4- upregulated by ABA only. minor AFP2 effects

maintaining storage of lipids and sugars, response to water/cold, cell homeostasis,

seed oilbody biogenesis,

lipid storage,

maintenance of location (inhibits mobilization/breakdown of lipids),

starch and sucrose metabolism

glycogen metabolic process

amyloplast

response to water/deprivation,

- this is more specific to ABA (4) than TSA (9)

response to cold (also by 8 and 7

- more so by AFP2 on ABA, and more so by AFP2 on TSA)

cell homeostasis,

response to ABA,

acid chemical - this is a more aba specific response

9- upregulated by ABA and TSA. downregulated by AFP2 slightly

seed germination / development

show cytoscape.

regulation of seed germination - not specific to ABA. by TSA and ABA.

regulation of seedling development

seed maturation

multicellular organismal reproductive process - describes seed set

protein serine/threonine

release of seed from dormancy.

1b - most upregulated by TSA,

and also downregulated by AFP2 (mostly on TSA)

ribosome biogenesis (show KEGGs) what other effects does this have?,

RNA helicase/polymerase activity (show KEGG)

regulation of chromatin organization,

chromatin organization involved in negative regulation of transcription,

negative regulation of gene expression,

regulation of gene silencing, (gene silencing by RNA)

chromatin silencing,

histone modification,

covalent chromatin modification,

nulceosome binding,

regeneration,

somatic embryogenesis

embryo development ending in seed dormancy,

cotyledon development,

Zeatin biosynthesis

-cytokinin involved in cell division

aba biosynthetic process,

cell response to DNA damage stimulus,

DNA repair,

ethylene-activated signaling pathway,

leaf development,

mRNA processing,

lots of large terms specific to this cluster

1- specifically upregulated by TSA. AFP2 no effect

positive regulation of protein catabolic process,

1-phosphatidylinositol-3-phosphate 5-kinase activity

- regulates actin cytosksleton and phosphatidylinositol signaling

neddylation,

integral component of mitochondrial membrane

organelle localization,

transport,

a bunch of binding stuff

6 - upregulated by AFP2 overexpression, especially in GM

photosystem 1, light harvesting

thykaloids,

ps 2 light harvesting,

vacuolar lumen

hydrogen peroxide catabolism/transport

-maybe in redox

positive regulation of developmental growth

cell growth

cell development

protein domain specific binding,

water transport (and by AFP2 in ABA - 8)

pectinesterase inhibitor activity,

pectin metabolic process

cell wall organization

lipid catabolic process

hydrogen peroxide metabolic process

tetrapyrrole binding

heme binding

iron ion bonding

response to auxin

8- upregulated by AFP2 overepxression especially in ABA, not in TSA

modified amino acid binding

glutathione binding - protects proteins from denaturation under stress

also transmits signals for maintaining cellular homeostasis in

-this stress response amplified by afp2 on aba

glutathione tranferase

more binding - chitin, flavonoid, quercitrin, camalexin, cobalt ion

glutathione metabolism

nutrient reservoir activity

storage vacuole

glycoxylate metabolism

carbohydrate derivative catabolic process

proton-transporting ATP synthase complex

ATP synthesis coupled protein transport

ATP biosynthesis process

water transport,

water channel activity,

passive transmembrane transporter activity

extracellular matrix

toxin catabolic process- less in GM

response to toxic substance

passive transmembrane transporter activity

response to toxic substance

antioxidant activity

reponse to stress HIGHEST

7 - upregulated by AFP2 overexpression except in ABA

a lot of long chain fatty acids synthesis,

cellular lipid metabolic process

ion transport,

wax biosynthesis,

lignin biosynthetic process,

glycolysis

sucrose metabolism

phenylpropanoid biosynthesis

mono-carboxylic acid biosynthetic process

organic acid transport

response to wounding

plant-pathogen interaction

response to karrikin

5- upregulated by AFP2 overexpression, especially in TSA

cellular response to heat,

ABC-type xenobiotic transporter activity,

glutathione metabolism/transferase,

reponse to nitrogen compound,

response to salt stress,

resposne to chitin, response to karrikin,

reponse to hypoxia,

response to osmotic stress

MAPK signaling pathway

DNA binding stuff (transcription factor activity)

STRONGEST reponse to stress, stimulus, chemical

2- downregulated by both ABA and TSA,

cellulose synthase,

cell wall biogenesis,

cell wall organization,

transport of virus,

flavonoid biosynthesis,

sucrose metabolism

cellular polysaccharide metabolic process

response to chitin, response to hypoxia, (less than others)

3- downregulated by TSA, upregulated by AFP2 mostly on ABA

nucleoid,

ER body,

plastid ribosome,

rRNA binding,

RNA stabilization

chloroplast rRNA processing,

aldehyde metabolic process,

pyruvate metabolism,

NAD(P)H dehydrogenase complex assembly

intramolecular oxidoreductase activity

protein peptidyl-prolyl isomerization

isomerase activity

photosynthesis, dark reaction

thykaloid membrane

poryphyrin and clorophyll,

STRONGEST cellular reponse to toxic ,

3c- downregulated by TSA, \*Y<Col on GM/ABA\* Y>Col on TSA\*

ATP-dependent microtubule motor activity

G2/M transition of mitotic cell cycle

diphosphomevalonate decarboxylase - sterols and terpenoids

glucosinolate biosynthesis

cyclin-dependent protein kinase holoenzyme complex

very specific oxidoreductase term

tubulin binding,

microtubule binding,

cytoskeleton,cell cycle

regulation of cell cycle process

reponse to hypoxia,

cell cycle

3.b downregulated by TSA, \*Y>Col on all media\*

DNA replication

DNA replication origin binding

DNA packaging complex

DNA replication initiation

chromocenter

nucleosome

MCM complex - required for initiation of DNA replication

amino sugar and nucletoide sugar metabolism

nucleotide-sugar metabolic process

dTDP-glucose 4,6-dehydratase activity

fatty acid biosynthesis

cyclin-dependent protein kinase holoenzyme complex

cyclin-dependent protein serine/threonine kinase regulator activity

protein kinase complex

double strand break repair

recombinational repair

spindle microtubule

microtubule

intramolecular transferase activity

DNA replication checkpoint signalling

DNA replication checkpoint signaling

cell cycle checkpoint signaling

mitotic cell cycle phase transition

cell division

mitotic cell cycle

photosynthesis dark

DNA replication

protein-DNA complex

DNA-dependent DNA replication

Golgi stack

Golgi cisterna

trans-Golgi network

microtubule cytoskeleton organization

microtubule cytoskeleton

STRONGEST isomerase activity,