

Article Title: Comparative Transcriptomic Analyses to Scrutinise the Assumption That Genotoxic Priority PAHs Exert Effects via a Common Mode of Action

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Supplementary File 2 - Collapsed functional groupings for each pathway and process

	Gene Ontologies	KEGG pathways	IPA Canonical Pathways	MetaCore: Process Networks
DNA damage response				
Apoptosis	GO:0006915 apoptosis		Apoptosis Signaling	Apoptosis: Apoptotic nucleus
	GO:0006917 induction of apoptosis			Apoptosis: Anti-Apoptosis mediated by external signals via PI3K/AKT
	GO:0043065 positive regulation of apoptosis			Apoptosis: Apoptotic mitochondria
	GO:0008629 induction of apoptosis by intracellular signals			Apoptosis: Endoplasmic reticulum stress pathway
	GO:0001844 protein insertion into mitochondrial membrane during induction of apoptosis			
	GO:0042981 regulation of apoptosis			
	GO:0043066 negative regulation of apoptosis			
	GO:0006916 anti-apoptosis			
ATM signaling			ATM signaling	
Cell cycle	GO:0007049 cell cycle	mmu04110:Cell cycle	Cell Cycle: G1/S Checkpoint Regulation	Cell cycle: Core
	GO:0007050 cell cycle arrest		Cell Cycle: G2/M DNA Damage Checkpoint Regulation	Cell cycle: G1-S
	GO:0000087 M phase of mitotic cell cycle		Cyclins and Cell Cycle Regulation	Cell cycle: G2-M
	GO:0007067 mitosis		Cell Cycle Control of Chromosomal Replication	

GO:0022402 cell cycle process

Role of CHK Proteins in Cell Cycle Checkpoint Control Cell cycle: Mitosis

GO:0051329 interphase of mitotic cell cycle

Role of BRCA1 in DNA Damage Response Cell cycle: S phase

GO:0000278 mitotic cell cycle

Mitotic Roles of Polo-Like Kinase Cell cycle: G0-G1

GO:0000075 cell cycle checkpoint

Estrogen-mediated S-phase entry Cell cycle: G1-S Growth factor regulation

GO:0000082 G1/S transition of mitotic cell cycle

Cell cycle: G1-S Interleukin regulation

GO:0000910 cytokinesis

DNA damage: Checkpoint

GO:0007093 mitotic cell cycle checkpoint

GO:0007346 regulation of mitotic cell cycle

GO:0051325 interphase

GO:0051726 regulation of cell cycle

GADD45 signaling

GADD45 signaling

p53 signaling pathway

mmu04115:p53 signaling pathway

p53 Signaling

Altered cell signaling

14-3-3 signaling

14-3-3-mediated Signaling

ABC transporter signaling

mmu02010:ABC transporters

AhR signaling

Aryl Hydrocarbon Receptor Signaling

Aldosterone signaling

Aldosterone Signaling in Epithelial Cells

AMPK signaling

AMPK Signaling

Angiogenesis

GO:0001525 angiogenesis

Development: Regulation of angiogenesis

GO:0045765 regulation of angiogenesis

Cardiac development: Wnt_beta-catenin, Notch, VEGF, IP3 and integrin signaling

GO:0045766 positive regulation of angiogenesis

GO:0016525 negative
regulation of angiogenesis

Cell-cell signaling		Epithelial Adherens Junction Signaling Gap Junction Signaling Tight Junction Signaling
Endocytosis	GO:0006897~endocytosis	Virus Entry via Endocytic Pathways Caveolar-mediated Endocytosis Signaling Fcγ Receptor-mediated Phagocytosis in Macrophages and Monocytes Macropinocytosis Signaling
Endothelin signaling		Endothelin-1 Signaling
Ephrin receptor signaling	GO:0048013~ephrin receptor signaling pathway	
Estrogen receptor signaling		Estrogen receptor signaling
Exocytosis	GO:0006887~exocytosis	
FGF signaling		FGF Signaling
G protein signaling		G-Protein Coupled Receptor Signaling cAMP-mediated signaling Dopamine-DARPP32 Feedback in cAMP Signaling Gαi Signaling Gαq Signaling Cholecystokinin/Gastrin- mediated Signaling
Glucocorticoid receptor signaling		Glucocorticoid Receptor Signaling
GNRH signaling		GNRH Signaling
Hypoxia signaling		HIF1α Signaling
IGF-1 signaling		IGF-1 Signaling

Lipid signaling		Sphingosine-1-phosphate signaling Cholecystokinin/Gastrin-mediated signaling Docosahexaenoic Acid (DHA) Signaling Eicosanoid Signaling
NF-κB Signaling		NF-κB Signaling
Nitric oxide signaling		nNOS Signaling in Skeletal Muscle Cells Nitric Oxide Signaling in the Cardiovascular System
MTOR signaling		mTOR Signaling
Neuronal signaling	mmu04360:Axon guidance	Axonal Guidance Signaling
	mmu04080:Neuroactive ligand-receptor interaction	Neuropathic Pain Signaling In Dorsal Horn Neurons
		Synaptic Long Term Potentiation CDK5 Signaling Netrin Signaling GABA Receptor Signaling
NRF2 signaling		NRF2-mediated Oxidative Stress Response
p70S6K Signaling		p70S6K Signaling
PDGF signaling		PDGF Signaling
PI3K/Akt signaling		PI3K/AKT Signaling
PPAR signaling	mmu03320:PPAR signaling pathway	PPAR Signaling
PKA signaling		Protein Kinase A Signaling
PTEN Signaling		PTEN Signaling
RAR signaling		RAR Activation
STAT3 signaling		STAT3 Pathway
Stem cell pluripotency		Human Embryonic Stem Cell Pluripotency
RXR signaling		LXR/RXR Activation VDR/RXR Activation PPARα/RXRα Activation

			PXR/RXR Activation	
			FXR/RXR Activation	
TGF- β Signaling			TGF- β Signaling	
TREM1 signaling			TREM1 Signaling	
Ubiquitination			Protein Ubiquitination Pathway	
Wnt signaling	GO:0016055 Wnt receptor signaling pathway	mmu04340:Hedgehog signaling pathway	Wnt/ β -catenin Signaling	
	GO:0030111 regulation of Wnt receptor signaling pathway		Sonic Hedgehog Signaling	
	GO:0030178~negative regulation of Wnt receptor signaling pathway			
Immune/inflammatory response				
Antibody production		mmu04672:Intestinal immune network for IgA production		
Antigen processing and presentation	GO:0002474 antigen processing and presentation of peptide antigen via MHC class I	mmu04612:Antigen processing and presentation	Antigen Presentation Pathway	Immune response: Phagosome in antigen presentation
	GO:0002475 antigen processing and presentation via MHC class Ib			Immune response: Antigen presentation
	GO:0002478 antigen processing and presentation of exogenous peptide antigen			
	GO:0002495 antigen processing and presentation of peptide antigen via MHC class II			
	GO:0002504 antigen processing and presentation of peptide or polysaccharide antigen via MHC class II			

GO:0019882 antigen
processing and presentation

GO:0019884 antigen
processing and presentation
of exogenous antigen

GO:0019886 antigen
processing and presentation
of exogenous peptide
antigen via MHC class II

GO:0048002 antigen
processing and presentation
of peptide antigen

B cell receptor signaling	GO:0019724 B cell mediated immunity	mmu04662:B cell receptor signaling pathway	B Cell Development	Immune response: BCR pathway
	GO:0030183 B cell differentiation		B Cell Activating Factor Signaling	
	GO:0030888 regulation of B cell proliferation		B cell receptor signaling	
	GO:0030890 positive regulation of B cell proliferation			
	GO:0042113 B cell activation			
	GO:0050853 B cell receptor signaling pathway			
	GO:0050864 regulation of B cell activation			
	GO:0050871 positive regulation of B cell activation			
Chemokine signaling	GO:0006935 chemotaxis	mmu04062:Chemokine signaling pathway	Chemokine Signaling	Chemotaxis
				Cell adhesion: Leucocyte chemotaxis

Complement system signaling	GO:0006956 complement activation GO:0006958 complement activation, classical pathway	mmu04610:Complement and coagulation cascades	Complement System	Inflammation: Complement system
Cytokine-cytokine receptor signaling	GO:0006954 inflammatory response GO:0034097 response to cytokine stimulus GO:0019221 cytokine-mediated signaling pathway	mmu04060:Cytokine-cytokine receptor interaction		
Cytotoxic T cell signaling			CTLA4 Signaling in Cytotoxic T Lymphocytes Cytotoxic T Lymphocyte-mediated Apoptosis of Target Cells	
Hematopoiesis		mmu04640:Hematopoietic cell lineage		
Immune cell communication			Communication between innate and adaptive immune cells Crosstalk between Dendritic Cells and Natural Killer Cells Dendritic Cell Maturation	
Immune-mediated apoptosis		mmu04650:Natural killer cell mediated cytotoxicity	Granzyme A Signaling Calcium-induced T Lymphocyte Apoptosis Nur77 Signaling in T Lymphocytes	
Interferon signaling			Interferon Signaling	Inflammation: Interferon signaling Inflammation: IFN-gamma signaling
Interleukin signaling			IL-4 Signaling	Inflammation: IL-10 anti-inflammatory response

		Role of IL-17A in Arthritis	Inflammation: IL-6 signaling
		IL-8 Signaling	Inflammation: IL-4 signaling
		IL-17A Signaling in Gastric Cells	Inflammation: IL-13 signaling pathway
		IL-6 Signaling	
MSP-RON signaling		MSP-RON Signaling Pathway	
Natural killer T cell signaling		Natural Killer Cell Signaling	Inflammation: NK cell cytotoxicity
		Tumoricidal Function of Hepatic Natural Killer Cells	
		Crosstalk between Dendritic Cells and Natural Killer Cells	
Nod-like receptor signaling	mmu04621:NOD-like receptor signaling pathway		
OX40 signaling		OX40 Signaling Pathway	
Pattern recognition receptors		Role of Pattern Recognition Receptors in Recognition of Bacteria and Viruses	
		Activation of IRF by Cytosolic Pattern Recognition Receptors	
T helper cell signaling		T Helper Cell Differentiation	
		CD28 Signaling in T Helper Cells	
		iCOS-iCOSL Signaling in T Helper Cells	
Cytoskeletal organization			
Actin signaling		Actin Cytoskeleton Signaling	
CDC42 signaling		Cdc42 Signaling	
Extracellular membrane interactions	mmu04510:Focal adhesion		

mmu04512:ECM-receptor
interaction

FAK signaling	FAK Signaling	
Integrin signaling	Integrin Signaling	Cell adhesion: Integrin-mediated cell-matrix adhesion
Paxillin signaling	Paxillin Signaling	
RHO signaling	RhoA Signaling Signaling by Rho Family GTPases Regulation of Actin-based Motility by Rho RhoGDI Signaling	
Thrombin signaling	Extrinsinc pro-thrombin activation pathway Thrombin signaling	

Altered metabolism

Amino acid metabolism	GO:0009063~cellular amino acid catabolic process	mmu00270:Cysteine and methionine metabolism	
	GO:0009066~aspartate family amino acid metabolic process	mmu00260:Glycine, serine and threonine metabolism	
		mmu00280:Valine, leucine and isoleucine degradation	
Estrogen biosynthesis		Estrogen biosynthesis	
Glutathione metabolism		mmu00480:Glutathione metabolism	Glutathione-mediated Detoxification
Intracellular transport	GO:0046907 intracellular transport GO:0006890 retrograde vesicle-mediated transport, Golgi to ER GO:0090004 positive regulation of establishment of protein localization to plasma membrane		

	GO:0090003 regulation of establishment of protein localization to plasma membrane		
	GO:0016192~vesicle-mediated transport		
Lipid metabolism	GO:0006633 fatty acid biosynthetic process	mmu00600:Sphingolipid metabolism	Lipid Metabolism
	GO:0006631~fatty acid metabolic process	mmu00561:Glycerolipid metabolism	
	GO:0006643 membrane lipid metabolic process	mmu00590:Arachidonic acid metabolism	
	GO:0006644 phospholipid metabolic process	mmu00591:Linoleic acid metabolism	
	GO:0006665 sphingolipid metabolic process		
	GO:0006695~cholesterol biosynthetic process		
	GO:0006869 lipid transport		
	GO:0008610 lipid biosynthetic process		
	GO:0010876 lipid localization		
	GO:0016042 lipid catabolic process		
	GO:0030149 sphingolipid catabolic process		
	GO:0044242 cellular lipid catabolic process		
	GO:0046466 membrane lipid catabolic process		
	GO:0046486 glycerolipid metabolic process		
Melatonin degradation			Melatonin Degradation I Superpathway of Melatonin Degradation
Oxidative Phosphorylation		mmu00190:Oxidative phosphorylation	

Protein folding	GO:0051085 chaperone mediated protein folding requiring cofactor GO:0006458 'de novo' protein folding GO:0051084 'de novo' posttranslational protein folding GO:0006457 protein folding		Protein folding: Response to unfolded proteins Protein folding: Folding in normal condition Protein folding: Protein folding nucleus Protein folding: ER and cytoplasm
Proteolysis	GO:0006508 proteolysis		Proteolysis: ECM remodeling Proteolysis: Proteolysis in cell cycle and apoptosis Proteolysis: Connective tissue degradation
Retinol metabolism		mmu00830:Retinol metabolism	Retinol Biosynthesis Retinoate Biosynthesis I
RNA processing	GO:0008380~RNA splicing GO:0016071 mRNA metabolic process GO:0006397 mRNA processing GO:0006396 RNA processing	mmu03040:Spliceosome	
Steroid biosynthesis	GO:0006694~steroid biosynthetic process GO:0008202~steroid metabolic process GO:0016125~sterol metabolic process GO:0016126~sterol biosynthetic process GO:0008203~cholesterol metabolic process	mmu00140:Steroid hormone biosynthesis	
Transcription	GO:0006350 transcription		Transcription: mRNA processing

GO:0006355 regulation of transcription, DNA-dependent
 GO:0006357 regulation of transcription from RNA polymerase II promoter
 GO:0010553 negative regulation of specific transcription from RNA polymerase II promoter
 GO:0016481 negative regulation of transcription
 GO:0045892 negative regulation of transcription, DNA-dependent

Transcription: Transcription by RNA polymerase II

Xenobiotic metabolism	GO:0006805 xenobiotic metabolic process	mmu00980:Metabolism of xenobiotics by cytochrome P450	Xenobiotic Metabolism Signaling
	GO:0009410 response to xenobiotic stimulus	mmu00982:Drug metabolism	Nicotine Degradation II
	GO:0009404~toxin metabolic process	mmu00983:Drug metabolism	Nicotine Degradation III
	GO:0018894~dibenzo-p-dioxin metabolic process		Bupropion Degradation
	GO:0042537~benzene and derivative metabolic process		Acetone Degradation I (to Methylglyoxal)

Homeostasis

Calcium signaling	GO:0006874 cellular calcium ion homeostasis	mmu04020:Calcium signaling pathway	Calcium Signaling
	GO:0055074 calcium ion homeostasis		D-myo-inositol (1,4,5)-Trisphosphate Biosynthesis
	GO:0051480~cytosolic calcium ion homeostasis		Regulation of Cellular Mechanics by Calpain Protease
Circadian rhythm	GO:0007623 circadian rhythm	mmu04710:Circadian rhythm	Circadian Rhythm Signaling

