

Portal 1. Song System Markers Portal Classification.

Song nucleus or Nucleus subregion (Parent nucleus)

HVC - HVC proper name

paraHVC (HVC)

Sparse cells in HVC (HVC)

RA - Robust Nucleus of the Arcopallium

Sparse cells in RA (RA)

X - Area X

Sparse cells in Area X (X)

LMAN - Lateral Magnocellular Nucleus of the Anterior Nidopallium

LMANco - Core of the Lateral Magnocellular Nucleus of the Anterior Nidopallium (LMAN)

LMANsh - Shell of the Lateral Magnocellular Nucleus of the Anterior Nidopallium (LMAN)

Sparse cells in LMAN (LMAN)

MMAN - Medial Magnocellular Nucleus of the Anterior Nidopallium

Nif - Interfacial Nucleus

DLM - Medial Part of the Dorsolateral Nucleus of the Anterior Thalamus

DM - Dorsomedial Part of the Intercollicular Nucleus

Uva - Nucleus Uvaeformis

Portal 2. Speech and Language Portal Classification.

Topic or Attribute (Parent Organizing Theme)

FOXP2 (Highlighted Genes)

CNTNAP2 (Highlighted Genes)

Vernes et al., 2007 (FoxP2 Targets)

Konopka et al., 2009 (FoxP2 Targets)

Spiteri et al., 2007 (FoxP2 Targets)

OMIM Autism Spectrum Disorders (Autism Spectrum Disorders)

SFARI High Confidence (Autism Spectrum Disorders)

SFARI Strong Candidate (Autism Spectrum Disorders)

SFARI Suggestive Evidence (Autism Spectrum Disorders)

OMIM Deafness (Disorders)

Developmental Verbal Dyspraxia (Disorders)

Peter et al., 2014 (Childhood Apraxia of Speech)

Worthey et al., 2013 (Childhood Apraxia of Speech)

OMIM Dyslexia (Dyslexia)

Couto et al., 2008 (Dyslexia (Current Literature))

Jimenez-Bravo, Marrero, and Benitez-Burraco, 2017 (Dyslexia (Hypothesis))

OMIM Language Impairment with Mental Retardation (Disorders)

Murphy and Benitez-Burraco, 2016 (Hypothesis) (Schizophrenia Related Speech Disorders)

SLI (OMIM) - Specific Language Impairment (Specific Language Impairment)

Newbury et al., 2009 (SLI Current Literature))

Stuttering (Disorders)

Raza et al., 2013 (Stuttering Current Literature)

Kang et al., 2010 (Stuttering Current Literature)

Riaz et al., 2005 (Stuttering Current Literature)

Pal et al., 2010 (Speech Disorder Associated with Rolandic Epilepsy)

Murphy and Benitez-Burraco, 2016 (Language Readiness Hypothesis)

Pfenning et al., 2014 (RA-Laryngeal Cortex)

Pfenning et al., 2014 (Area X-Striatum)

Portal 4. Comparative Neuroanatomy Portal Classification.

Portal 4A. Bird Brain Marker Sub-portal Classification.

Telencephalon (General) (Telencephalon)
 Pallium (General) (Pallium (Pal))
 Arcopallium (General) (Arcopallium (A))
 Anterior Arcopallium (AA) (Arcopallium (A))
 Dorsal Arcopallium (AD) (Arcopallium (A))
 Intermediate Arcopallium (AI) (Arcopallium (A))
 Medial Arcopallium (AM) (Arcopallium (A))
 Posterior Arcopallium (AP) (Arcopallium (A))
 Ventral Arcopallium (AV) (Arcopallium (A))
 Dorsolateral Corticoid Area (CDL) (Pallium (Pal))
 Core of the Dorsolateral Corticoid Area (CDLco) (Dorsolateral Corticoid Area (CDL))
 HF (General) (Hippocampal Formation (HF))
 HP (General) (Hippocampus (HP))
 Dorsocaudal Hippocampus (HPdc) (Hippocampus (HP))
 APH (General) (Area Parahippocampus (APH))
 Dorsal part of the Area Parahippocampus (APHd) (Area Parahippocampus (APH))
 Ventral Part of the Area Parahippocampus (APHv) (Area Parahippocampus (APH))
 Dentate Gyrus (DG) (Hippocampal Formation (HF))
 Hyperpallium (General) (Hyperpallium (H))
 Mesopallium (General) (Mesopallium (M))
 Caudal Mesopallium (CM) (Mesopallium (M))
 Dorsomedial Mesopallium (Mdm) (Mesopallium (M))
 Ventromedial Mesopallium (Mvm) (Mesopallium (M))
 Nidopallium (General) (Nidopallium (N))
 Caudolateral Nidopallium (NCL) (Nidopallium (N))
 NCM (General) (Caudomedial Nidopallium (NCM))
 Caudal Part of the Caudomedial Nidopallium (cNCM) (Caudomedial Nidopallium (NCM))
 Rostral Part of the Caudomedial Nidopallium (rNCM) (Caudomedial Nidopallium (NCM))
 Sparse Cells of the Caudomedial Nidopallium (Caudomedial Nidopallium (NCM))
 Ni (General) (Intermediate Nidopallium (Ni))
 Dorsal Part of the Intermediate Nidopallium (NiD) (Intermediate Nidopallium (Ni))
 Ventral Part of the Intermediate Nidopallium (NiV) (Intermediate Nidopallium (Ni))
 Shelf Region (Sh) (Nidopallium (N))
 Olfactory Bulb (General) (Olfactory Bulb)
 Glomerular Layer of the Olfactory Bulb (GL) (Olfactory Bulb)
 Granule Cell Layer of the Olfactory Bulb (Olfactory Bulb)
 Periventricular Region (Pallium (Pal))
 Sparse Cells of the Pallium (Pallium (Pal))
 Bas (General) (Basorostral Nucleus (Bas))
 Sparse Cells of the Basorostral Nucleus (Basorostral Nucleus (Bas))
 Entopallium (General) (Entopallium (E))
 Core of the Entopallium (Eco) (Entopallium (E))

Shell of the Entopallium (Esh) (Entopallium (E))
 Sparse Cells of the Entopallium (Entopallium (E))
 Field L (General) (Field L)
 L2a Subfield of Field L (Field L)
 L2a Subfield of Field L (Field L)
 L2b Subfield of Field L (Field L)
 L3 Subfield of Field L (Field L)
 Nucleus Basalis of Meynert (B) (Basal Forebrain)
 Nucleus of the Anterior Commissure (CAn) (Basal Forebrain)
 Nucleus of the Vertical Limb of the Diagonal Band (VDB) (Basal Forebrain)
 EP (General) (Entopeduncular Nucleus (EP))
 Dorsal Part of the Entopeduncular Nucleus (EPD) (Entopeduncular Nucleus (EP))
 Globus Pallidus (GP) (Pallidum (P))
 Ventral Pallidum (VP) (Pallidum (P))
 Septum (General) (Septum (S))
 Lateral Septum (SL) (Septum (S))
 Medial Septal Nucleii (SM) (Septum (S))
 Rostral Septum (SR) (Septum (S))
 St (General) (Striatum (St))
 Caudal Striatum (CSt) (Striatum (St))
 Intrapeduncular Nucleus (InP) (Striatum (St))
 Lateral Striatum (LSt) (Striatum (St))
 Medial Striatum (MSt) (Striatum (St))
 Nucleus Accumbens (Acc) (Striatum (St))
 Sparse Cells of the Striatum (Striatum (St))
 Hb (General) (Habenula (Hb))
 Lateral Habenular Nucleus (HbL) (Habenula (Hb))
 Medial Habenular Nucleus (HbM) (Habenula (Hb))
 Subhabenula (SHb) (Epithalamus)
 Anterior Medialis Nucleus of the Hypothalamus (AM) (Hypothalamus)
 Arcuate Nucleus of the Hypothalamus (Arc) (Hypothalamus)
 Lateral Hypothalamus (Lhy) (Hypothalamus)
 Paraventricular Nucleus (PVN) (Hypothalamus)
 Suprachiasmatic Nucleus of the Hypothalamus (SCN) (Hypothalamus)
 Supraoptic Nucleus (SON) (Hypothalamus)
 Tuberal Nucleus (Tu) (Hypothalamus)
 Ventromedial Nucleus of the Hypothalamus (VMH) (Hypothalamus)
 Pretectal Area (Diencephalon)
 Medial Pretectal Nucleus (MPT) (Pretectal Area)
 Pretectal Nucleus (Pt) (Pretectal Area)
 Nucleus Spiriformis Lateralis (SpL) (Pretectal Area)
 Nucleus Spiriformis Medialis (SpM) (Pretectal Area)
 Subpretectal Nucleus (SPT) (Pretectal Area)
 Posterior Nucleus of the Ansa Lenticularis (Alp) (Thalamus)
 Dorsolateral Nucleus of the Anterior Thalamus (DLA) (Thalamus)
 Dorsolateral Nucleus of the Posterior Thalamus (DLP) (Thalamus)

DMA (General) (Dorsomedial Nucleus of the Anterior Thalamus (DMA))
 Shell of the Dorsomedial Nucleus of the Anterior Thalamus (DMAsh) (Dorsomedial Nucleus of the Anterior Thalamus)
 Dorsomedial Nucleus of the Posterior Thalamus (DMP) (Thalamus)
 Ventral Part of the Lateral Geniculate Nucleus (GLv) (Thalamus)
 Intermedioposterior Nucleus (IPo) (Thalamus)
 Nucleus Ovoidalis (General) (Nucleus Ovoidalis (Ov))
 Core of Nucleus Ovoidalis (Ovco) (Nucleus Ovoidalis (Ov))
 Shell of Nucleus Ovoidalis (Ovsh) (Nucleus Ovoidalis (Ov))
 Medial Part of Nucleus Ovoidalis (Ovm) (Nucleus Ovoidalis (Ov))
 Oval Pregeniculate Nucleus (OvPG) (Thalamus)
 Perirhinal Area (pRt) (Thalamus)
 Reticular Nucleus of the Thalamus (Ret) (Thalamus)
 Nucleus Rotundus (Rt) (Thalamus)
 Superficial Microcellular Nucleus of the Thalamus (SMi) (Thalamus)
 Parvocellular Part of the Superficial Nucleus of the Thalamus (SPc) (Thalamus)
 Nucleus Subrotundus (SRt) (Thalamus)
 Subthalamic Nucleus (STN) (Thalamus)
 Subgeniculate Nucleus (SubG) (Thalamus)
 Nucleus Triangularis (T) (Thalamus)
 Is (General) (Isthmic Nucleus (Is))
 Magnocellular Part of the Isthmic Nucleus (Imc) (Isthmic Nucleus (Is))
 Parvocellular Part of the Isthmic Nucleus (Ipc) (Isthmic Nucleus (Is))
 Isthmo-optic Nucleus (IsO) (Isthmus)
 Locus Coeruleus (LoC) (Isthmus)
 Tectum (Mesencephalon)
 ICo (General) (Intercollicular Nucleus (ICo))
 Dorsal Part of the Lateral Mesencephalic Nucleus (MLd) (Intercollicular Nucleus (ICo))
 Dorsal Part of the Lateral Lemniscal Nucleus (LLD) (Tectum)
 LM (General) (Lentiform Nucleus of the Mesencephalon (LM))
 Magnocellular Division of the Lentiform Nucleus of the Mesencephalon (LMmc) (Lentiform Nucleus of the Mesencephalon)
 Parvocellular Division of the Lentiform Nucleus of the Mesencephalon (LMpc) (Lentiform Nucleus of the Mesencephalon)
 Mesencephalic Nucleus of the Trigeminal Nerve (n5m) (Tectum)
 Stratum Album Centrale (SAC) (Tectum)
 Stratum Griseum Centrale (SGC) (Tectum)
 Stratum Griseum et Fibrosum (SGF) (Tectum)
 Semilunar Nucleus (SLu) (Tectum)
 Stratum Opticum (SOp) (Tectum)
 Dorsal Raphe Nucleus (DR) (Tegmentum)
 Ectomammillary Nucleus (EM) (Tegmentum)
 Nucleus of Edinger-Westphal (EW) (Tegmentum)
 Lateral Reticular Formation of the Mesencephalon (FRL) (Tegmentum)
 Interstitial Nucleus of Cajal (InC) (Tegmentum)
 Dorsal Part of the Nucleus of the Oculomotor Nerve (n3d) (Tegmentum)
 Ventral Part of the Nucleus of the Oculomotor Nerve (n3v) (Tegmentum)
 Nucleus of the Trochlear Nerve (n4) (Tegmentum)
 Periaqueductal Gray (PAG) (Tegmentum)

Red Nucleus (Ru) (Tegmentum)
Substantia Nigra (SN) (Tegmentum)
Ventral Tegmental Area (VTA) (Tegmentum)
Cb (General) (Cerebellum (Cb))
Cb (gcl) (General) (Granule Cell Layer of the Cerebellum (Cb (gcl)))
Dense Cells in the Granule Cell Layer of the Cerebellum (Cb (gcl) dense) (Granule Cell Layer of the Cerebellum (Cb (gcl)))
Sparse Cells in the Granule Cell Layer of the Cerebellum (Cb (gcl) sparse) (Granule Cell Layer of the Cerebellum (Cb (gcl)))
Cb (dn) (General) (Deep Nuclei of the Cerebellum (Cb (dn)))
Internal Cerebellar Nucleus (CbI) (Deep Nuclei of the Cerebellum (Cb (dn)))
Lateral Cerebellar Nucleus (CbL) (Deep Nuclei of the Cerebellum (Cb (dn)))
Medial Cerebellar Nucleus (CbM) (Deep Nuclei of the Cerebellum (Cb (dn)))
Molecular Cell Layer of the Cerebellum (Cb (mcl)) (Cerebellum (Cb))
Purkinje Cell Layer of the Cerebellum (Cb (pcl)) (Cerebellum (Cb))
Principal Sensory Nucleus of the Trigeminal Nerve (n5p) (Pons (Pn))
Nucleus of the Abducens Nerve (n6) (Pons (Pn))
Nucleus of the Facial Nerve (n7) (Pons (Pn))
Medial Pontine Nuclei (PM) (Pons (Pn))
Angular Nucleus (Ang) (Myelencephalon (Medulla))
Nucleus Laminaris (La) (Myelencephalon (Medulla))
Magnocellular Nucleus (MC) (Myelencephalon (Medulla))
Gigantocellular Part of the Reticular Nucleus of the Caudal Pons (RPgc) (Myelencephalon (Medulla))
Lateral Vestibular Nucleus (LVe) (Vestibular Nucleus)
Medial Vestibular Nucleus (MVe) (Vestibular Nucleus)
Spinal Vestibular Nucleus (SpVe) (Vestibular Nucleus)
Superior Vestibular Nucleus (SuVe) (Vestibular Nucleus)
Blood Vessels (Other structures)
Choroid Plexus (ChP) (Other structures)
Fiber Tracts, Laminae, and Commissures (Other structures)
Meninge (Pia Mater) (Other structures)
Ventricular Zone/Ependyma (General) (Ventricular Zone/Ependyma (V))

Portal 4A. Bird Brain Marker Sub-portal Classification.

Cortex (Cerebral Cortex Markers)
Cerebral Cortex 2-3 (Cerebral Cortex Markers)
Cerebral Cortex 4 (Cerebral Cortex Markers)
Cerebral Cortex 5 (Cerebral Cortex Markers)
Cerebral Cortex 6a (Cerebral Cortex Markers)
Cerebral Cortex 6b (Cerebral Cortex Markers)
Hippocampal region (Hippocampal Markers)
CA1 (Hippocampal Markers)
CA3 (Hippocampal Markers)
Dentate gyrus (Hippocampal Markers)
CA2 (Hippocampal Markers)
Claustrum (Mouse Brain Markers)
Central amygdalar nucleus (Amygdala)
Medial amygdalar nucleus (Amygdala)

Basolateral amygdalar nucleus (Amygdala)
Cortical amygdalar area (Amygdala)
Bed nuclei of the stria terminalis (Amygdala)
Striatum (General) (Striatum)
Caudoputamen (Striatum)
Nucleus Accumbens (Striatum)
Lateral septal nucleus (Septum)
Pallidum (Mouse Brain Markers)
Cerebellar cortex, Purkinje layer (Cerebellum)
Cerebellar cortex, Granular layer (Cerebellum)
Cerebellar nuclei (Cerebellum)
Thalamus (mouse) (Mouse Brain Markers)
Hypothalamus (mouse) (Mouse Brain Markers)
Substantia nigra (Neuromodulatory Cell Groups)
Ventral tegmental area (Neuromodulatory Cell Groups)
Dorsal nucleus raphe (Neuromodulatory Cell Groups)
Locus ceruleus (Neuromodulatory Cell Groups)

Portal 3. Diseases and Phenotypes Portal Classification.

Portal 3A. Human Diseases Classification.

Addiction (Neurological/Psychiatric Disorders)
Ataxia (Neurological/Psychiatric Disorders)
Epilepsy (Neurological/Psychiatric Disorders)
Mental Retardation (Neurological/Psychiatric Disorders)
Neurodegeneration (Neurological/Psychiatric Disorders)
Neuropathy (Neurological/Psychiatric Disorders)
Abnormal Muscle Control (Other Neurological/Psychiatric Disorders)
ADHD (Other Neurological/Psychiatric Disorders)
Alzheimers Disease (Other Neurological/Psychiatric Disorders)
Anorexia (Other Neurological/Psychiatric Disorders)
Antisocial Behaviors (Other Neurological/Psychiatric Disorders)
Anxiety (Other Neurological/Psychiatric Disorders)
Autism Related Disorders (Other Neurological/Psychiatric Disorders)
Dementia (Other Neurological/Psychiatric Disorders)
Depression (Other Neurological/Psychiatric Disorders)
Developmental Delay (Other Neurological/Psychiatric Disorders)
Dystonia (Other Neurological/Psychiatric Disorders)
Language Impairment (Other Neurological/Psychiatric Disorders)
Lissencephaly (Other Neurological/Psychiatric Disorders)
Migrane (Other Neurological/Psychiatric Disorders)
Myoclonic Dystonia (Other Neurological/Psychiatric Disorders)
Myoclonus (Other Neurological/Psychiatric Disorders)
Myokymia (Other Neurological/Psychiatric Disorders)
OCD (Other Neurological/Psychiatric Disorders)
Schizophrenia (Other Neurological/Psychiatric Disorders)
Seasonal Affective Disorder (Other Neurological/Psychiatric Disorders)
Specific Language Impairment (SLI) (Other Neurological/Psychiatric Disorders)
Stuttering Disorder Genes (Other Neurological/Psychiatric Disorders)
Other Neurological/Psychiatric Disorders (Neurological/Psychiatric Disorders)
Bone Diseases (Other Disorder)
Cancer (Other Disorder)
Cardiovascular Disorders (Other Disorder)
Cellular Disorders (Other Disorder)
Dermatological Conditions (Other Disorder)
Developmental Disorders (Other Disorder)
Endocrine Disorders (Other Disorder)
Eye Disorders (Other Disorder)
Fever (Other Disorder)
Deafness (Hearing Disorders)
Other Hearing Disorders (Hearing Disorders)
Hematologic Disorders (Other Disorder)
Kidney Disorders (Other Disorder)

Metabolic Disorders (Other Disorder)
 Muscular Disorders (Other Disorder)
 Musculoskeletal Disorders (Other Disorder)
 Other Non-Neurological Disorders (Other Disorder)
 Pigmentation Disorders (Other Disorder)
 Reproductive Disorders (Other Disorder)
 Respiratory Disorders (Other Disorder)
 Tumor (Other Disorder)

Portal 3B. Mouse Phenotypes Classification.

Abnormal Behavior Response to Light (Abnormal Behavior)
 Abnormal Circadian Phase (Abnormal Circadian Rhythm)
 Arrhythmic Circadian Persistence (Abnormal Circadian Rhythm)
 Delayed Circadian Phase (Abnormal Circadian Rhythm)
 Shortened Circadian Period (Abnormal Circadian Rhythm)
 Abnormal Active Avoidance Behavior (Abnormal Cognition)
 Abnormal Associative Learning (Abnormal Cognition)
 Abnormal Avoidance Learning Behavior (Abnormal Cognition)
 Abnormal Conditioned Taste Aversion Behavior (Abnormal Cognition)
 Abnormal Contextual Conditioning Behavior (Abnormal Cognition)
 Abnormal Cued Conditioning Behavior (Abnormal Cognition)
 Abnormal Discrimination Learning (Abnormal Cognition)
 Abnormal Dishabituation (Abnormal Cognition)
 Abnormal Exploration In A New Environment (Abnormal Cognition)
 Abnormal Eye Blink Conditioning Behavior (Abnormal Cognition)
 Abnormal Habituation (Abnormal Cognition)
 Abnormal Habituation To A New Environment (Abnormal Cognition)
 Abnormal Habituation To A Novel Odor (Abnormal Cognition)
 Abnormal Inhibitory Learning (Abnormal Cognition)
 Abnormal Latent Inhibition Of Conditioning Behavior (Abnormal Cognition)
 Abnormal Learning/Memory/Conditioning (Abnormal Cognition)
 Abnormal Long Term Object Recognition Memory (Abnormal Cognition)
 Abnormal Long Term Spatial Reference Memory (Abnormal Cognition)
 Abnormal Motor Learning (Abnormal Cognition)
 Abnormal Object Recognition Memory (Abnormal Cognition)
 Abnormal Olfactory -Discrimination Memory (Abnormal Cognition)
 Abnormal Operant Conditioning Behavior (Abnormal Cognition)
 Abnormal Passive Avoidance Behavior (Abnormal Cognition)
 Abnormal Response To New Environment (Abnormal Cognition)
 Abnormal Short Term Object Recognition Memory (Abnormal Cognition)
 Abnormal Short Term Spatial Reference Memory (Abnormal Cognition)
 Abnormal Spatial Learning (Abnormal Cognition)
 Abnormal Spatial Reference Memory (Abnormal Cognition)
 Abnormal Spatial Working Memory (Abnormal Cognition)
 Cognitive Inflexibility (Abnormal Cognition)
 Decreased Exploration In New Environment (Abnormal Cognition)

Enhanced Active Avoidance Behavior (Abnormal Cognition)
Enhanced Contextual Conditioning Behavior (Abnormal Cognition)
Enhanced Cued Conditioning Behavior (Abnormal Cognition)
Enhanced Learning (Abnormal Cognition)
Enhanced Passive Avoidance Behavior (Abnormal Cognition)
Enhanced Spatial Learning (Abnormal Cognition)
Impaired Conditioned Place Preference Behavior (Abnormal Cognition)
Impaired Contextual Conditioning Behavior (Abnormal Cognition)
Impaired Cued Conditioning Behavior (Abnormal Cognition)
Impaired Learning (Abnormal Cognition)
Impaired Passive Avoidance Behavior (Abnormal Cognition)
Impaired Social Transmission Of Food Preference (Abnormal Cognition)
Impaired Spatial Learning (Abnormal Cognition)
Increased Exploration In New Environment (Abnormal Cognition)
Novel Environmental Response-Related Retropulsion (Abnormal Cognition)
Abnormal Eating Behavior (Abnormal Consumption Behavior)
Abnormal Food Intake (Abnormal Consumption Behavior)
Abnormal Food Preference (Abnormal Consumption Behavior)
Abnormal Liquid Preference (Abnormal Consumption Behavior)
Abnormal Mastication (Abnormal Consumption Behavior)
Abnormal Suckling Behavior (Abnormal Consumption Behavior)
Absent Gastric Milk In Neonates (Abnormal Consumption Behavior)
Aphagia (Abnormal Consumption Behavior)
Decreased Fluid Intake (Abnormal Consumption Behavior)
Decreased Food Intake (Abnormal Consumption Behavior)
Dysphagia (Abnormal Consumption Behavior)
Increased Compensatory Feeding Amount (Abnormal Consumption Behavior)
Increased Fluid Intake (Abnormal Consumption Behavior)
Increased Food Intake (Abnormal Consumption Behavior)
Low Sweet Preference (Abnormal Consumption Behavior)
No Suckling Reflex (Abnormal Consumption Behavior)
No Swallowing Reflex (Abnormal Consumption Behavior)
Polydipsia (Abnormal Consumption Behavior)
Polyphagia (Abnormal Consumption Behavior)
Abnormal Aggression-Related Behavior (Abnormal Emotion/Affect Behavior)
Abnormal Anxiety-Related Response (Abnormal Emotion/Affect Behavior)
Abnormal Depression-Related Behavior (Abnormal Emotion/Affect Behavior)
Abnormal Fear/Anxiety-Related Behavior (Abnormal Emotion/Affect Behavior)
Abnormal Response To Novel Object (Abnormal Emotion/Affect Behavior)
Abnormal Response To Novelty (Abnormal Emotion/Affect Behavior)
Abnormal Response To Social Novelty (Abnormal Emotion/Affect Behavior)
Behavioral Despair (Abnormal Emotion/Affect Behavior)
Decreased Aggression (Abnormal Emotion/Affect Behavior)
Decreased Aggression Towards Males (Abnormal Emotion/Affect Behavior)
Decreased Aggression Towards Mice (Abnormal Emotion/Affect Behavior)
Decreased Anxiety-Related Response (Abnormal Emotion/Affect Behavior)

Decreased Coping Response (Abnormal Emotion/Affect Behavior)
Decreased Fear-Related Response (Abnormal Emotion/Affect Behavior)
Increased Aggression Towards Females (Abnormal Emotion/Affect Behavior)
Increased Aggression Towards Humans (Abnormal Emotion/Affect Behavior)
Increased Aggression Towards Males (Abnormal Emotion/Affect Behavior)
Increased Aggression Towards Mice (Abnormal Emotion/Affect Behavior)
Increased Anxiety-Related Response (Abnormal Emotion/Affect Behavior)
Increased Coping Response (Abnormal Emotion/Affect Behavior)
Increased Fear-Related Response (Abnormal Emotion/Affect Behavior)
Increased Response To Stress-Induced Hyperthermia (Abnormal Emotion/Affect Behavior)
Increased Thigmotaxis (Abnormal Emotion/Affect Behavior)
Submission Towards Male Mice (Abnormal Emotion/Affect Behavior)
Abnormal Allogrooming Behavior (Abnormal Grooming Behavior)
Decreased Grooming Behavior (Abnormal Grooming Behavior)
Excessive Scratching (Abnormal Grooming Behavior)
Increased Grooming Behavior (Abnormal Grooming Behavior)
Poor Grooming (Abnormal Grooming Behavior)
Abnormal Eye Movement (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Gait (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Grip Strength (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Head Movements (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Horizontal Vestibuloocular Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Involuntary Movement (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Limb Posture (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Locomotor Activation (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Locomotor Behavior (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Locomotor Coordination (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Motor Coordination/ Balance (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Optokinetic Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Physical Strength (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Pilomotor Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Pinna Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Placing Response (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Postural Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Posture (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Pupillary Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Response To Tactile Stimuli (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Resting Posture (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Startle Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Stationary Movement (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Tail Movements (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Vertical Vestibuloocular Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Vestibulocollic Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Vestibuloocular Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Vibrissae Reflex (Abnormal Motor Capabilities/Coordination/Movement)

Abnormal Voluntary Movement (Abnormal Motor Capabilities/Coordination/Movement)
Absent Pinna Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Absent Startle Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Absent Vestibuloocular Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Akinesia (Abnormal Motor Capabilities/Coordination/Movement)
Altered Righting Response (Abnormal Motor Capabilities/Coordination/Movement)
Ataxia (Mouse) (Abnormal Motor Capabilities/Coordination/Movement)
Athetotic Walking Movements (Abnormal Motor Capabilities/Coordination/Movement)
Behavioral Arrest (Abnormal Motor Capabilities/Coordination/Movement)
Bidirectional Circling (Abnormal Motor Capabilities/Coordination/Movement)
Bradykinesia (Abnormal Motor Capabilities/Coordination/Movement)
Carpoptosis (Abnormal Motor Capabilities/Coordination/Movement)
Circling (Abnormal Motor Capabilities/Coordination/Movement)
Decreased Grip Strength (Abnormal Motor Capabilities/Coordination/Movement)
Decreased Startle Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Decreased Vertical Activity (Abnormal Motor Capabilities/Coordination/Movement)
Dystonia (Abnormal Motor Capabilities/Coordination/Movement)
Enhanced Coordination (Abnormal Motor Capabilities/Coordination/Movement)
Forelimb Paralysis (Abnormal Motor Capabilities/Coordination/Movement)
Head Bobbing (Abnormal Motor Capabilities/Coordination/Movement)
Head Shaking (Abnormal Motor Capabilities/Coordination/Movement)
Head Tilt (Abnormal Motor Capabilities/Coordination/Movement)
Head Tossing (Abnormal Motor Capabilities/Coordination/Movement)
Hindlimb Paralysis (Abnormal Motor Capabilities/Coordination/Movement)
Hunched Posture (Abnormal Motor Capabilities/Coordination/Movement)
Hyperactivity (Abnormal Motor Capabilities/Coordination/Movement)
Hyperekplexia (Abnormal Motor Capabilities/Coordination/Movement)
Hyperresponsive To Tactile Stimuli (Abnormal Motor Capabilities/Coordination/Movement)
Hypoactivity (Abnormal Motor Capabilities/Coordination/Movement)
Hyporesponsive To Tactile Stimuli (Abnormal Motor Capabilities/Coordination/Movement)
Impaired Balance (Abnormal Motor Capabilities/Coordination/Movement)
Impaired Coordination (Abnormal Motor Capabilities/Coordination/Movement)
Impaired Limb Coordination (Abnormal Motor Capabilities/Coordination/Movement)
Impaired Pupillary Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Impaired Righting Response (Abnormal Motor Capabilities/Coordination/Movement)
Impaired Swimming (Abnormal Motor Capabilities/Coordination/Movement)
Improved Righting Response (Abnormal Motor Capabilities/Coordination/Movement)
Increased Grip Strength (Abnormal Motor Capabilities/Coordination/Movement)
Increased Horizontal Stereotypic Behavior (Abnormal Motor Capabilities/Coordination/Movement)
Increased Startle Reflex (Abnormal Motor Capabilities/Coordination/Movement)
Increased Stereotypic Behavior (Abnormal Motor Capabilities/Coordination/Movement)
Increased Vertical Activity (Abnormal Motor Capabilities/Coordination/Movement)
Increased Vertical Stereotypic Behavior (Abnormal Motor Capabilities/Coordination/Movement)
Induced Hyperactivity (Abnormal Motor Capabilities/Coordination/Movement)
Jerky Movement (Abnormal Motor Capabilities/Coordination/Movement)
Lethargy (Abnormal Motor Capabilities/Coordination/Movement)

Limb Grasping (Abnormal Motor Capabilities/Coordination/Movement)
Limp Posture (Abnormal Motor Capabilities/Coordination/Movement)
Long Stride Length (Abnormal Motor Capabilities/Coordination/Movement)
No Spontaneous Movement (Abnormal Motor Capabilities/Coordination/Movement)
Opisthotonus (Abnormal Motor Capabilities/Coordination/Movement)
Paralysis (Abnormal Motor Capabilities/Coordination/Movement)
Paraparesis (Abnormal Motor Capabilities/Coordination/Movement)
Paresis (Abnormal Motor Capabilities/Coordination/Movement)
Positive Geotaxis (Abnormal Motor Capabilities/Coordination/Movement)
Retropulsion (Abnormal Motor Capabilities/Coordination/Movement)
Short Stride Length (Abnormal Motor Capabilities/Coordination/Movement)
Spasticity (Abnormal Motor Capabilities/Coordination/Movement)
Spinning (Abnormal Motor Capabilities/Coordination/Movement)
Stereotypic Behavior (Abnormal Motor Capabilities/Coordination/Movement)
Straub Tail (Abnormal Motor Capabilities/Coordination/Movement)
Tremors (Abnormal Motor Capabilities/Coordination/Movement)
Trunk Curl (Abnormal Motor Capabilities/Coordination/Movement)
Unidirectional Circling (Abnormal Motor Capabilities/Coordination/Movement)
Unresponsive To Tactile Stimuli (Abnormal Motor Capabilities/Coordination/Movement)
Weakness (Abnormal Motor Capabilities/Coordination/Movement)
Abnormal Huddling Behavior (Abnormal Social/Conspecific Interaction)
Abnormal Maternal Nurturing (Abnormal Social/Conspecific Interaction)
Abnormal Mating Frequency (Abnormal Social/Conspecific Interaction)
Abnormal Nest Building Behavior (Abnormal Social/Conspecific Interaction)
Abnormal Nursing (Abnormal Social/Conspecific Interaction)
Abnormal Pup Retrieval (Abnormal Social/Conspecific Interaction)
Abnormal Sexual Interaction (Abnormal Social/Conspecific Interaction)
Abnormal Social Investigation (Abnormal Social/Conspecific Interaction)
Pup Cannibalization (Abnormal Social/Conspecific Interaction)
Reduced Male Mating Frequency (Abnormal Social/Conspecific Interaction)
Social Withdrawal (Abnormal Social/Conspecific Interaction)
Decreased Vocalization (Abnormal Vocalization)
Excessive Vocalization (Abnormal Vocalization)
Abnormal Seizure Response To Electrical Stimulation (Seizures)
Abnormal Seizure Response To Inducing Agent (Seizures)
Abnormal Spike Wave Discharge (Seizures)
Absence Seizures (Seizures)
Audiogenic Seizures (Seizures)
Clonic Seizures (Seizures)
Convulsive Seizures (Seizures)
Environmentally Induced Seizures (Seizures)
Increased Susceptibility To Induction Of Seizure By Inducing Agent (Seizures)
Maximal Tonic Hindlimb Extension Seizures (Seizures)
Myoclonus (Seizures)
Sporadic Seizures (Seizures)
Tonic Seizures (Seizures)

Tonic-Clonic Seizures (Seizures)

Abnormal Adenohypophysis Morphology (Abnormal Brain Morphology)
Abnormal Ammon Gyrus Morphology (Abnormal Brain Morphology)
Abnormal Amygdala Morphology (Abnormal Brain Morphology)
Abnormal Anterior Commissure Morphology (Abnormal Brain Morphology)
Abnormal Auditory Cortex Morphology (Abnormal Brain Morphology)
Abnormal Barrel Cortex Morphology (Abnormal Brain Morphology)
Abnormal Basal Ganglion Morphology (Abnormal Brain Morphology)
Abnormal Brain Commissure Morphology (Abnormal Brain Morphology)
Abnormal Brain Development (Abnormal Brain Morphology)
Abnormal Brain Internal Capsule Morphology (Abnormal Brain Morphology)
Abnormal Brain Interneuron Morphology (Abnormal Brain Morphology)
Abnormal Brain Iron Level (Abnormal Brain Morphology)
Abnormal Brain Size (Abnormal Brain Morphology)
Abnormal Brain Vasculature Morphology (Abnormal Brain Morphology)
Abnormal Brain Ventricle Morphology (Abnormal Brain Morphology)
Abnormal Brain Ventricular System Morphology (Abnormal Brain Morphology)
Abnormal Brain White Matter Morphology (Abnormal Brain Morphology)
Abnormal Brainstem Morphology (Abnormal Brain Morphology)
Abnormal Cerebellar Cortex Morphology (Abnormal Brain Morphology)
Abnormal Cerebellar Foliation (Abnormal Brain Morphology)
Abnormal Cerebellar Granule Cell Morphology (Abnormal Brain Morphology)
Abnormal Cerebellar Granule Layer Morphology (Abnormal Brain Morphology)
Abnormal Cerebellar Lobule Formation (Abnormal Brain Morphology)
Abnormal Cerebellar Molecular Layer (Abnormal Brain Morphology)
Abnormal Cerebellar Purkinje Cell Layer (Abnormal Brain Morphology)
Abnormal Cerebellum Anterior Vermis Morphology (Abnormal Brain Morphology)
Abnormal Cerebellum Development (Abnormal Brain Morphology)
Abnormal Cerebellum External Granule Cell Layer Morphology (Abnormal Brain Morphology)
Abnormal Cerebellum Morphology (Abnormal Brain Morphology)
Abnormal Cerebellum Posterior Vermis Morphology (Abnormal Brain Morphology)
Abnormal Cerebellum Vermis Morphology (Abnormal Brain Morphology)
Abnormal Cerebral Aqueduct Morphology (Abnormal Brain Morphology)
Abnormal Cerebral Cortex Morphology (Abnormal Brain Morphology)
Abnormal Cerebral Hemisphere Morphology (Abnormal Brain Morphology)
Abnormal Choroid Plexus Morphology (Abnormal Brain Morphology)
Abnormal Corpus Callosum Morphology (Abnormal Brain Morphology)
Abnormal Cortical Intermediate Zone Morphology (Abnormal Brain Morphology)
Abnormal Cortical Marginal Zone Morphology (Abnormal Brain Morphology)
Abnormal Cortical Plate Morphology (Abnormal Brain Morphology)
Abnormal Cortical Ventricular Zone Morphology (Abnormal Brain Morphology)
Abnormal Dentate Gyrus Morphology (Abnormal Brain Morphology)
Abnormal Diencephalon Morphology (Abnormal Brain Morphology)
Abnormal Dorsal Striatum Morphology (Abnormal Brain Morphology)
Abnormal Dorsal Telencephalic Commissure Morphology (Abnormal Brain Morphology)
Abnormal Entorhinal Cortex Morphology (Abnormal Brain Morphology)

Abnormal Facial Motor Nucleus Morphology (Abnormal Brain Morphology)
Abnormal Forebrain Development (Abnormal Brain Morphology)
Abnormal Forebrain Morphology (Abnormal Brain Morphology)
Abnormal Frontal Lobe Morphology (Abnormal Brain Morphology)
Abnormal Globus Pallidus Morphology (Abnormal Brain Morphology)
Abnormal Gonadotroph Morphology (Abnormal Brain Morphology)
Abnormal Hindbrain Development (Abnormal Brain Morphology)
Abnormal Hindbrain Morphology (Abnormal Brain Morphology)
Abnormal Hippocampal Mossy Fiber Morphology (Abnormal Brain Morphology)
Abnormal Hippocampus Ca1 Region Morphology (Abnormal Brain Morphology)
Abnormal Hippocampus Ca2 Region Morphology (Abnormal Brain Morphology)
Abnormal Hippocampus Ca3 Region Morphology (Abnormal Brain Morphology)
Abnormal Hippocampus Ca4 Region Morphology (Abnormal Brain Morphology)
Abnormal Hippocampus Development (Abnormal Brain Morphology)
Abnormal Hippocampus Granule Cell Layer (Abnormal Brain Morphology)
Abnormal Hippocampus Layer Morphology (Abnormal Brain Morphology)
Abnormal Hippocampus Morphology (Abnormal Brain Morphology)
Abnormal Hippocampus Pyramidal Cell Layer (Abnormal Brain Morphology)
Abnormal Hypothalamus Morphology (Abnormal Brain Morphology)
Abnormal Lateral Geniculate Nucleus Morphology (Abnormal Brain Morphology)
Abnormal Limbic System Morphology (Abnormal Brain Morphology)
Abnormal Locus Ceruleus Morphology (Abnormal Brain Morphology)
Abnormal Medium Spiny Neuron Morphology (Abnormal Brain Morphology)
Abnormal Medulla Oblongata Morphology (Abnormal Brain Morphology)
Abnormal Melanotroph Morphology (Abnormal Brain Morphology)
Abnormal Midbrain Development (Abnormal Brain Morphology)
Abnormal Midbrain Morphology (Abnormal Brain Morphology)
Abnormal Midbrain Roof Plate Morphology (Abnormal Brain Morphology)
Abnormal Midbrain-Hindbrain Boundary Development (Abnormal Brain Morphology)
Abnormal Neocortex Morphology (Abnormal Brain Morphology)
Abnormal Occipital Lobe Morphology (Abnormal Brain Morphology)
Abnormal Olfactory Bulb Development (Abnormal Brain Morphology)
Abnormal Olfactory Bulb Morphology (Abnormal Brain Morphology)
Abnormal Olfactory Cortex Morphology (Abnormal Brain Morphology)
Abnormal Optic Tract Morphology (Abnormal Brain Morphology)
Abnormal Orbitofrontal Cortex Morphology (Abnormal Brain Morphology)
Abnormal Parietal Lobe Morphology (Abnormal Brain Morphology)
Abnormal Pituitary Gland Development (Abnormal Brain Morphology)
Abnormal Pituitary Gland Morphology (Abnormal Brain Morphology)
Abnormal Pons Morphology (Abnormal Brain Morphology)
Abnormal Postnatal Subventricular Zone Morphology (Abnormal Brain Morphology)
Abnormal Purkinje Cell Dendrite Morphology (Abnormal Brain Morphology)
Abnormal Purkinje Cell Morphology (Abnormal Brain Morphology)
Abnormal Putamen Morphology (Abnormal Brain Morphology)
Abnormal Rostral Migratory Stream Morphology (Abnormal Brain Morphology)
Abnormal Somatosensory Cortex Morphology (Abnormal Brain Morphology)

Abnormal Stratification In Cerebral Cortex (Abnormal Brain Morphology)
Abnormal Striatum Morphology (Abnormal Brain Morphology)
Abnormal Substantia Nigra Morphology (Abnormal Brain Morphology)
Abnormal Subthalamic Nucleus Morphology (Abnormal Brain Morphology)
Abnormal Superior Colliculus Morphology (Abnormal Brain Morphology)
Abnormal Supraoptic Nucleus Morphology (Abnormal Brain Morphology)
Abnormal Tectum Morphology (Abnormal Brain Morphology)
Abnormal Tegmentum Morphology (Abnormal Brain Morphology)
Abnormal Telencephalon Development (Abnormal Brain Morphology)
Abnormal Telencephalon Morphology (Abnormal Brain Morphology)
Abnormal Temporal Lobe Morphology (Abnormal Brain Morphology)
Abnormal Thalamus Morphology (Abnormal Brain Morphology)
Abnormal Third Ventricle Morphology (Abnormal Brain Morphology)
Abnormal Ventral Striatum Morphology (Abnormal Brain Morphology)
Abnormal Visual Cortex Morphology (Abnormal Brain Morphology)
Absent Anterior Commissure (Abnormal Brain Morphology)
Absent Cajal-Retzius Cell (Abnormal Brain Morphology)
Absent Cerebellum (Abnormal Brain Morphology)
Absent Cerebellum Vermis Lobule Ix (Abnormal Brain Morphology)
Absent Cerebellum Vermis Lobule Viii (Abnormal Brain Morphology)
Absent Corpus Callosum (Abnormal Brain Morphology)
Absent Hippocampal Commissure (Abnormal Brain Morphology)
Absent Lactotrophs (Abnormal Brain Morphology)
Absent Olfactory Bulb (Abnormal Brain Morphology)
Absent Somatotrophs (Abnormal Brain Morphology)
Absent Subplate (Abnormal Brain Morphology)
Adenohypophysis Hypoplasia (Abnormal Brain Morphology)
Brain Vacuoles (Abnormal Brain Morphology)
Cerebellum Hypoplasia (Abnormal Brain Morphology)
Cerebellum Vermis Hypoplasia (Abnormal Brain Morphology)
Cerebral Aqueductal Stenosis (Abnormal Brain Morphology)
Decreased Anterior Commissure Size (Abnormal Brain Morphology)
Decreased Brain Size (Abnormal Brain Morphology)
Decreased Brain Weight (Abnormal Brain Morphology)
Decreased Cajal-Retzius Cell Number (Abnormal Brain Morphology)
Decreased Corpus Callosum Size (Abnormal Brain Morphology)
Decreased Corticotroph Cell Number (Abnormal Brain Morphology)
Decreased Gonadotroph Cell Number (Abnormal Brain Morphology)
Decreased Hippocampal Commissure Size (Abnormal Brain Morphology)
Decreased Lactotroph Cell Number (Abnormal Brain Morphology)
Decreased Lactotroph Cell Size (Abnormal Brain Morphology)
Decreased Oligodendrocyte Progenitor Number (Abnormal Brain Morphology)
Decreased Purkinje Cell Number (Abnormal Brain Morphology)
Decreased Somatotroph Cell Number (Abnormal Brain Morphology)
Decreased Somatotroph Cell Size (Abnormal Brain Morphology)
Decreased Somatotroph Secretory Granule Number (Abnormal Brain Morphology)

Decreased Superior Colliculus Size (Abnormal Brain Morphology)
Decreased Thyrotroph Cell Number (Abnormal Brain Morphology)
Delaminated Cerebellar Granule Layer (Abnormal Brain Morphology)
Delaminated Cerebral Cortex (Abnormal Brain Morphology)
Delaminated Purkinje Cell Layer (Abnormal Brain Morphology)
Delayed Brain Development (Abnormal Brain Morphology)
Dilated Fourth Ventricle (Abnormal Brain Morphology)
Dilated Lateral Ventricles (Abnormal Brain Morphology)
Dilated Third Ventricle (Abnormal Brain Morphology)
Disorganized Cortical Plate (Abnormal Brain Morphology)
Ectopic Bergmann Glia Cells (Abnormal Brain Morphology)
Ectopic Cerebellar Granule Cells (Abnormal Brain Morphology)
Ectopic Purkinje Cell (Abnormal Brain Morphology)
Enlarged Fourth Ventricle (Abnormal Brain Morphology)
Enlarged Hippocampus (Abnormal Brain Morphology)
Enlarged Lateral Ventricles (Abnormal Brain Morphology)
Enlarged Pituitary Gland (Abnormal Brain Morphology)
Enlarged Third Ventricle (Abnormal Brain Morphology)
Exencephaly (Abnormal Brain Morphology)
Hippocampal Neuron Degeneration (Abnormal Brain Morphology)
Holoprosencephaly (Abnormal Brain Morphology)
Hydroencephaly (Abnormal Brain Morphology)
Increased Brain Size (Abnormal Brain Morphology)
Increased Brain Weight (Abnormal Brain Morphology)
Increased Lactotroph Cell Number (Abnormal Brain Morphology)
Increased Thyrotroph Cell Number (Abnormal Brain Morphology)
Loss Of Basal Ganglia Neurons (Abnormal Brain Morphology)
Loss Of Cortex Neurons (Abnormal Brain Morphology)
Loss Of Hippocampal Neurons (Abnormal Brain Morphology)
Neurofibrillary Tangles (Abnormal Brain Morphology)
Non-Obstructive Hydrocephaly (Abnormal Brain Morphology)
Obstructive Hydrocephaly (Abnormal Brain Morphology)
Pituitary Gland Hyperplasia (Abnormal Brain Morphology)
Pituitary Gland Hypoplasia (Abnormal Brain Morphology)
Pituitary Intermediate Lobe Hyperplasia (Abnormal Brain Morphology)
Pituitary Intermediate Lobe Hypoplasia (Abnormal Brain Morphology)
Purkinje Cell Degeneration (Abnormal Brain Morphology)
Small Adenohypophysis (Abnormal Brain Morphology)
Small Cerebellum (Abnormal Brain Morphology)
Small Embryonic Telencephalon (Abnormal Brain Morphology)
Small Hippocampus (Abnormal Brain Morphology)
Small Olfactory Bulb (Abnormal Brain Morphology)
Small Pituitary Gland (Abnormal Brain Morphology)
Small Pituitary Intermediate Lobe (Abnormal Brain Morphology)
Small Tectum (Abnormal Brain Morphology)
Tau Protein Deposits (Abnormal Brain Morphology)

Thin Cerebellar Granule Layer (Abnormal Brain Morphology)
Thin Cerebellar Molecular Layer (Abnormal Brain Morphology)
Thin Cerebral Cortex (Abnormal Brain Morphology)
Thin Cortical Plate (Abnormal Brain Morphology)
Thin External Granule Cell Layer (Abnormal Brain Morphology)
Abnormal Channel Response (Abnormal Synaptic Transmission)
Abnormal Cns Synaptic Transmission (Abnormal Synaptic Transmission)
Abnormal Endplate Potential (Abnormal Synaptic Transmission)
Abnormal Excitatory Postsynaptic Currents (Abnormal Synaptic Transmission)
Abnormal Excitatory Postsynaptic Potential (Abnormal Synaptic Transmission)
Abnormal Glutamate-Mediated Receptor Currents (Abnormal Synaptic Transmission)
Abnormal Inhibitory Postsynaptic Currents (Abnormal Synaptic Transmission)
Abnormal Long Term Depression (Abnormal Synaptic Transmission)
Abnormal Long Term Potentiation (Abnormal Synaptic Transmission)
Abnormal Miniature Endplate Potential (Abnormal Synaptic Transmission)
Abnormal Miniature Excitatory Postsynaptic Currents (Abnormal Synaptic Transmission)
Abnormal Miniature Inhibitory Postsynaptic Currents (Abnormal Synaptic Transmission)
Abnormal Neurotransmitter Level (Abnormal Synaptic Transmission)
Abnormal Neurotransmitter Secretion (Abnormal Synaptic Transmission)
Abnormal Neurotransmitter Uptake (Abnormal Synaptic Transmission)
Abnormal Paired-Pulse Facilitation (Abnormal Synaptic Transmission)
Abnormal Paired-Pulse Inhibition (Abnormal Synaptic Transmission)
Abnormal Pns Synaptic Transmission (Abnormal Synaptic Transmission)
Abnormal Prepulse Inhibition (Abnormal Synaptic Transmission)
Abnormal Synaptic Acetylcholine Release (Abnormal Synaptic Transmission)
Abnormal Synaptic Dopamine Release (Abnormal Synaptic Transmission)
Abnormal Synaptic Glutamate Release (Abnormal Synaptic Transmission)
Abnormal Synaptic Norepinephrine Release (Abnormal Synaptic Transmission)
Absent Long Term Depression (Abnormal Synaptic Transmission)
Decreased Excitatory Postsynaptic Current Amplitude (Abnormal Synaptic Transmission)
Decreased Post-Tetanic Potentiation (Abnormal Synaptic Transmission)
Decreased Prepulse Inhibition (Abnormal Synaptic Transmission)
Decreased Synaptic Depression (Abnormal Synaptic Transmission)
Decreased Synaptic Glutamate Release (Abnormal Synaptic Transmission)
Enhanced Long Term Potentiation (Abnormal Synaptic Transmission)
Enhanced Paired-Pulse Facilitation (Abnormal Synaptic Transmission)
Increased Excitatory Postsynaptic Current Amplitude (Abnormal Synaptic Transmission)
Increased Post-Tetanic Potentiation (Abnormal Synaptic Transmission)
Increased Prepulse Inhibition (Abnormal Synaptic Transmission)
Prolonged Excitatory Postsynaptic Current Decay Time (Abnormal Synaptic Transmission)
Reduced Ampa-Mediated Synaptic Currents (Abnormal Synaptic Transmission)
Reduced Long Term Depression (Abnormal Synaptic Transmission)
Reduced Long Term Potentiation (Abnormal Synaptic Transmission)
Reduced Nmda-Mediated Synaptic Currents (Abnormal Synaptic Transmission)
Short Excitatory Postsynaptic Current Decay Time (Abnormal Synaptic Transmission)
Abnormal Myelination (Brain Morphology or Physiology)

Abnormal Nervous System Development (Brain Morphology or Physiology)
Abnormal Nervous System Electrophysiology (Brain Morphology or Physiology)
Abnormal Accessory Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cochlear Ganglion Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cochlear Hair Bundle Tip Links Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cochlear Hair Cell Inter-Stereocilial Links Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cochlear Hair Cell Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cochlear Hair Cell Stereociliary Bundle Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cochlear Inner Hair Cell Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cochlear Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cochlear Outer Hair Cell Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cranial Ganglia Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Cranial Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Dorsal Root Ganglion Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Facial Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Geniculate Ganglion Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Glossopharyngeal Ganglion Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Glossopharyngeal Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Hair Cell Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Hypoglossal Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Inner Hair Cell Kinocilium Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Inner Hair Cell Stereociliary Bundle Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Inner Hair Cell Synaptic Ribbon Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Kinocilium Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Lumbar Dorsal Root Ganglion Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Mandibular Nerve Branching (Abnormal Somatic Nervous System Morphology)
Abnormal Oculomotor Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Olfactory Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Optic Disc Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Optic Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Orientation Of Cochlear Hair Cell Stereociliary Bundles (Abnormal Somatic Nervous System Morphology)
Abnormal Orientation Of Inner Hair Cell Stereociliary Bundles (Abnormal Somatic Nervous System Morphology)
Abnormal Orientation Of Outer Hair Cell Stereociliary Bundles (Abnormal Somatic Nervous System Morphology)
Abnormal Outer Hair Cell Kinocilium Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Outer Hair Cell Stereociliary Bundle Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Phrenic Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Sciatic Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Spinal Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Trigeminal Ganglion Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Trigeminal Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Trochlear Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Vagus Ganglion Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Vagus Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Vestibular Ganglion Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Vestibular Hair Cell Stereociliary Bundle Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Vestibular Nerve Morphology (Abnormal Somatic Nervous System Morphology)

Abnormal Vestibulocochlear Nerve Morphology (Abnormal Somatic Nervous System Morphology)
Abnormal Vomeronasal Organ Morphology (Abnormal Somatic Nervous System Morphology)
Absent Cochlear Ganglion (Abnormal Somatic Nervous System Morphology)
Absent Cochlear Hair Bundle Ankle Links (Abnormal Somatic Nervous System Morphology)
Absent Cochlear Nerve (Abnormal Somatic Nervous System Morphology)
Absent Glossopharyngeal Nerve (Abnormal Somatic Nervous System Morphology)
Absent Muscle Spindles (Abnormal Somatic Nervous System Morphology)
Absent Nodose Ganglion (Abnormal Somatic Nervous System Morphology)
Absent Optic Chiasm (Abnormal Somatic Nervous System Morphology)
Absent Optic Nerve (Abnormal Somatic Nervous System Morphology)
Absent Outer Hair Cell Stereocilia (Abnormal Somatic Nervous System Morphology)
Absent Petrosal Ganglion (Abnormal Somatic Nervous System Morphology)
Absent Vestibular Ganglion (Abnormal Somatic Nervous System Morphology)
Absent Vestibular Hair Cell Stereocilia (Abnormal Somatic Nervous System Morphology)
Cochlear Ganglion Degeneration (Abnormal Somatic Nervous System Morphology)
Decreased Inner Hair Cell Stereocilia Number (Abnormal Somatic Nervous System Morphology)
Decreased Outer Hair Cell Stereocilia Number (Abnormal Somatic Nervous System Morphology)
Decreased Vestibular Hair Cell Stereocilia Number (Abnormal Somatic Nervous System Morphology)
Disorganized Dorsal Root Ganglion (Abnormal Somatic Nervous System Morphology)
Fused Dorsal Root Ganglion (Abnormal Somatic Nervous System Morphology)
Fused Inner Hair Cell Stereocilia (Abnormal Somatic Nervous System Morphology)
Fused Outer Hair Cell Stereocilia (Abnormal Somatic Nervous System Morphology)
Fusion Of Glossopharyngeal And Vagus Nerve (Abnormal Somatic Nervous System Morphology)
Glossopharyngeal Nerve Hypoplasia (Abnormal Somatic Nervous System Morphology)
Optic Nerve Atrophy (Abnormal Somatic Nervous System Morphology)
Optic Nerve Coloboma (Abnormal Somatic Nervous System Morphology)
Optic Nerve Cupping (Abnormal Somatic Nervous System Morphology)
Optic Nerve Degeneration (Abnormal Somatic Nervous System Morphology)
Optic Nerve Hypoplasia (Abnormal Somatic Nervous System Morphology)
Short Cochlear Hair Cell Stereocilia (Abnormal Somatic Nervous System Morphology)
Short Cochlear Outer Hair Cells (Abnormal Somatic Nervous System Morphology)
Short Inner Hair Cell Stereocilia (Abnormal Somatic Nervous System Morphology)
Short Outer Hair Cell Stereocilia (Abnormal Somatic Nervous System Morphology)
Small Dorsal Root Ganglion (Abnormal Somatic Nervous System Morphology)
Small Geniculate Ganglion (Abnormal Somatic Nervous System Morphology)
Small L4 Dorsal Root Ganglion (Abnormal Somatic Nervous System Morphology)
Small Nodose Ganglion (Abnormal Somatic Nervous System Morphology)
Small Petrosal Ganglion (Abnormal Somatic Nervous System Morphology)
Small Trigeminal Ganglion (Abnormal Somatic Nervous System Morphology)
Small Vomeronasal Organ (Abnormal Somatic Nervous System Morphology)
Vestibular Ganglion Degeneration (Abnormal Somatic Nervous System Morphology)
Vestibular Ganglion Hypoplasia (Abnormal Somatic Nervous System Morphology)
Abnormal Somatic Nervous System Physiology (Brain Morphology or Physiology)
Abnormal Behavioral Response To Addictive Substance (Abnormal Behavioral Response To Xenobiotic)
Abnormal Behavioral Response To Amphetamine (Abnormal Behavioral Response To Xenobiotic)
Abnormal Behavioral Response To Anesthetic (Abnormal Behavioral Response To Xenobiotic)

Abnormal Behavioral Response To Nicotine (Abnormal Behavioral Response To Xenobiotic)
 Abnormal Sensitization To Xenobiotic (Abnormal Behavioral Response To Xenobiotic)
 Alcohol Preference (Abnormal Behavioral Response To Xenobiotic)
 Enhanced Behavioral Response To Addictive Substance (Abnormal Behavioral Response To Xenobiotic)
 Enhanced Behavioral Response To Anesthetic (Abnormal Behavioral Response To Xenobiotic)
 Enhanced Behavioral Response To Cocaine (Abnormal Behavioral Response To Xenobiotic)
 Enhanced Behavioral Response To Xenobiotic (Abnormal Behavioral Response To Xenobiotic)
 Impaired Behavioral Response To Addictive Substance (Abnormal Behavioral Response To Xenobiotic)
 Impaired Behavioral Response To Alcohol (Abnormal Behavioral Response To Xenobiotic)
 Impaired Behavioral Response To Cocaine (Abnormal Behavioral Response To Xenobiotic)
 Impaired Behavioral Response To Morphine (Abnormal Behavioral Response To Xenobiotic)
 Impaired Behavioral Response To Xenobiotic (Abnormal Behavioral Response To Xenobiotic)
 Increased Alcohol Consumption (Abnormal Behavioral Response To Xenobiotic)
 Increased Susceptibility To Pharmacologically Induced Seizures (Abnormal Behavioral Response To Xe
 Abnormal Impulse Behavior Control (Other Behavioral Abnormalities)
 Abnormal Mechanical Nociception (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Abnormal Nociception After Inflammation (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Abnormal Pain Threshold (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Abnormal Thermal Nociception (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Abnormal Thermosensation (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Abnormal Touch/ Nociception (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Allodynia (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Decreased Thermal Nociceptive Threshold (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Hyperalgesia (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Hyperresponsive (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Hypoalgesia (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Increased Chemical Nociceptive Threshold (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Increased Thermal Nociceptive Threshold (Abnormal Sensory Capabilities/Reflexes/Nociception)
 Abnormal Frequency Of Paradoxical Sleep (Abnormal Sleep Behavior)
 Abnormal Non-Rapid Eye Movement Sleep Pattern (Abnormal Sleep Behavior)
 Abnormal Paradoxical Sleep Pattern (Abnormal Sleep Behavior)
 Abnormal Sleep Pattern (Abnormal Sleep Behavior)
 Fragmentation Of Sleep/Wake States (Abnormal Sleep Behavior)
 Narcolepsy (Abnormal Sleep Behavior)
 Catalepsy (Other Behavioral Abnormalities)
 Decreased Aerobic Running Capacity (Fatigue)
 Impaired Exercise Endurance (Fatigue)
 Spinal Hemorrhage (Other Behavioral Abnormalities)
 Abnormal Cardiac Ganglion Morphology (Abnormal Autonomic Nervous System Morphology)
 Abnormal Enteric Cholinergic Neuron Morphology (Abnormal Autonomic Nervous System Morphology)
 Abnormal Enteric Ganglia Morphology (Abnormal Autonomic Nervous System Morphology)
 Abnormal Enteric Nervous System Morphology (Abnormal Autonomic Nervous System Morphology)
 Abnormal Enteric Neuron Morphology (Abnormal Autonomic Nervous System Morphology)
 Abnormal Myenteric Nerve Plexus Morphology (Abnormal Autonomic Nervous System Morphology)
 Abnormal Parasympathetic Postganglionic Fiber Morphology (Abnormal Autonomic Nervous System Morphology)
 Abnormal Paravertebral Ganglion Morphology (Abnormal Autonomic Nervous System Morphology)

Abnormal Stellate Ganglion Morphology (Abnormal Autonomic Nervous System Morphology)
Abnormal Submucous Nerve Plexus Morphology (Abnormal Autonomic Nervous System Morphology)
Abnormal Sympathetic Ganglion Morphology (Abnormal Autonomic Nervous System Morphology)
Abnormal Sympathetic System Morphology (Abnormal Autonomic Nervous System Morphology)
Absent Enteric Neurons (Abnormal Autonomic Nervous System Morphology)
Absent Superior Cervical Ganglion (Abnormal Autonomic Nervous System Morphology)
Paravertebral Ganglia Hyperplasia (Abnormal Autonomic Nervous System Morphology)
Prevertebral Ganglia Hyperplasia (Abnormal Autonomic Nervous System Morphology)
Small Superior Cervical Ganglion (Abnormal Autonomic Nervous System Morphology)
Abnormal Baroreceptor Physiology (Abnormal Autonomic Nervous System Physiology)
Abnormal Pre-Botzinger Complex Physiology (Abnormal Autonomic Nervous System Physiology)
Abnormal Sympathetic Nervous System Physiology (Abnormal Autonomic Nervous System Physiology)
Abnormal Innervation (Other Brain Morpholog or Physiology Phenotypes)
Abnormal Meninges Morphology (Other Brain Morpholog or Physiology Phenotypes)
Abnormal Nervous System Tract Morphology (Other Brain Morpholog or Physiology Phenotypes)
Abnormal Neuron Morphology (Other Brain Morpholog or Physiology Phenotypes)
Abnormal Neuron Physiology (Other Brain Morpholog or Physiology Phenotypes)
Abnormal Neuronal Stem Cell Physiology (Other Brain Morpholog or Physiology Phenotypes)
Abnormal Sensorimotor Gating (Other Brain Morpholog or Physiology Phenotypes)
Abnormal Spinal Cord Central Canal Morphology (Abnormal Spinal Cord Morphology)
Abnormal Spinal Cord Dorsal Column Morphology (Abnormal Spinal Cord Morphology)
Abnormal Spinal Cord Dorsal Horn Morphology (Abnormal Spinal Cord Morphology)
Abnormal Spinal Cord Grey Matter Morphology (Abnormal Spinal Cord Morphology)
Abnormal Spinal Cord Interneuron Morphology (Abnormal Spinal Cord Morphology)
Abnormal Spinal Cord Ventral Horn Morphology (Abnormal Spinal Cord Morphology)
Abnormal Spinal Cord White Matter Morphology (Abnormal Spinal Cord Morphology)
Decreased Spinal Cord Size (Abnormal Spinal Cord Morphology)
Increased Spinal Cord Size (Abnormal Spinal Cord Morphology)
Spinal Cord Degeneration (Abnormal Spinal Cord Morphology)
Impaired Synaptic Plasticity (Abnormal Synaptic Plasticity)
Decreased Cerebral Infarction Size (Altered Response To Cns Ischemic Injury)
Decreased Susceptibility To Ischemic Brain Injury (Altered Response To Cns Ischemic Injury)
Increased Cerebral Infarction Size (Altered Response To Cns Ischemic Injury)
Increased Susceptibility To Ischemic Brain Injury (Altered Response To Cns Ischemic Injury)
Brain Inflammation (Cns Inflammation)
Encephalomeningocele (Other Brain Morpholog or Physiology Phenotypes)
Increased Forebrain Apoptosis (Increased Brain Apoptosis)
Increased Hindbrain Apoptosis (Increased Brain Apoptosis)
Increased Brain Tumor Incidence (Increased Nervous System Tumor Incidence)
Increased Ganglioneuroma Incidence (Increased Nervous System Tumor Incidence)
Increased Glioma Incidence (Increased Nervous System Tumor Incidence)
Increased Medulloblastoma Incidence (Increased Nervous System Tumor Incidence)
Increased Pituitary Adenohypophysis Tumor Incidence (Increased Nervous System Tumor Incidence)
Increased Pituitary Adenoma Incidence (Increased Nervous System Tumor Incidence)
Increased Pituitary Gland Tumor Incidence (Increased Nervous System Tumor Incidence)
Increased Prolactinoma Incidence (Increased Nervous System Tumor Incidence)

Increased Schwannoma Incidence (Increased Nervous System Tumor Incidence)
Increased Embryonic Neuroepithelium Apoptosis (Increased Neural Tube Apoptosis)
Increased Spinal Cord Apoptosis (Other Brain Morpholog or Physiology Phenotypes)
Intracerebral Hemorrhage (Intracranial Hemorrhage)
Intraventricular Hemorrhage (Intracranial Hemorrhage)
Alpha-Synuclein Inclusion Body (Nervous System Inclusion Bodies)
Amyloid Beta Deposits (Nervous System Inclusion Bodies)
Lafora Bodies (Nervous System Inclusion Bodies)
Axon Degeneration (Neurodegeneration (Mouse))
Axonal Dystrophy (Neurodegeneration (Mouse))
Axonal Spheroids (Neurodegeneration (Mouse))
Peripheral Nervous System Degeneration (Neurodegeneration (Mouse))
Spongiform Encephalopathy (Neurodegeneration (Mouse))
Other Brain Morpholog or Physiology Phenotypes (Other Brain Morpholog or Physiology Phenotypes)

Portal 5. Gene Function Portal Classification.

Semaphorins and Related (Axonal Growth, Guidance and Fasciculation)
Plexins and Related (Axonal Growth, Guidance and Fasciculation)
Neuropilins and Related (Axonal Growth, Guidance and Fasciculation)
Ephrin and Related (Axonal Growth, Guidance and Fasciculation)
Other Axonal Growth and Guidance Genes (Axonal Growth, Guidance and Fasciculation)
Cell Adhesion (Cell:Cell and Cell:Substrate Interactions)
Extracellular Matrix Proteins (Cell:Cell and Cell:Substrate Interactions)
Cell Proliferation (Cell Proliferation and Programmed Cell Death)
Apoptosis (Cell Proliferation and Programmed Cell Death)
Bone Growth and Development (Development and Plasticity)
Neuronal Migration (Development and Plasticity)
Neurite Outgrowth, Extension, and Plasticity (Development and Plasticity)
Growth Factors and Receptors (Endocrine Function)
Protein Hormones and Receptors (Endocrine Function)
Steroid Related (Endocrine Function)
Histone Modification (Chromatin Structure and Remodeling)
Transcription Factors: DNA-Binding (Transcription Regulation)
Transcription Factors: non-DNA-Binding (Transcription Regulation)
RNA-Binding Protein (Gene Expression Regulation)
Inflammation (Immune Function)
Calcium Binding Proteins (Intracellular Signaling)
G-protein and Related (Intracellular Signaling)
Phosphatases and Related (Intracellular Signaling)
Wnt Related (Intracellular Signaling)
Phosphatidylinositol Related (Intracellular Signaling)
cAMP and Related (Intracellular Signaling)
Other Intracellular Signaling Molecules (Intracellular Signaling)
Intracellular Protein Trafficking (Intracellular Trafficking)
Exo/Endocytosis: Vesicle Trafficking (Intracellular Trafficking)
Endoplasmic Reticulum (Intracellular Trafficking)
Glycosylation (Not ECM) (Intracellular Trafficking)
Carbohydrates (Metabolic Pathways)
Cholesterol Related (Lipids)
Lipids (Non-Cholesterol Related) (Lipids)
Steroid Biosynthesis (Lipids)
Hydrolytic Enzymes (Metabolic Pathways)
Nucleotides (Metabolic Pathways)
Ubiquitin Related (Proteinases and Peptidases)
Other Proteinases and Peptidases (Proteinases and Peptidases)
Polyamines (Metabolic Pathways)
Glutathione Related (Oxidative Metabolism)
Mitochondrial Oxidative Metabolism (Oxidative Metabolism)
Other Oxidative Metabolism (Oxidative Metabolism)
Lysosome Related (Metabolic Pathways)

Amino Acid Related (Metabolic Pathways)

Myelin (Gene Function)

Calcium Channels (Neuronal Cell Excitability)

Chloride Channels (Neuronal Cell Excitability)

Cyclic Nucleotide-gated Channels (Neuronal Cell Excitability)

HCN (potassium/sodium hyperpolarization-activated cyclic nucleotide-gated channel) (Potassium Channels)
K-CHANNEL TETRAMERIZATION (btb/poz domain proteins) (Potassium Channels)

KCNA Subunits - 6TM/1P (potassium voltage-gated channel subfamily a, shaker-related) (Potassium Channels)

KCNB Subunits - 6TM/1P (voltage-gated channel subfamily b, shab-related) (Potassium Channels)

KCNC Functional Subunits - 6TM/1P (voltage-gated subfamily c, shaw-related) (Potassium Channels)

KCND Functional and Modulatory Subunits (Shab-related) (Potassium Channels)

KCNE (ISK) Accessory Subunits (Mink, MiRP) - 1TM (voltage-gated subfamily e) (Potassium Channels)

KCNF Modulatory Subunits - 6TM/1P (voltage-gated channel subfamily f) (Potassium Channels)

KCNJ Modulatory Subunits - 6TM/1P (voltage-gated channel subfamily g) (Potassium Channels)

KCNH Subunits - 6TM/1P (voltage-gated subfamily h; ether-a-gogo, ether-a-gogo-like or ether-a-gogo)

KCNJ Subunits (inward rectifying IRKs, GIRKs, and related) (Potassium Channels)

KCNM subunit (a.k.a. Maxi-K, Slo, BK) (calcium-activated potassium subfamily m) (Potassium Channels)

KCNN Subunits (a.k.a. SK) (small conductance calcium-activated channel) (Potassium Channels)

KCNS Modulatory Subunits - 6TM/1P (voltage-gated subfamily s, delayed-rectifier) (Potassium Channels)

KCNT Subunits (a.k.a. SLACK and SLICK) (subfamily t) (Potassium Channels)

KCNV Modulatory Subunits - 6TM/1P (voltage-gated subfamily v) (Potassium Channels)

TWIK (inward rectifying), TASK (acid-sensitive), TREK (outward rectifying), THIK (halothane-inhibited) (Potassium Channels)
Sodium Channels (Neuronal Cell Excitability)

Membrane Related (Structural Proteins)

Chaperones and Related (Structural Proteins)

Ciliary/Centrosome Related (Structural Proteins)

Cytoskeleton Related (Structural Proteins)

Ribosome Related (Structural Proteins)

Kinetochores/Synaptonemal Related (Structural Proteins)

Motor Proteins and Related (Structural Proteins)

Tight Junctions Related (Structural Proteins)

Structural (Other) (Structural Proteins)

Neuropeptides and Related (Synaptic Structure and Function)

Glutamatergic (Neurotransmitter Receptors)

GABAergic (Neurotransmitter Receptors)

Glycinergic (Neurotransmitter Receptors)

Adrenergic (Neurotransmitter Receptors)

Dopaminergic (Neurotransmitter Receptors)

Serotonergic (Neurotransmitter Receptors)

Histaminergic (Neurotransmitter Receptors)

Cholinergic (Neurotransmitter Receptors)

Purinergic (Neurotransmitter Receptors)

Opioid (Neurotransmitter Receptors)

Neurotransmitter Synthesis (Synaptic Structure and Function)

Neurotransmitter Degradation (Synaptic Structure and Function)

Neurotransmitter Transport (Synaptic Structure and Function)

Pre-Synaptic Structure (Synaptic Structure)

Post-Synaptic Structure (Synaptic Structure)

Regulation of Synaptic Function (Synaptic Structure and Function)

Neurotransmitter Transporters (SLC Transporters)

Other SLC Transporters (SLC Transporters)

Non-SLC Transporters (Transporters)

Portal 6. Songbird Discoveries Portal Classification.

Portal 6A. Highlighted ZEBRA-Based Discoveries

Lovell et al., 2015 (Genes Leading to Comparative Insights)
 Gonzalez-Cabrera C et al., 2015 (Genes Leading to Comparative Insights)
 Gonzalez-Cabrera C et al., 2015 (Genes Leading to Comparative Insights)
 Jarvis et al., 2013 (Genes Leading to Comparative Insights)
 Budzillo et al., 2017 (Genes Leading to Physiological Insights)
 RA-Laryngeal Cortex Genes (Pfenning et al, 2014)
 Area X-Striatum Genes (Pfenning et al, 2014)

Portal 6B. Songbird Studies

Cheng and Clayton, 2004 (Auditorily Induced Genes)
 Dong et al., 2009 (Auditorily Induced Genes)
 Mello and Clayton, 1994 (Auditorily Induced Genes)
 Velho and Mello, 2008 (Auditorily Induced Genes)
 Area X vs. VSP (Lovell et al., 2018)
 HVC vs. Shelf (Lovell et al., 2018)
 Lombardino et al., 2006 (Constitutive Transcriptome of the Song System)
 Lovell et al., 2008. Table S1 (Constitutive Transcriptome of the Song System)
 Lovell et al., Unpublished (Constitutive transcriptomics, NCM/L2a)
 nXIIts vs. SSP (Lovell et al., 2018)
 RA vs. VLA (Lovell et al., 2018)
 Table 2 (Kato and Okanoya, 2010)
 Table 1 (Kato and Okanoya, 2010)
 London et al., 2009. Supplementary Table 1 (Developmental Changes)
 Olson CR et al., 2015 (Developmental Changes)
 Wade et al., 2005 (Developmental Changes)
 Vicario et al., 2017 (Extended Amygdala Studies)
 Haesler et al., 2004 (FOXP2 Studies)
 Mendoza et al., 2015 (FOXP2 Studies)
 Teramitsu et al., 2006 (FOXP2 Studies)
 Vicario et al., 2017 (FOXP2 Studies)
 Kubikova et al., 2010 (Gene Family Studies)
 Potassium Channels and Related (HCN-KCNJ) (Lovell et al., 2013. Table 1)
 Potassium Channels and Related (KCNK-KCTD) (Wada et al., 2004. Figure 2)
 Wirthlin M et al., 2014 (Novel Genes in Songbirds)
 Denisenko-Nehrbass et al., 2000 (Retinoic Acid Related Genes)
 Roeske et al., 2014 (Retinoic Acid Related Genes)
 Mukai et al., 2009. Table S1 (Seasonal Regulation/Photoperiodicity Effects on Gene Expression)
 Area X. Table S2 (Stevenson TJ et al., 2012)
 HVC. Table S1 (Stevenson TJ et al., 2012)
 RA. Table S3 (Stevenson TJ et al., 2012)
 POA. Table S4 (Stevenson TJ et al., 2012)
 RA. Table S4 (Thompson C et al., 2012)

HVC. Table S3 (Thompson C et al., 2012)
Z Chromosome Genes (Sex Chromosomes Genes)
Itoh et al., 2007 (Sex Differences)
Naurin S et al., 2011 (Sex Differences)
Panaitof S et al., 2010 (Sex Differences)
Hilliard et al., 2012. Table S3, singing modules (Singing Induced Genes)
Wada et al., 2006. Figure 3 (Singing Induced Genes)
Whitney et al., 2014, Table S8 (Singing Induced Genes)
Frankl-Vilches C et al., 2015 (Steroid Hormone Sensitive Genes)