SPHINGOLIPID SIGNALING PATHWAY Endoplasmic reticulum Golgi Palmitoyl CoA SM 04 Cer dhSph dhCer ි**ල**5 K04712 Serine Sphingolipid metabolism K03156 K03158 K18953 K12351 Ionizing radiation $\mathbf{\varphi}_{\text{SM}}$ K12350 K03171 0 Ò_{Cer} Lysosome ROS Lysosome K08089... K03173 K05703 Ag Cer O K01379 K04726 K08091 K04426 K02159 Apoptosis K00922... K04441 Adenosine OPIP3 Sph K04456 K18952 K02161 K01115 K04265... K04630 Bradykinin -p K04451 K04716... 0 K05858 Opioids K04371 K01634 K05665 **+**0 MAPK signaling pathway Phospho-ethanolamine S1P Cell survival K04288 Proliferation K04630 Vasodilatation K04292 K00922.. K04456 Cardioprotection NO PI3K-Akt signaling pathway Migration and other cytoskeletal events K04634 K04290 K05858 Secretion IP3 0 K02677... K04293 DG K01110 . Stress-fiber formation K04295 K04513 K04514... K02580... 04071 10/23/15 (c) Kanehisa Laboratories