

Supplementary Methods

VHL mutation analysis

Tumors were assessed for *VHL* mutation status by amplifying and sequencing all three exons. PCR was performed using the Taq PCR Core Kit (Qiagen, Germantown, MD), and products were sequenced bidirectionally using Big Dye Terminator v.1.1 (Applied Biosystems, Foster City, CA) according to manufacturer's specifications and run on an ABI 3130x1 Genetic Analyzer.

The VHL primer sequences are:

VHL 1F: AAGACTACGGAGGTCGACTC

VHL 1R: CTCAGACCGTGCTATCGTC

VHL 2F: ATCTCCTGACCTCATGATCCG

VHL 2R: ATCCTGTACTIONACCACAACAAC

VHL 3F: CCATCAGTAGTACAGGTAGTTGT

VHL 3R: TGAGAATGAGACACTTTGAAAC