PROTEOGLYCANS IN CANCER Hep aran sulfate proteoglycans (HSPGs) Hyaluronan (HA) Shedding MAPK signaling pathway Angiogenesis DNA -► Cytoskeleton activation= COLA I K06256 Cytoskeleton activation (HSPG) (Ovarian tumor cells) E Cell adhension and spreading ERK2 K06257 (HSPG) Regulation of actin cytoskeleton Adherens junction PI3K-Akt signaling pathway Cell migration and invasion Cytoskeleton activation (Ovarian tumor cells) —— Proliferation and survival Oncogenic signaling MAPK signaling pathway Wnt signaling pathway Proliferation and survival Acidic pH — — ECM degradation enzyme activation K06256 (Breast tumor cells) → Cytoskeleton activation — — → Cell migration - 🕶 Stress fibers formation Calcuim signaling pathway K05717 ERM family Focal adhesion Lipid Raft Tumor cell migration and invasion —► Cytoskeleton activation —————— K05763 (Lewis lung carcinoma cells) rearrangement 🐣 Cytoskeleton rearrangement Cell adhension (Head and neck squamous tumor cells) Cell growth and survival DNA Proliferation and survival Cell growth and survival DNA K16338 **→** PKCα (HSPG) K16867 Cell migration and invasion K09295 Tumor cell migration and invasion K05717 K06484... Chondroitin sulfate/ Dermatan sulfate proteoglycan (CSPG/DSPG) mTOR signaling pathway ► Translation — ► Proliferation and survival (Pancreatic cancer cells) Proliferation and survival (HSPG) Apoptosis 🚁 EGFR C-termius degradation TGF-beta signaling pathway CS 🔿 (Hepatocellular carcinomas) MAPK / Erk, p38 singaling ———► Growth suppression **∴Ç**26 Wnt signaling pathway K03209... DS Endosome — → GPC3, Hh degradation — — HIF-1 signaling pathway VEGF signaling pathway Hh signaling pathway -► O \_\_ — — 🟲 Reduced signal Matrix bound K05448 ——————► Inhibiton of cell migration, proliferation and survival Keratan sulfate proteoglycan (KSPG) (Bone tumor cells) K06255 - 🟲 Inhibition of angiognesis Apoptosis Apoptosis K06255 (HSPG) K08122 TGF-beta sigaling pathway **O** KS Growth suppression O HS Cell migration, proliferation and survival, vascular permeability -\_<del>+p</del>\_►Smad 2 K13376 —⊳(VEGF signaling pathway K05448 05205 10/23/15 (c) Kanehisa Laboratories