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Monday, July 21 2025

Significant Genes and Their Functions (Using NCBI Database)

XIST (X-inactive specific transcript)

Function of this gene:

- Produces a long non-coding RNA that does not make a protein but instead acts directly as RNA.

How this gene is relevant in our data:

- Only up regulated gene in males when using a log2 fold change greater than 1 and 0.5.
- Not present as a top significant gene in males when using a log2 fold change greater than 0.2.
- Tied for the top upregulated significant gene with ZFX when using a log2 fold change greater than 0.1 and is also the third and fifth topmost significant upregulated gene in males with the same log2 fold change cutoff.

Other diseases this gene might be linked to:

- Alzheimer's disease
- Non-small cell lung carcinoma

TXLNGY (Taxilin Gamma Y-Linked)

Function of this gene:

- Predicted to enable syntaxin binding.

How this gene is relevant in our data:

- Is the topmost significant downregulated gene in males when using a log2 fold change cutoff of greater than 0.5.

-Tied as the topmost significant downregulated gene in males with UTY using a log2 fold change cutoff of greater than 0.1 and is also the fifth most significant downregulated when using this same log2 fold change cutoff.

Other diseases this gene might be linked to:

- Allergic rhinitis
- Sepsis
- Hepatocellular Carcinoma
- Coronary Artery Disease

RPS4Y1 (Ribosomal Protein S4 Y-Linked 1)

Function of this Gene:

-Protein coding gene located on the Y chromosome. Contributes to assembly and stability of the ribosome.

How this gene is relevant in our data:

-Is the second most significant downregulated gene in males when using a log2 fold change cutoff of greater than 0.5 and 0.1.

Other diseases this gene might be linked to:

- Ulcerative colitis
- Lung adenocarcinoma
- Gastric cancer
- Papillary Thyroid Carcinoma
- Glioblastoma
- Pancreatic cancer
- Parkinson's disease

KDM5D (Lysine Demethylase 5D)

Function of this Gene:

-Plays a key role in epigenetic regulation by modifying histones (proteins that help package DNA).

How this gene is relevant in our data:

-Is the third most significant downregulated gene in males when using a log2fold change cutoff of greater than 0.5 and 0.1.

Other diseases this gene might be linked to:

- Prostate cancer
- Retinal neovascularization
- Head and Neck Squamous Cell Carcinoma
- Small Cell Lung Cancer

DDX3Y (DEAD-Box Helicase 3 Y-Linked)

Function of this Gene:

-Protein coding gene on the Y chromosome that encodes an ATP-dependent RNA helicase.

How this gene is relevant in our data:

-Is the fourth most significant downregulated gene in males with a log2 fold change cutoff of greater than 0.5 and 0.1.\

Other diseases this gene might be linked to:

- Prostate cancer
- Glioblastoma
- Coronary heart disease
- Acute myeloid leukemia

CKS2 (Cyclin-dependent kinase subunit 2)

Function of this Gene:

-Pivotal role in cell cycle regulation, especially during cell division and proliferation. It binds to cyclin-regulated kinases to regulate their activity during the cell cycle.

How this gene is relevant in our data:

-Is the topmost significant upregulated gene in both males and females when using a log2 fold change cutoff of greater than 0.2.

Other diseases this gene might be linked to:

- Gastric cancer

- Hepatocellular carcinoma
- Colon cancer
- Osteosarcoma
- Meningioma

SUB1 (Positive Cofactor 4)

Function of this Gene:

- Protein coding gene that plays a pivotal role in transcription regulation, DNA repair, and genomic stability.

How this gene is relevant to our data:

- The second most significant upregulated gene in both males and females when using a log2 fold change cutoff of greater than 0.2.

Other diseases this gene might be linked to:

- Ovarian cancer
- Breast cancer
- Pancreatic ductal adenocarcinoma
- Atherosclerosis
- Prostate cancer
- Hepatoblastoma

COX7C (Cytochrome c oxidase subunit 7C)

Function of this Gene:

- Structural subunit of cytochrome c oxidase, which catalyzes the reduction of oxygen to water using electrons from cytochrome c.

How this gene is relevant to our data:

- The third most significant upregulated gene in both males and females when using a log2 fold change cutoff of greater than 0.2

Other diseases this gene might be linked to:

- Diabetes-related sepsis
- Cerebral ischemia
- Autoimmune uveitis

- Dementia
- Chronic Fatigue Syndrome

NA (sodium voltage-gated channel alpha subunit 9)

Function of this Gene:

- Encodes a sodium ion channel that generates and conducts action potentials in neurons. It amplifies small voltage changes helping neurons reach the threshold to fire.

How this gene is relevant to our data:

- Is the fourth most significant upregulated gene in both males and females when using a log2 fold change cutoff greater than 0.2.

Other diseases this gene might be linked to:

- Glioblastoma
- Epilepsy disorders
- Erythromelalgia
- Schizophrenia
- Bipolar Disorder

LY96 (Lymphocyte antigen 96)

Function of this Gene:

- Encodes a protein that plays a pivotal role in innate immune system by helping the body detect and respond to Gram-negative bacterial infections.

How this gene is relevant in our data:

- Is the fifth most significant upregulated gene in both males and females when using a log2 fold change cutoff greater than 0.2.

Other diseases this gene might be linked to:

- Glioma
- Childhood leukemia
- Colon cancer
- Coronavirus

UBL5 (Ubiquitin-Like 5)

Function of this Gene:

- Encodes a small protein to modulate protein function and stability through non-covalent interactions.

How this gene is relevant to our data:

- Is the topmost significant upregulated gene in females when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Neuroblastoma
- Alzheimer's disease
- Atherosclerosis
- Carcinogenesis
- Thyroid gland cancer

GGCX (Gamma-Glutamyl Carboxylase)

Function of this Gene:

- Encodes an enzyme that is essential for the post-translational modification of several vitamin K-dependent proteins.

How this gene is relevant in our data:

- Is the second most significant upregulated gene in females when using a log2 fold change cut off greater than 0.1.

Other diseases this gene might be linked to:

- Swine influenza virus
- Uremia
- Pulmonary Arterial Hypertension
- Vitamin K-dependent Bleeding Disorders

UQCRQ (ubiquinol-cytochrome c reductase complex III subunit VII)

Function of this Gene:

- A ubiquinone-binding protein that helps transfer electrons from ubiquinol to cytochrome c.

How this gene is relevant to our data:

- Is the third most significant upregulated gene in females when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Nonalcoholic Fatty liver disease
- Gastric cancer
- Acute pancreatitis
- Sepsis
- Diabetes
- Dementia

HINT3 (Histidine Triad Nucleotide Binding Protein 3)

Function of this Gene:

- Helps the body break down certain molecules that contain energy-linked parts called nucleotides, especially ones related to adenosine.

How this gene is relevant to our data:

- Is the fourth most significant upregulated gene in females when using a log2 fold change cut off greater than 0.1.

Other diseases this gene might be linked to:

- Pulmonary Arterial Hypertension
- Multiple Sclerosis
- Breast cancer
- Gonorrhea
- Chlamydia
- Prostate cancer

CNIH4 (Cornichon Family Member 4)

Function of this Gene:

- Helps certain cell receptors travel from inside the cell (in a place called the endoplasmic reticulum) to the cell surface.

How this gene is relevant to our data:

- Is the fifth most significant upregulated gene in females when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Breast cancer
- Glioma
- Cervical cancer
- Colon cancer
- Hepatocellular carcinoma

SPTBN1 (spectrin beta, non-erythrocytic 1)

Function of this Gene:

- Encodes a structural protein that helps maintain the shape, stability, and organization of cells, especially in the brain, liver, and heart.

How this gene is relevant to our data:

- This gene is the topmost significant downregulated gene in females when using a log2fold change cutoff greater than 0.1

Other diseases this gene might be linked to:

- Primary Osteoporosis
- Hepatocellular carcinoma
- Liver disease
- Colon cancer

SRRM2 (serine/arginine repetitive matrix 2)

Functions of this Gene:

- Helps your cells edit and process RNA, which is the messenger that carries instructions from DNA to make proteins.

How this gene is relevant to our data:

-Second most significant downregulated gene in females when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Ovarian cancer
- Alzheimer's disease
- Colon adenocarcinoma

WNK1 (With No Lysine [K] 1)

Function of this Gene:

-Helps your body keep the right balance of salt and water, which is super important for things like blood pressure, nerve signals, and cell health.

How this gene is relevant to our data:

-Is the third most significant downregulated gene in females when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Leukemia
- Ovarian cancer
- Hepatocellular Carcinoma

IKZF3 (IKAROS family zinc finger 3)

Function of this Gene:

-Helps control how certain immune cells grow and develop—especially B cells, which make antibodies to fight infections.

How this gene is relevant to our data:

-Fourth most significant downregulated gene in females when using a log2 fold change cutoff of greater than 0.1.

Other diseases this gene might be linked to:

- Head and neck squamous cell carcinoma
- Gastric cancer
- Systemic Lupus Erythematosus
- Lenalidomide

ZFX (zinc finger protein X-linked)

Function of this Gene:

-Helps control how certain cells grow, divide, and stay healthy, especially stem cells and immune cells.

How this gene is relevant to our data:

-Tied for topmost significant upregulated gene (with XIST) in males when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Leukemia
- Colorectal cancer
- Non-small cell lung cancer
- Breast cancer
- Prostate cancer

KDM6A (lysine demethylase 6a)

Function of this Gene:

-Helps your body turn certain genes on or off by changing how DNA is packaged.

How this gene is relevant to our data:

-Is the second most significant upregulated gene in males when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Pancreatic Cancer
- Acute myeloid leukemia
- Bladder cancer

PLA2G12A (phospholipase A2 group XIIA)

Function of the Gene:

-Makes a protein that helps your body break down fats in cell membranes—especially during inflammation or when fighting bacterial infections.

How this gene is relevant to our data:

-Is the fourth most significant upregulated gene in males (tied with XIST) when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Colorectal cancer
- Acute myocardial infarction
- Asthma

KIF2A (kinesin family member 2a)

Function of the Gene:

-Helps cells move things around and divide properly, especially in the brain.

How this gene is relevant to our data:

-Is the fifth most significant upregulated gene in males when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Neurodegeneration
- Non-small cell lung cancer
- Breast cancer
- Hepatocellular carcinoma

UTY (ubiquitously transcribed tetratricopeptide repeat containing, Y-linked)

Function of this Gene:

- Helps regulate how certain genes are turned on or off, especially during development.

How this gene is relevant to our data:

-Is the topmost significant downregulated gene in males (tied with TXLNGY) when using a log2 fold change cutoff greater than 0.1.

Other diseases this gene might be linked to:

- Pulmonary Hypertension
- Heart failure
- Bladder cancer
- Atherosclerosis