BLADDER CANCER

Normal urothelium

Hyperplasia

Low-grade
non-invasive
urothelial tumor

CIS hyperplasia

Invasive tumor
(high-grade)

Metastasis

Urothelial cell

MAPK signaling pathway

Genetic alterations
Carcinogens: HRAS, P53, F3
Tumor suppressors: CDKN2A, p53, Rb

p53 signaling pathway

p73 signaling pathway

VEGF signaling pathway

DNA methylation

Cell cycle

DNA → OHS progression

Angiogenesis

Endothelial cell proliferation

Degradation of extracellular matrix

Endothelial cell migration

Chemotaxis of endothelial cells

Elastase

Adhesion molecules

Tumor progression

Glioblastoma