

# Correlation of Angiogenic Markers in Neuroendocrine Tumors and Their Prognostic Implications

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**Background:** Neuroendocrine tumors (NETs) are rare and indolent neoplasms. Two markers, CD31 and Factor VIII, describe the angiogenicity of a tumor and may correlate with tumor growth and metastasis. We hypothesized that these two angiogenic markers are highly correlated. Tumors with higher angiogenic markers may have higher proliferative indices (Ki-67) and poorer prognoses.

**Methods:** Pathology reports from all NET patients who had surgery performed at our institution from April 2003 to October 2014 were queried for Factor VIII, CD31 and Ki-67 immunohistochemical values. Patient demographics, tumor characteristics and pathology reports were analyzed. For subjects with multiple values, the highest value was used in statistical calculations. Survival from date of diagnosis was calculated via Kaplan-Meier method and statistical significance was defined as  $p < 0.05$ .

**Results:** One-thousand and seventy-two specimens from 534 NET patients were analyzed. CD31 and Factor VIII were statistically significantly correlated ( $p < 0.0001$ ;  $r = 0.8663$ ). When individually compared to Ki-67, CD31 and Factor VIII showed no statistical association ( $p = \text{NS}$ ). Survival sorted by Ki-67 was statistically significant ( $p < 0.05$ ). However, survival, stratified by CD31 and Factor VIII, was not statistically significant ( $p = \text{NS}$ ).

**Conclusion:** Factor VIII and CD31 in NETs are significantly correlated regardless of primary tumor site, and high values do not predict a poor prognosis. Further studies are warranted to determine the role of these markers in the diagnosis and management of NETs.