Head and neck cancers (HNSCC) are heterogeneous group of tumours. Risk factors are mainly smoking and alcohol consumption. Some of these tumours are associated with human papillomavirus (HPV) infection, which is a significant positive prognostic factor. These tumours differ from HPV-negative tumours in clinicopathological characteristics, tumour microenvironment and response to treatment. Hypoxia is commonly found in tumors including HNSCC and is a significant prognostic and predictive factor. Elucidating the degree of hypoxia in relation to HPV infection could partly explain the differences in prognosis of these patients and allow more appropriate choice of therapy. Aspartate-β-hydroxylase is also a significant negative prognostic factor in a number of tumours, but its role in HNSCC has not yet been investigated.

I focused on the detection of hypoxic markers and aspartate-β-hydroxylase expression in samples from HNSCC patients at the mRNA level by quantitative PCR and at the protein level by multispectral immunohistochemistry. The expression levels of these markers were compared in tumors stratified according to viral etiology and other characteristics such as smoking, localization or tumor stage. HPV infection had the highest impact on the expression of these markers, but the results cannot point to a higher level of hypoxia in one of these tumor groups. This work expands the knowledge of hypoxic markers expression in HNSCC of different etiologies.