# Molecular biology of renal tumours in clinical use

**MUDr. Ivan Trávníček**

## Summary

**Aim:** To identify tissue biomarker that are predictive of the therapeutic effect of sunitinib in treatment of metastatic clear cell renal cell carcinoma (mCRCC).

**Material and methods:** Our study included 39 patients with mCRCC; these were selected from 119 patients who received sunitinib in our hospital between the years 2005 – 2012 according to inclusion criteria of the study. Patients were stratified into two groups based on their response to sunitinib treatment; non-responders (progression), and responders (stable disease, regression). The effect of treatment was measured by comparing imaging studies performed before the initiation of treatment, with those done between 3$^{rd}$ and 7$^{th}$ months of treatment. Histological samples of tumour tissue and healthy renal parenchyma, acquired during surgery of the primary tumour, were examined with immunohistochemistry to detect tissue biomarkers (mTOR, p53, VEGF, HIF1, HIF2, CAIX). The average levels of biomarker expression in both, tumour tissue, as well as in healthy renal parenchyma were compared between the two groups of patients. Results were evaluated using Student´s T-test.

**Results:** When considering the results of the group of responders, statistically significant differences in marker expression in tumour tissue versus healthy parenchyma were found for mTOR (4% vs. 16.7%; p=0,01031), p53 (4% vs. 12,7%; p=0,042019), VEGF (62,7% vs. 45%; p=0,019836) and CAIX (45% vs. 15,33%; p=0,001624). A further significant difference was found in the frequency of high expression (more than 60%) between tumour tissue and healthy parenchyma in VEGF (65% vs. 35%; p=0,026487) and CAIX (42% vs. 8%; p=0,003328). In the group of non-responders, a statistically significant difference was evident in p53 a VEGF expression in tumour versus healthy tissue (3% vs. 21.3%; p=0,02824 resp. 36.3% vs. 12%; p=0,011921).

**Conclusion:** A significantly higher expression of VEGF in CRCC in comparison to healthy parenchyma, can predict a better response to sunitinib. On the other hand, the high expression of VEGF in healthy renal parenchyma can predict worse response to treatment.