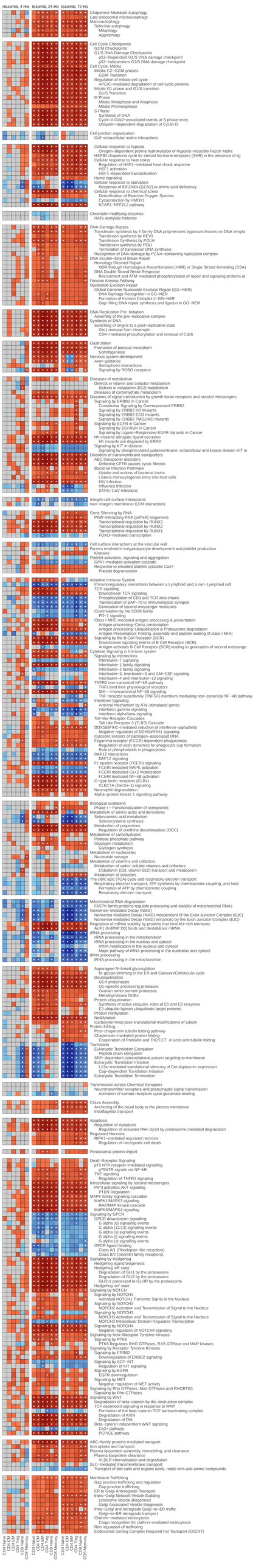
rtezomib, 4 Hoi
tezomib, 24 Ho
tezomib, 72 Ho
Chaperone Mediated Autophagy
Late endosomal microautophagy
Macroautophagy
Selective autophagy
Mitophagy
Aggrephagy
Cell Cycle Checkpoints
G2/M Checkpoints
G1/S DNA Damage Checkpoints
p53−Dependent G1/S DNA damage checkpoint
p53−Independent G1/S DNA damage checkpoint
Cell Cycle, Mitotic
Mitotic G2−G2/M phases
G2/M Transition
Regulation of mitotic cell cycle
APC/C−mediated degradation of cell cycle proteins
Mitotic G1 phase and G1/S transition
G1/S Transition
M Phase
Mitotic Metaphase and Anaphase
Mitotic Prometaphase
S Phase
Synthesis of DNA
Cyclin A:Cdk2−associated events at S phase entry
Ubiquitin−dependent degradation of Cyclin D
Cell junction organization
Cell−extracellular matrix interactions
Cellular response to hypoxia
Oxygen−dependent proline hydroxylation of Hypoxia−inducible Factor Alpha
HSP90 chaperone cycle for steroid hormone receptors (SHR) in the presence of lig
Cellular response to heat stress
Regulation of HSF1−mediated heat shock response
HSF1 activation
HSF1−dependent transactivation
Heme signaling
Cellular response to starvation
Response of EIF2AK4 (GCN2) to amino acid deficiency
Cellular response to chemical stress
Detoxification of Reactive Oxygen Species
Cytoprotection by HMOX1
KEAP1−NFE2L2 pathway
Chromatin modifying enzymes
HATs acetylate histones
DNA Damage Bypass
Translesion synthesis by Y family DNA polymerases bypasses lesions on DNA templa
Translesion synthesis by REV1
Translesion Synthesis by POLH
Translesion synthesis by POLI
Termination of translesion DNA synthesis
Recognition of DNA damage by PCNA−containing replication complex
DNA Double−Strand Break Repair
Homology Directed Repair
HDR through Homologous Recombination (HRR) or Single Strand Annealing (SSA)
DNA Double Strand Break Response
Recruitment and ATM−mediated phosphorylation of repair and signaling proteins at
Fanconi Anemia Pathway
Nucleotide Excision Repair
Global Genome Nucleotide Excision Repair (GG−NER)
DNA Damage Recognition in GG−NER
Formation of Incision Complex in GG−NER
Gap−filling DNA repair synthesis and ligation in GG−NER
DNA Replication Pre−Initiation
Assembly of the pre−replicative complex
Synthesis of DNA
Switching of origins to a post−replicative state
Orc1 removal from chromatin
CDK−mediated phosphorylation and removal of Cdc6
Gastrulation
Formation of paraxial mesoderm
Somitogenesis
Nervous system development
Axon guidance
Semaphorin interactions
Signaling by ROBO receptors
Diseases of metabolism
Defects in vitamin and cofactor metabolism
Defects in cobalamin (B12) metabolism
Diseases of carbohydrate metabolism
Diseases of signal transduction by growth factor receptors and second messengers
Signaling by ERBB2 in Cancer
Constitutive Signaling by Overexpressed ERBB2
Signaling by ERBB2 KD Mutants
Signaling by ERBB2 ECD mutants
Signaling by ERBB2 TMD/JMD mutants
Signaling by EGFR in Cancer
Signaling by EGFRvIII in Cancer
Signaling by Ligand−Responsive EGFR Variants in Cancer
Hh mutants abrogate ligand secretion
Hh mutants are degraded by ERAD
Signaling by KIT in disease
Signaling by phosphorylated juxtamembrane, extracellular and kinase domain KIT m
Disorders of transmembrane transporters
ABC transporter disorders
Defective CFTR causes cystic fibrosis
Bacterial Infection Pathways
Uptake and actions of bacterial toxins
Listeria monocytogenes entry into host cells
HIV Infection
Influenza Infection
SARS−CoV Infections
Integrin cell surface interactions
Non−integrin membrane−ECM interactions
Gene Silencing by RNA
PIWI−interacting RNA (piRNA) biogenesis
Transcriptional regulation by RUNX3
Transcriptional regulation by RUNX1
Transcriptional regulation by RUNX1
FOXO−mediated transcription
Cell surface interactions at the vascular wall
Factors involved in megakaryocyte development and platelet production
Kinesins
Platelet activation, signaling and aggregation
GPVI−mediated activation cascade
Response to elevated platelet cytosolic Ca2+
Platelet degranulation
Adaptive Immune System
Immunoregulatory interactions between a Lymphoid and a non−Lymphoid cell
TCR signaling
Downstream TCR signaling
Phosphorylation of CD3 and TCR zeta chains
Translocation of ZAP−70 to Immunological synapse
Generation of second messenger molecules
Costimulation by the CD28 family
PD−1 signaling
Class I MHC mediated antigen processing & presentation
Antigen processing−Cross presentation
Antigen processing: Ubiquitination & Proteasome degradation
Antigen Presentation: Folding, assembly and peptide loading of class I MHC
Signaling by the B Cell Receptor (BCR)
Downstream signaling events of B Cell Receptor (BCR)
Antigen activates B Cell Receptor (BCR) leading to generation of second messenge
Cytokine Signaling in Immune system
Signaling by Interleukins
Interleukin−7 signaling
Interleukin−1 family signaling
Interleukin−2 family signaling
Interleukin−3, Interleukin−5 and GM−CSF signaling
Interleukin−4 and Interleukin−13 signaling
TNFR2 non−canonical NF−kB pathway
TNFs bind their physiological receptors
NIK−−>noncanonical NF−kB signaling
TNF receptor superfamily (TNFSF) members mediating non−canonical NF−kB pathway
Interferon Signaling
Antiviral mechanism by IFN−stimulated genes
Interferon gamma signaling
Interferon alpha/beta signaling
Toll−like Receptor Cascades
Toll Like Receptor 3 (TLR3) Cascade
DDX58/IFIH1−mediated induction of interferon−alpha/beta
Negative regulators of DDX58/IFIH1 signaling
Cytosolic sensors of pathogen−associated DNA
Fcgamma receptor (FCGR) dependent phagocytosis
Regulation of actin dynamics for phagocytic cup formation
Role of phospholipids in phagocytosis
DAP12 interactions
DAP12 signaling
Fc epsilon receptor (FCERI) signaling
FCERI mediated MAPK activation
FCERI mediated Ca+2 mobilization
FCERI mediated NF−kB activation
C−type lectin receptors (CLRs)
CLEC7A (Dectin−1) signaling
Neutrophil degranulation
Alpha−protein kinase 1 signaling pathway
Biological oxidations
Phase I − Functionalization of compounds
Metabolism of amino acids and derivatives
Selenoamino acid metabolism
Selenocysteine synthesis
Metabolism of polyamines
Regulation of ornithine decarboxylase (ODC)
Metabolism of carbohydrates
Pentose phosphate pathway
Glycogen metabolism
Glycogen synthesis
Metabolism of nucleotides
Nucleotide salvage
Metabolism of vitamins and cofactors
Metabolism of water−soluble vitamins and cofactors
Cobalamin (Cbl, vitamin B12) transport and metabolism
Metabolism of cofactors
The citric acid (TCA) cycle and respiratory electron transport
Respiratory electron transport, ATP synthesis by chemiosmotic coupling, and heat
Formation of ATP by chemiosmotic coupling
Respiratory electron transport
Mitochondrial RNA degradation
FASTK family proteins regulate processing and stability of mitochondrial RNAs
Nonsense−Mediated Decay (NMD)
Nonsense Mediated Decay (NMD) independent of the Exon Junction Complex (EJC)
Nonsense Mediated Decay (NMD) enhanced by the Exon Junction Complex (EJC)
Regulation of mRNA stability by proteins that bind AU−rich elements
AUF1 (hnRNP D0) binds and destabilizes mRNA
rRNA processing
rRNA processing in the mitochondrion
rRNA processing in the nucleus and cytosol
rRNA modification in the nucleus and cytosol
Major pathway of rRNA processing in the nucleolus and cytosol
tRNA processing
tRNA processing in the mitochondrion
Asparagine N−linked glycosylation
N−glycan trimming in the ER and Calnexin/Calreticulin cycle
Deubiquitination
UCH proteinases
Ub−specific processing proteases
Ovarian tumor domain proteases
Metalloprotease DUBs
Protein ubiquitination
Synthesis of active ubiquitin: roles of E1 and E2 enzymes
E3 ubiquitin ligases ubiquitinate target proteins
Protein methylation
Neddylation
Carboxyterminal post−translational modifications of tubulin
Protein folding
Post−chaperonin tubulin folding pathway
Chaperonin−mediated protein folding
Cooperation of Prefoldin and TriC/CCT in actin and tubulin folding
Translation
Eukaryotic Translation Elongation
Peptide chain elongation
SRP−dependent cotranslational protein targeting to membrane
Eukaryotic Translation Initiation
L13a−mediated translational silencing of Ceruloplasmin expression
Cap−dependent Translation Initiation
Eukaryotic Translation Termination
Transmission across Chemical Synapses
Neurotransmitter receptors and postsynaptic signal transmission
Activation of kainate receptors upon glutamate binding
Cilium Assembly
Anchoring of the basal body to the plasma membrane
Intraflagellar transport
Apoptosis
Regulation of Apoptosis
Regulation of activated PAK−2p34 by proteasome mediated degradation
Regulated Necrosis
RIPK1−mediated regulated necrosis
Regulation of necroptotic cell death
Peroxisomal protein import
Death Receptor Signaling
p75 NTR receptor−mediated signalling
p75NTR signals via NF−kB
TNF signaling
Regulation of TNFR1 signaling
Intracellular signaling by second messengers
PIP3 activates AKT signaling
PTEN Regulation
MAPK family signaling cascades
MAPK1/MAPK3 signaling
RAF/MAP kinase cascade
MAPK6/MAPK4 signaling
Signaling by GPCR
GPCR downstream signalling
G alpha (q) signalling events
G alpha (12/13) signalling events
G alpha (s) signalling events
G alpha (i) signalling events
G alpha (z) signalling events
GPCR ligand binding
Class A/1 (Rhodopsin−like receptors)
Class B/2 (Secretin family receptors)
Signaling by Hedgehog
Hedgehog ligand biogenesis
Hedgehog 'off' state
Degradation of GLI1 by the proteasome
Degradation of GLI2 by the proteasome
GLI3 is processed to GLI3R by the proteasome
Hedgehog 'on' state
Signaling by NOTCH
Signaling by NOTCH1
Activated NOTCH1 Transmits Signal to the Nucleus
Signaling by NOTCH2
NOTCH2 Activation and Transmission of Signal to the Nucleus
Signaling by NOTCH3
NOTCH3 Activation and Transmission of Signal to the Nucleus
NOTCH3 Intracellular Domain Regulates Transcription
Signaling by NOTCH4
Negative regulation of NOTCH4 signaling
Signaling by Non−Receptor Tyrosine Kinases
Signaling by PTK6
PTK6 Regulates RHO GTPases, RAS GTPase and MAP kinases
Signaling by Receptor Tyrosine Kinases
Signaling by ERBB2
Downregulation of ERBB2 signaling
Signaling by SCF−KIT
Regulation of KIT signaling
Signaling by EGFR
EGFR downregulation
Signaling by MET
Negative regulation of MET activity
Signaling by Rho GTPases, Miro GTPases and RHOBTB3
Signaling by Rho GTPases
Signaling by WNT
Degradation of beta−catenin by the destruction complex
TCF dependent signaling in response to WNT
Formation of the beta−catenin:TCF transactivating complex
Degradation of AXIN
Degradation of DVL
Beta−catenin independent WNT signaling
Ca2+ pathway
PCP/CE pathway
ABC−family proteins mediated transport
Iron uptake and transport
Plasma lipoprotein assembly, remodeling, and clearance
Plasma lipoprotein clearance
VLDLR internalisation and degradation
SLC−mediated transmembrane transport
Transport of bile salts and organic acids, metal ions and amine compounds
Membrane Trafficking
Gap junction trafficking and regulation
Gap junction trafficking
ER to Golgi Anterograde Transport
trans−Golgi Network Vesicle Budding
Lysosome Vesicle Biogenesis
Golgi−Associated Vesicle Biogenesis
Intra−Golgi and retrograde Golgi−to−ER traffic
Golgi−to−ER retrograde transport
Clathrin−mediated endocytosis
Cargo recognition for clathrin−mediated endocytosis
Rab regulation of trafficking
Endosomal Sorting Complex Required For Transport (ESCRT)
CD4 Naive
CD4 TCM
CD4 EM
CD4 Treg
CD8 Naive
CD8 TCM
CD8 EM
CD8 Memory