, is a major player controlling vascular tone, blood pressure, platelet activation, thrombosis and inflammation. Maladaptive alterations of these mechanisms that occur in endothelial dysfunction leads to many diseases including type 2 diabetes, hypertension and cancer metastasis.

Due to a very small thickness of endothelium (in humans its thickness varies from less than 0.1  $\mu\text{m}$  in capillaries and veins to 1  $\mu\text{m}$  in the aorta[1]), a proper methodology is necessary to visualize and analyse changes occurring in endothelial cells upon pathology developments. In this work, 3D Raman and AFM imaging-based approach was used to investigate pathological changes in the endothelium in murine models of the above-mentioned pathologies.[2-3]

Endothelial dysfunction manifested on the biochemical level in a very different ways for studied diseases. Still in every case resulted in considerable chemical alterations in the vessel wall of animals with developed pathology compared to the control. These chemical changes, analysed in detail in this work, might be a base for future *in vivo* diagnosis based on the identification of the biochemical status of endothelium by Raman-AFM combined approach.

#### References

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