

main

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## 1 Summary of features for interaction analysis

```
[1]: import pandas as pd
```

### 1.1 Function

```
[2]: def get_summary(feature):  
    fn = "../../_m/%s/brainseq_ancestry_4tissues_mashr.tsv" % feature  
    df = pd.read_csv(fn, sep='\t')  
    cc = df[(df["N_Regions_Shared"] == 1) & (df["Caudate"] == 1)].shape[0]  
    gg = df[(df["N_Regions_Shared"] == 1) & (df["Dentate Gyrus"] == 1)].shape[0]  
    dd = df[(df["N_Regions_Shared"] == 1) & (df["DLPFC"] == 1)].shape[0]  
    hh = df[(df["N_Regions_Shared"] == 1) & (df["Hippocampus"] == 1)].shape[0]  
    sig = df[(df["N_Regions_Shared"] != 0)].copy()  
    print(feature.upper())  
    #print(df.groupby("N_Regions_Shared").size())  
    print("There are %d Caudate specific eFeatures!" % cc)  
    print("There are %d Dentate Gyrus specific eFeatures!" % gg)  
    print("There are %d DLPFC specific eFeatures!" % dd)  
    print("There are %d Hippocampus specific eFeatures!\n" % hh)  
    print("There are {} ({:.1%}) DE {} shared between two brain regions!".  
    ↪ format(df.groupby("N_Regions_Shared").size()[2],  
    ↪ df.groupby("N_Regions_Shared").size()[2]/sig.shape[0],  
    ↪ feature))  
    print("There are {} ({:.1%}) DE {} shared across three brain regions!".  
    ↪ format(df.groupby("N_Regions_Shared").size()[3],  
    ↪ df.groupby("N_Regions_Shared").size()[3]/sig.shape[0],  
    ↪ feature))  
    print("There are {} ({:.1%}) DE {} shared across four brain regions!\n".  
    ↪ format(df.groupby("N_Regions_Shared").size()[4],  
    ↪ df.groupby("N_Regions_Shared").size()[4]/sig.shape[0],
```

```
↩ feature))
```

## 1.2 Summary

```
[3]: for feature in ["genes", "transcripts", "exons", "junctions"]:  
      get_summary(feature)
```

### GENES

There are 930 Caudate specific eFeatures!  
There are 907 Dentate Gyrus specific eFeatures!  
There are 790 DLPFC specific eFeatures!  
There are 808 Hippocampus specific eFeatures!

There are 2387 (26.6%) DE genes shared between two brain regions!  
There are 1731 (19.3%) DE genes shared across three brain regions!  
There are 1434 (16.0%) DE genes shared across four brain regions!

### TRANSCRIPTS

There are 2162 Caudate specific eFeatures!  
There are 3549 Dentate Gyrus specific eFeatures!  
There are 2402 DLPFC specific eFeatures!  
There are 2732 Hippocampus specific eFeatures!

There are 6055 (27.3%) DE transcripts shared between two brain regions!  
There are 3702 (16.7%) DE transcripts shared across three brain regions!  
There are 1614 (7.3%) DE transcripts shared across four brain regions!

### EXONS

There are 10388 Caudate specific eFeatures!  
There are 11647 Dentate Gyrus specific eFeatures!  
There are 11385 DLPFC specific eFeatures!  
There are 10077 Hippocampus specific eFeatures!

There are 17001 (21.1%) DE exons shared between two brain regions!  
There are 11513 (14.3%) DE exons shared across three brain regions!  
There are 8647 (10.7%) DE exons shared across four brain regions!

### JUNCTIONS

There are 3214 Caudate specific eFeatures!  
There are 4107 Dentate Gyrus specific eFeatures!  
There are 3917 DLPFC specific eFeatures!  
There are 3187 Hippocampus specific eFeatures!

There are 5323 (20.5%) DE junctions shared between two brain regions!  
There are 3429 (13.2%) DE junctions shared across three brain regions!  
There are 2819 (10.8%) DE junctions shared across four brain regions!

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