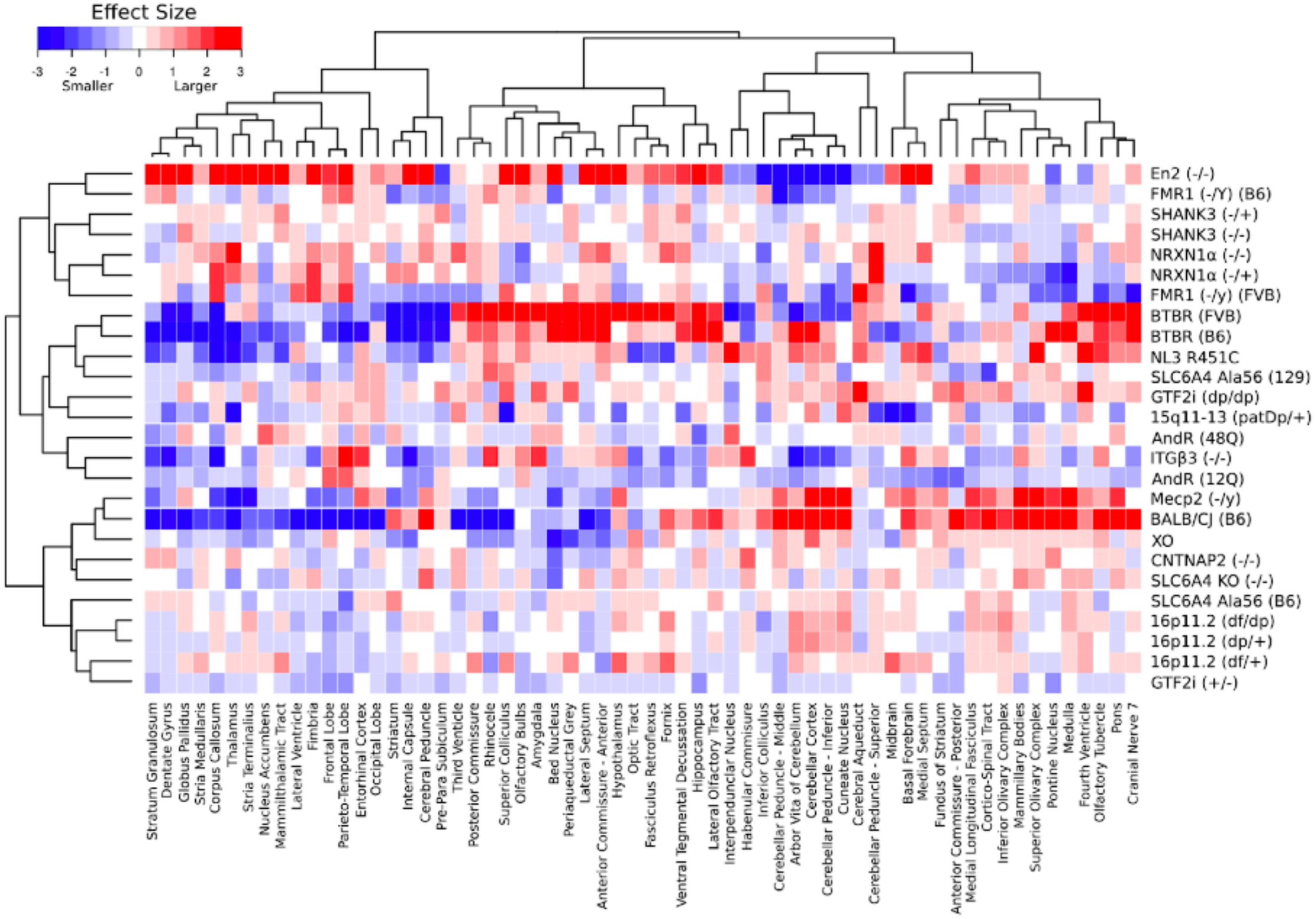
How to identify heterogenous brain regions?

Approach 1: Neuroanatomical Measurements

Problem:

- Ignores connections between brain regions


Effect Size
-3
-2
-1
0
1
2
3
Smaller
Larger
En2 (-/-)
FMR1 (-/Y) (B6)
SHANK3 (-/+)
SHANK3 (-/-)
NRXN1α (-/-)
NRXN1α (-/+)
FMR1 (-/y) (FVB)
BTBR (FVB)
BTBR (B6)
NL3 R451C
SLC6A4 Ala56 (129)
GTF2i (dp/dp)
15q11-13 (patDp/+)
AndR (48Q)
ITGβ3 (-/-)
AndR (12Q)
Mecp2 (-/y)
BALB/CJ (B6)
XO
CNTNAP2 (-/-)
SLC6A4 KO (-/-)
SLC6A4 Ala56 (B6)
16p11.2 (df/dp)
16p11.2 (dp/+)
16p11.2 (df/+)
GTF2i (+/-)
Stratum Granulosum
Dentate Gyrus
Globus Pallidus
Stria Medullaris
Corpus Callosum
Thalamus
Stria Terminalius
Nucleus Accumbens
Mammilthalamic Tract
Lateral Ventricle
Fimbria
Frontal Lobe
Parieto-Temporal Lobe
Entorhinal Cortex
Occipital Lobe
Striatum
Internal Capsule
Cerebral Peduncle
Pre-Para Subiculum
Third Venticle
Posterior Commissure
Rhinocele
Superior Colliculus
Olfactory Bulbs
Amygdala
Bed Nucleus
Periaqueductal Grey
Lateral Septum
Anterior Commissure - Anterior
Hypothalamus
Optic Tract
Fasciculus Retroflexus
Fornix
Ventral Tegmental Decussation
Hippocampus
Lateral Olfactory Tract
Interpenduncular Nucleus
Habenular Commisure
Inferior Colliculus
Cerebellar Peduncle - Middle
Arbor Vita of Cerebelium
Cerebellar Cortex
Cerebellar Peduncle - Inferior
Cuneate Nucleus
Cerebral Aqueduct
Cerebellar Peduncle - Superior
Midbrain
Basal Forebrain
Medial Septum
Fundus of Striatum
Anterior Commissure - Posterior
Medial Longitudinal Fasciculus
Cortico-Spinal Tract
Inferior Olivary Complex
Mammillary Bodies
Superior Olivary Complex
Pontine Nucleus
Medulla
Fourth Ventricle
Olfactory Tubercle
Pons
Cranial Nerve 7

Ellegood et al., (Mol Psych) 2014

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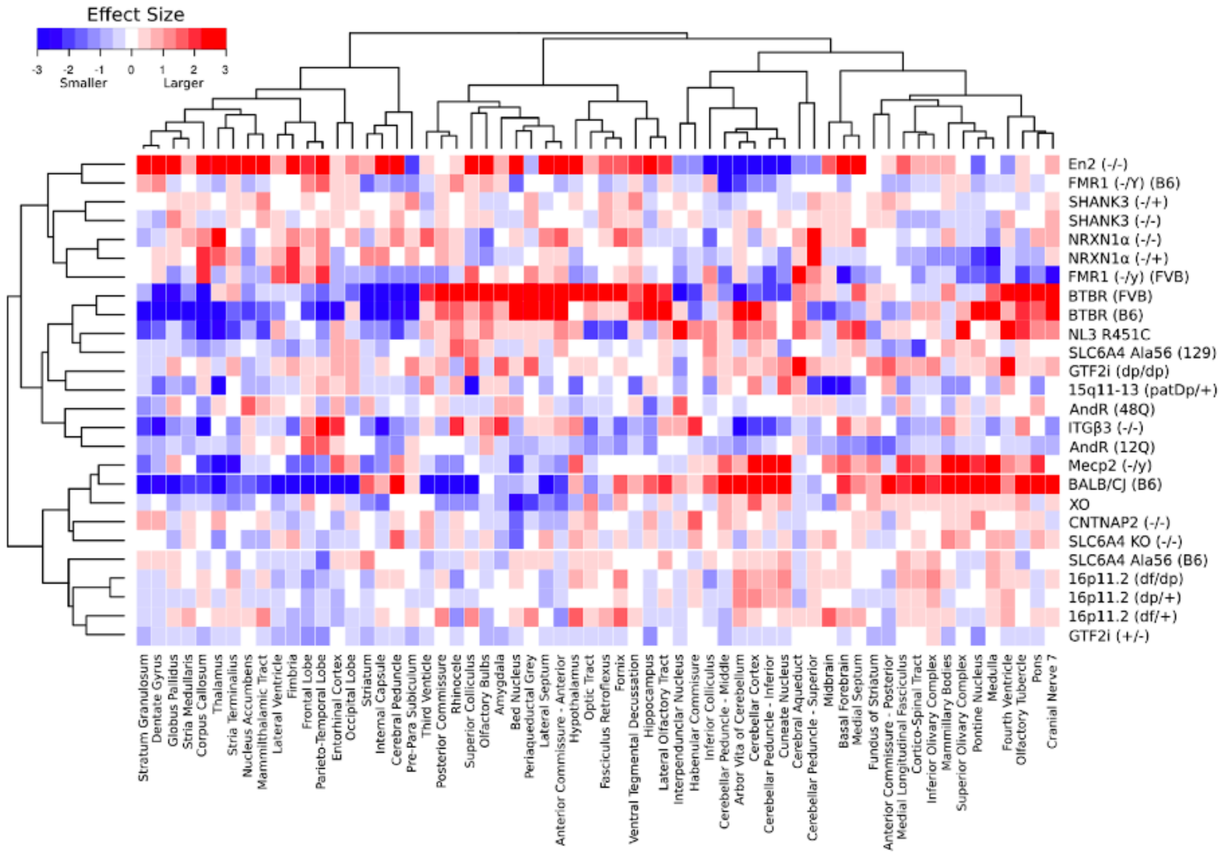

Ellegood et al., (Mol Psych) 2014

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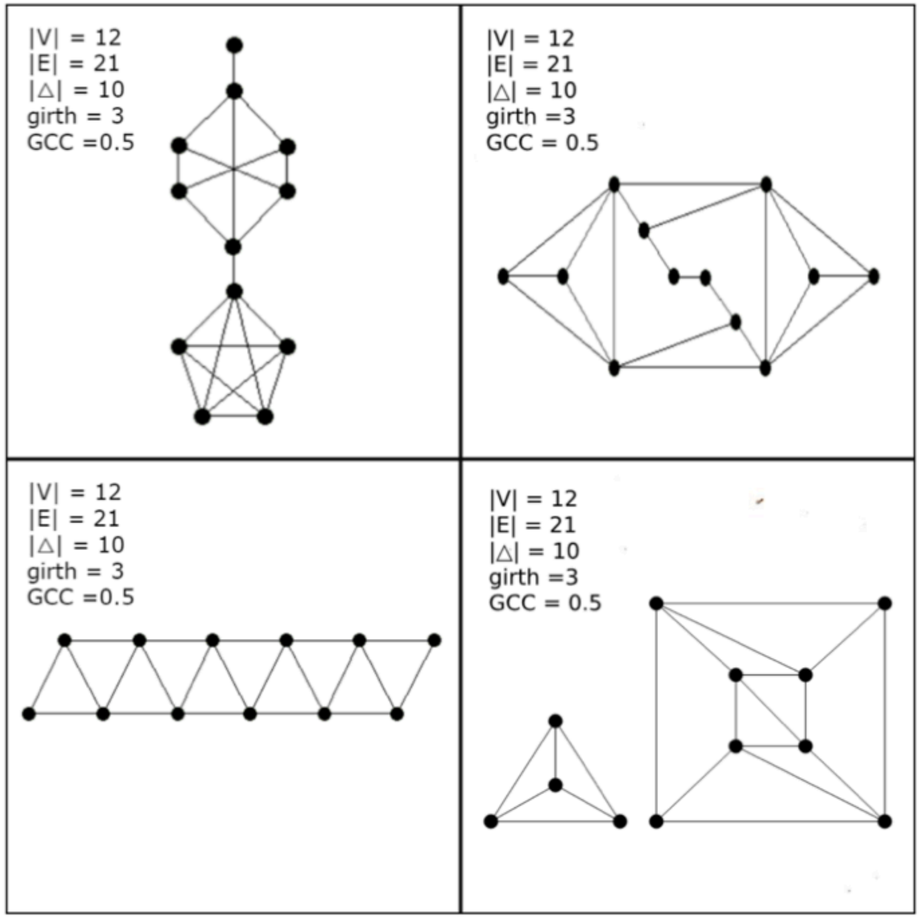
Approach 2: Network Summary Statistics



Chen et al., (arXiv) 2019