



## 159 Canonical pathways present in MUSE cells, BM MSC and A MSC

fMLP Signaling in Neutrophils  
 Neuroprotective Role of THOP1 in Alzheimer's Disease  
 Cardiac Hypertrophy Signaling  
 Sphingosine-1-phosphate Signaling  
 Signaling by Rho Family GTPases  
 Hepatic Fibrosis / Hepatic Stellate Cell Activation  
 Role of Tissue Factor in Cancer  
 Role of NFAT in Cardiac Hypertrophy  
 Ephrin Receptor Signaling  
 Wnt/Ca<sup>+</sup> pathway  
 Aspartate Degradation II  
 Pyruvate Fermentation to Lactate  
 Unfolded protein response  
 Mechanisms of Viral Exit from Host Cells  
 Leukocyte Extravasation Signaling  
 IL-6 Signaling  
 Regulation of IL-2 Expression in Activated and Anergic T Lymphocytes  
 Activation of IRF by Cytosolic Pattern Recognition Receptors  
 Caveolar-mediated Endocytosis Signaling  
 Remodeling of Epithelial Adherens Junctions  
 Telomerase Signaling  
 Neuregulin Signaling  
 Ephrin B Signaling  
 Pentose Phosphate Pathway (Oxidative Branch)  
 Sucrose Degradation V (Mammalian)  
 Guanosine Nucleotides Degradation III  
 Hypoxia Signaling in the Cardiovascular System  
 Dermatan Sulfate Degradation (Metazoa)  
 HIF1 $\alpha$  Signaling  
 Docosahexaenoic Acid (DHA) Signaling  
 Rapoport-Luebering Glycolytic Shunt  
 Ephrin A Signaling

Prostate Cancer Signaling  
 NAD Salvage Pathway II  
 Role of Pattern Recognition Receptors in Recognition of Bacteria and Viruses  
 Death Receptor Signaling  
 Granulocyte Adhesion and Diapedesis  
 RhoGDI Signaling  
 PAK Signaling  
 PCP pathway  
 Adenosine Nucleotides Degradation II  
 Phospholipases  
 CCR5 Signaling in Macrophages  
 Tight Junction Signaling  
 Huntington's Disease Signaling  
 Colanic Acid Building Blocks Biosynthesis  
 CCR3 Signaling in Eosinophils  
 eNOS Signaling  
 PPAR $\alpha$ /RXR $\alpha$  Activation  
 Agrin Interactions at Neuromuscular Junction  
 Bladder Cancer Signaling  
 Tec Kinase Signaling  
 VEGF Signaling  
 Cellular Effects of Sildenafil (Viagra)  
 Virus Entry via Endocytic Pathways  
 Urate Biosynthesis/Inosine 5'-phosphate Degradation  
 p70S6K Signaling  
 Regulation of Actin-based Motility by Rho  
 ERK/MAPK Signaling  
 Mitochondrial Dysfunction  
 Nitric Oxide Signaling in the Cardiovascular System  
 Oncostatin M Signaling  
 Aryl Hydrocarbon Receptor Signaling  
 Aldosterone Signaling in Epithelial Cells  
 Maturity Onset Diabetes of Young (MODY) Signaling  
 phagosome maturation  
 Protein Ubiquitination Pathway  
 p53 Signaling  
 Macropinocytosis Signaling  
 Complement System  
 Agranulocyte Adhesion and Diapedesis  
 Thrombin Signaling  
 phagosome formation  
 Integrin Signaling  
 PI3K/AKT Signaling  
 TR/RXR Activation  
 Glioma Invasiveness Signaling  
 Inhibition of Matrix Metalloproteases  
 Lipid Antigen Presentation by CD1  
 IL-17 Signaling  
 Purine Nucleotides Degradation II (Aerobic)  
 Axonal Guidance Signaling  
 PPAR Signaling  
 TGF- $\beta$  Signaling  
 Semaphorin Signaling in Neurons  
 Epithelial Adherens Junction Signaling  
 Cdc42 Signaling  
 Synaptic Long Term Depression  
 ERK5 Signaling  
 Gap Junction Signaling  
 Crosstalk between Dendritic Cells and Natural Killer Cells  
 Dendritic Cell Maturation

RhoA Signaling  
 IL-8 Signaling  
 Production of Nitric Oxide and Reactive Oxygen Species in Macrophages  
 VDR/RXR Activation  
 Leptin Signaling in Obesity  
 ILK Signaling  
 Paxillin Signaling  
 Inhibition of Angiogenesis by TSP1  
 Gluconeogenesis I  
 PEDF Signaling  
 Melatonin Signaling  
 PI3K Signaling in B Lymphocytes  
 Glutathione Redox Reactions II  
 NADH Repair  
 TCA Cycle II (Eukaryotic)  
 Clathrin-mediated Endocytosis Signaling  
 GABA-glutamyl Cycle  
 Coagulation System  
 UDP-N-acetyl-D-galactosamine Biosynthesis II  
 Pentose Phosphate Pathway (Non-oxidative Branch)  
 Chemokine Signaling  
 GPCR-Mediated Integration of Enteroendocrine Signaling Exemplified by an L Cell  
 Cell Cycle: G2/M DNA Damage Checkpoint Regulation  
 LXR/RXR Activation  
 Endoplasmic Reticulum Stress Pathway  
 EIF2 Signaling  
 Role of Macrophages, Fibroblasts and Endothelial Cells in Rheumatoid Arthritis  
 Airway Pathology in Chronic Obstructive Pulmonary Disease  
 CDK5 Signaling  
 14-3-3-mediated Signaling  
 Glycolysis I  
 Sertoli Cell-Sertoli Cell Junction Signaling  
 Corticotropin Releasing Hormone Signaling  
 Intrinsic Prothrombin Activation Pathway  
 MSP-RON Signaling Pathway  
 GPCR-Mediated Nutrient Sensing in Enteroendocrine Cells  
 Extrinsic Prothrombin Activation Pathway  
 Regulation of Cellular Mechanics by Calpain Protease  
 Germ Cell-Sertoli Cell Junction Signaling  
 Pentose Phosphate Pathway  
 P2Y Purigenic Receptor Signaling Pathway  
 Protein Kinase A Signaling  
 IL-12 Signaling and Production in Macrophages  
 FXR/RXR Activation  
 RAR Activation  
 Breast Cancer Regulation by Stathmin1  
 Rac Signaling  
 Apoptosis Signaling  
 Myc Mediated Apoptosis Signaling  
 Actin Cytoskeleton Signaling  
 HIPPO signaling  
 Chondroitin Sulfate Degradation (Metazoa)  
 Superoxide Radicals Degradation  
 Acute Phase Response Signaling  
 Calcium Transport I  
 Dopamine-DARPP32 Feedback in cAMP Signaling  
 Growth Hormone Signaling  
 FAK Signaling

Androgen Signaling  
 FcγR Receptor-mediated Phagocytosis in Macrophages and Monocytes  
 HER-2 Signaling in Breast Cancer  
 Antigen Presentation Pathway  
 IGF-1 Signaling  
 Mitotic Roles of Polo-Like Kinase  
 Glucocorticoid Receptor Signaling  
 NRF2-mediated Oxidative Stress Response  
 Atherosclerosis Signaling

## **49 Canonical pathways present in BM MSC and A MSCs**

Nicotine Degradation III  
 Reelin Signaling in Neurons  
 IL-17A Signaling in Fibroblasts  
 Cyclins and Cell Cycle Regulation  
 Acetyl-CoA Biosynthesis III (from Citrate)  
 DNA Double-Strand Break Repair by Non-Homologous End Joining  
 Melatonin Degradation I  
 Diphthamide Biosynthesis  
 Uracil Degradation II (Reductive)  
 BMP signaling pathway  
 Glucose and Glucose-1-phosphate Degradation  
 mTOR Signaling  
 Factors Promoting Cardiogenesis in Vertebrates  
 RAN Signaling  
 Heparan Sulfate Biosynthesis  
 Basal Cell Carcinoma Signaling  
 Trehalose Degradation II (Trehalase)  
 CD28 Signaling in T Helper Cells  
 Glutathione-mediated Detoxification  
 Role of Cytokines in Mediating Communication between Immune Cells  
 Thymine Degradation  
 tRNA Charging  
 UDP-D-xylose and UDP-D-glucuronate Biosynthesis  
 Xenobiotic Metabolism Signaling  
 Thyroid Hormone Metabolism II (via Conjugation and/or Degradation)  
 VEGF Family Ligand-Receptor Interactions  
 Antiproliferative Role of TOB in T Cell Signaling  
 Cell Cycle: G1/S Checkpoint Regulation  
 Colorectal Cancer Metastasis Signaling  
 GDP-glucose Biosynthesis  
 Renal Cell Carcinoma Signaling  
 Nicotine Degradation II  
 Regulation of the Epithelial-Mesenchymal Transition Pathway  
 Serotonin Degradation  
 Role of PI3K/AKT Signaling in the Pathogenesis of Influenza  
 Role of p14/p19ARF in Tumor Suppression  
 Actin Nucleation by ARP-WASP Complex  
 HMGB1 Signaling  
 Heparan Sulfate Biosynthesis (Late Stages)  
 Amyloid Processing  
 Superpathway of Melatonin Degradation  
 CXCR4 Signaling  
 T Helper Cell Differentiation  
 Human Embryonic Stem Cell Pluripotency  
 p38 MAPK Signaling  
 Role of IL-17A in Arthritis

Role of Osteoblasts, Osteoclasts and Chondrocytes in Rheumatoid Arthritis  
Regulation of eIF4 and p70S6K Signaling  
Telomere Extension by Telomerase

## **88 Canonical pathways present in MUSE cells**

Dopamine Receptor Signaling  
Granzyme B Signaling  
UVA-Induced MAPK Signaling  
Role of NFAT in Regulation of the Immune Response  
BER pathway  
TWEAK Signaling  
Melanocyte Development and Pigmentation Signaling  
Serine Biosynthesis  
Arginine Degradation VI (Arginase 2 Pathway)  
Neuropathic Pain Signaling In Dorsal Horn Neurons  
CD27 Signaling in Lymphocytes  
Hematopoiesis from Pluripotent Stem Cells  
CTLA4 Signaling in Cytotoxic T Lymphocytes  
Ethanol Degradation IV  
Role of PKR in Interferon Induction and Antiviral Response  
Synaptic Long Term Potentiation  
Acute Myeloid Leukemia Signaling  
Vitamin-C Transport  
Parkinson's Signaling  
G Protein Signaling Mediated by Tubby  
nNOS Signaling in Neurons  
Salvage Pathways of Pyrimidine Ribonucleotides  
Urea Cycle  
Pyrimidine Ribonucleotides Interconversion  
Sperm Motility  
Glutamate Degradation II  
Ceramide Signaling  
Thyroid Hormone Biosynthesis  
Thioredoxin Pathway  
TNFR1 Signaling  
Nur77 Signaling in T Lymphocytes  
Guanine and Guanosine Salvage I  
GABA Receptor Signaling  
Allograft Rejection Signaling  
Phenylalanine Degradation IV (Mammalian, via Side Chain)  
Retinoic acid Mediated Apoptosis Signaling  
Adenine and Adenosine Salvage III  
Superpathway of Methionine Degradation  
Purine Ribonucleosides Degradation to Ribose-1-phosphate  
Glutathione Biosynthesis  
GDP-mannose Biosynthesis  
Gustation Pathway  
Primary Immunodeficiency Signaling  
Calcium-induced T Lymphocyte Apoptosis  
Citrulline Biosynthesis  
Adenine and Adenosine Salvage I  
G Beta Gamma Signaling  
Autoimmune Thyroid Disease Signaling  
Superpathway of Serine and Glycine Biosynthesis I  
G $\alpha$ q Signaling  
Communication between Innate and Adaptive Immune Cells  
Glioma Signaling  
Granzyme A Signaling

$\alpha$ -Adrenergic Signaling  
 Tumoricidal Function of Hepatic Natural Killer Cells  
 Superpathway of Citrulline Metabolism  
 Role of IL-17A in Psoriasis  
 Phospholipase C Signaling  
 L-cysteine Degradation I  
 Cardiac  $\alpha$ -adrenergic Signaling  
 Calcium Signaling  
 UVB-Induced MAPK Signaling  
 IL-1 Signaling  
 Serotonin Receptor Signaling  
 cAMP-mediated signaling  
 RANK Signaling in Osteoclasts  
 Relaxin Signaling  
 Arginine Degradation I (Arginase Pathway)  
 Amyotrophic Lateral Sclerosis Signaling  
 Glutamate Receptor Signaling  
 Aspartate Biosynthesis  
 B Cell Receptor Signaling  
 Lymphotoxin  $\alpha$  Receptor Signaling  
 Induction of Apoptosis by HIV1  
 Small Cell Lung Cancer Signaling  
 Pyrimidine Deoxyribonucleotides De Novo Biosynthesis I  
 Cytotoxic T Lymphocyte-mediated Apoptosis of Target Cells  
 tRNA Splicing  
 OX40 Signaling Pathway  
 CREB Signaling in Neurons  
 Pyrimidine Ribonucleotides De Novo Biosynthesis  
 iNOS Signaling  
 Arsenate Detoxification I (Glutaredoxin)  
 nNOS Signaling in Skeletal Muscle Cells  
 Endothelin-1 Signaling  
 Xanthine and Xanthosine Salvage  
 T Cell Receptor Signaling  
 Antioxidant Action of Vitamin C