CESC - Cervical squamous cell carcinoma

Subtype	Biology & Expression	Genomic Alterations	Clinical Features
Keratin-high Squamous	• Very high keratin (KRT1/5/6/14) and cornification gene expression (SPRR family) • Strong squamous differentiation; low immune signature	• Enriched **PIK3CA** and **NFE2L2** mutations • **ARID1A** alterations • Predominantly HPV-16 infections	• Almost exclusively squamous histology • HPV-16-positive • Standard chemoradiation sensitivity • No distinct survival difference from other clusters
Keratin-low Squamous	• Lower keratin expression • Enriched immune/inflammatory (cytokine, HLA) and EMT/ECM-remodeling programs	• Enriched **ERBB3**, **CASP8**, **HLA-A**, **TGFBR2** mutations • HPV-18/45 enrichment	• Squamous histology • Higher immune-cell infiltration ("immune-hot") —potential immunotherapy candidates • Similar overall survival to keratin-high
Adenocarcinoma-rich	• High glandular/endometrioid and mucinous marker expression (MUCs, FOXA2) • Hormone-receptor and CIMP-high phenotype	• Frequent **KRAS**, **ARID1A**, **PTEN**, **PIK3CA** mutations • Low HPV integration; some **TP53** mutations	• Predominantly adenocarcinoma histology (often HPV-negative) • Older age at diagnosis • Similar prognosis to squamous clusters • May benefit from PI3K/AKT-targeted