# Actinobacteria EvoMining Results

Actinobacteria is an ancient phylum {Referencia de luis}

## Tables

Table 1: Correlation of Inheritance Factors for Parents and Child

| Factors | Correlation between Parents & Child |
|---|---|
| GenomeDB | 1245 |
| Families | 65 |

**Expansions BoxPlot by metabolic family**

```
label(path = "chapter4/expansion_plotActinos.pdf", caption = "Expansions Boxplot",label = "Actino_expans
```

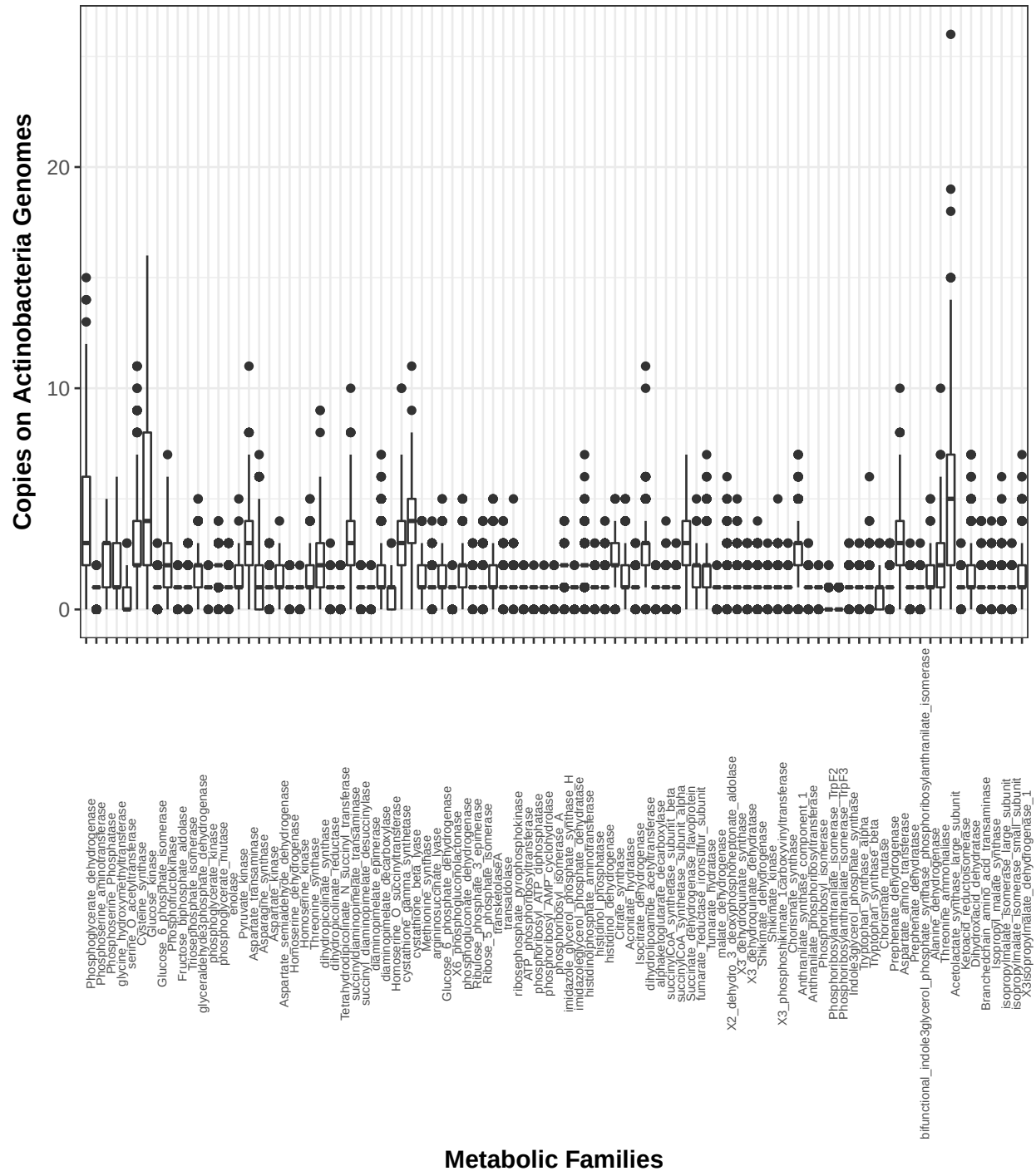


Figure 1: Expansions Boxplot

Here is a reference to the expansion boxplot: Figure 1.

## Central pathway expansions

Heat plot of central pathways expansions, Needs to be phylogenetically sorted.

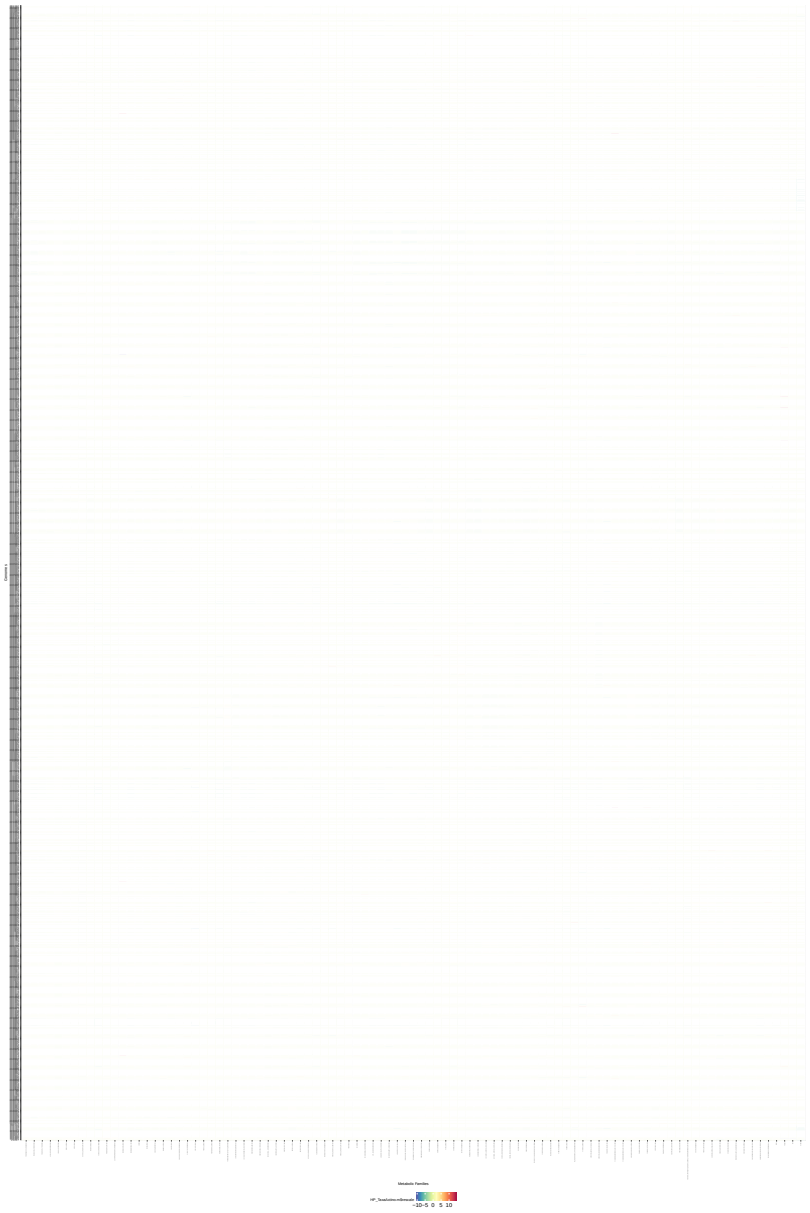

Figure 2: Actinobacterial Heatplot

Here is a reference to the HeatPlot: Figure 2.

PPP pahtway expansions restricted to *Streptomycetaceae* family HeatPlot: Figure 2.

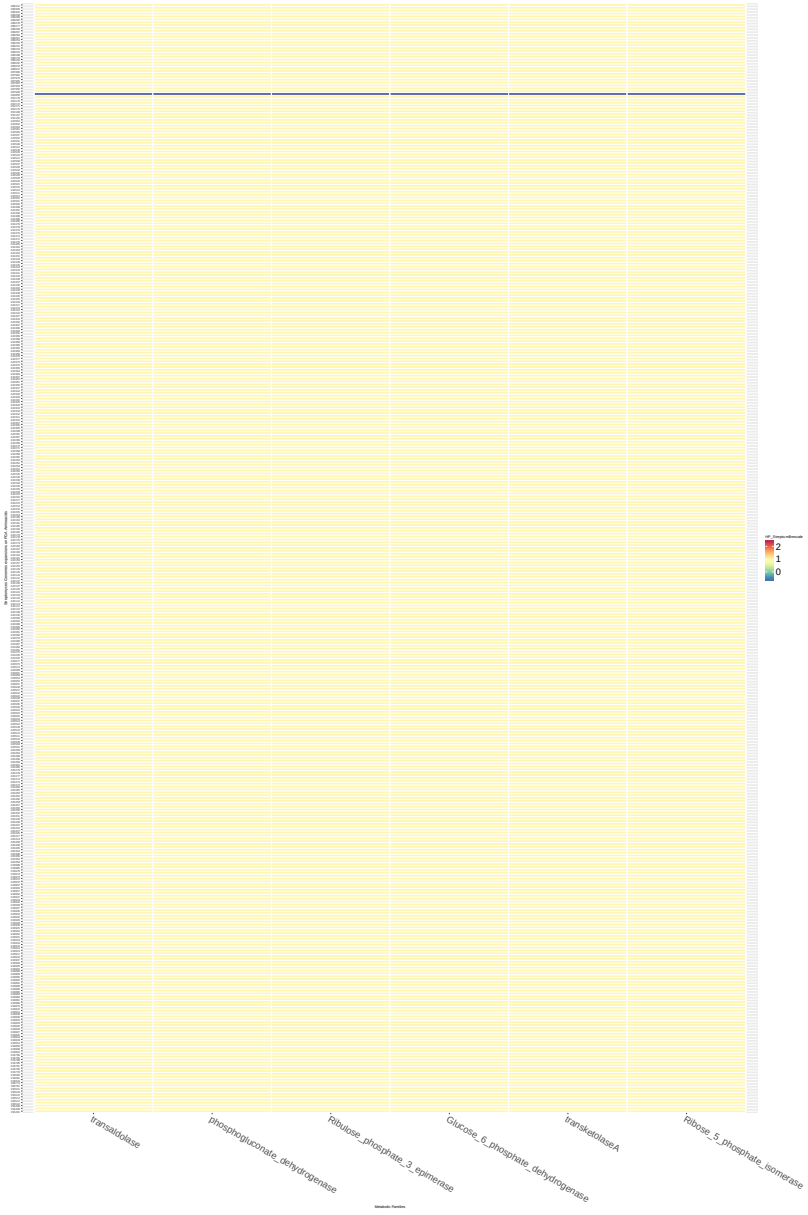


Figure 3: Streptomyces Genomes expansions on PGA Aminoacids HeatPlot

Here is a reference to the HeatPlot: Figure 3.

## Genome Size correlations

### Correlation between genome size and AntiSMASH products

```
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```
## Warning: Removed 1 rows containing missing values (geom_point).
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Genome size vs Total antismash cluster coloured by order

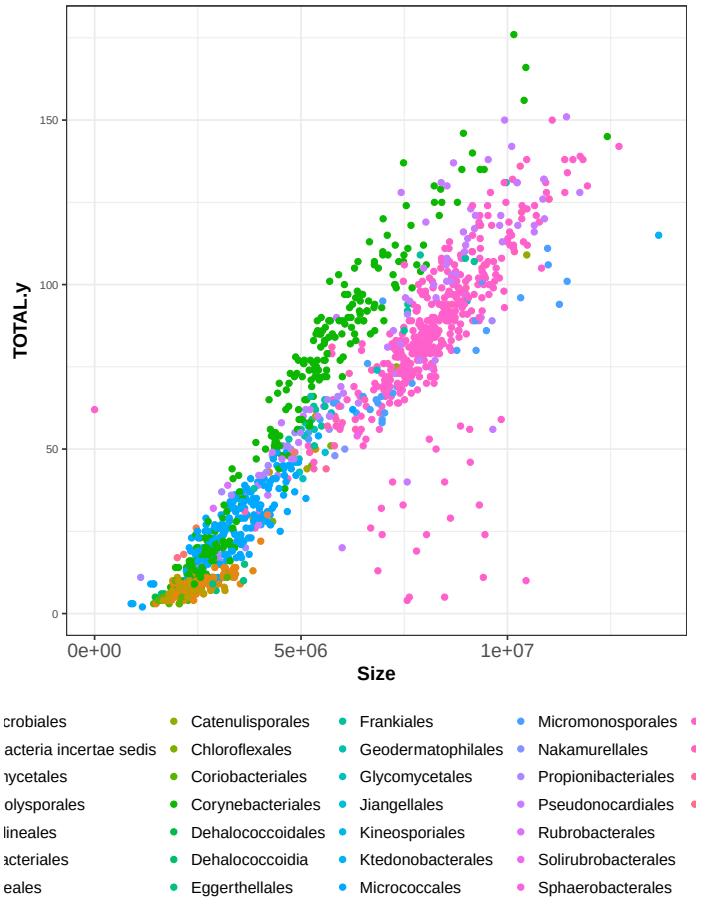


Figure 4: Correlation between Actinos genome size and antismash Natural products detection colored by Order

Here is a reference to Genome size vs Total antismash cluster: Figure 4.

Genome size vs Total antismash cluster detected splitted by order

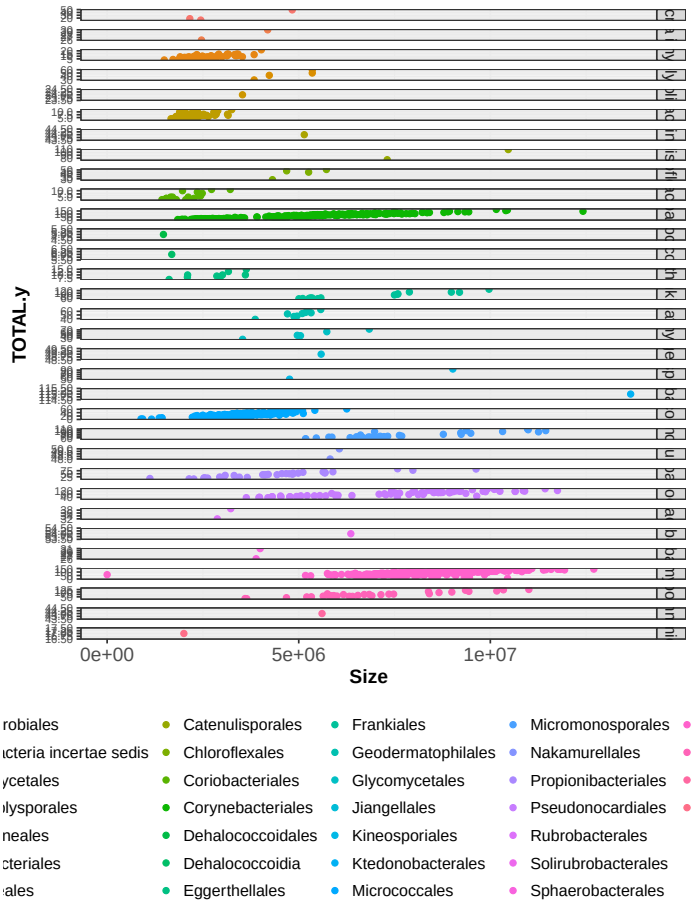


Figure 5: Correlation between Actinos genome size and antismash Natural products detection grided by Order

Here is a reference to Correlation between genome size and antismash Natural products detection grided by Order plot: Figure 5.

**Correlation between genome size and Central pathway expansions**

```
## Warning: Removed 1 rows containing missing values (geom_point).
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```

Genome size vs Total central pathway expansion coloured by order

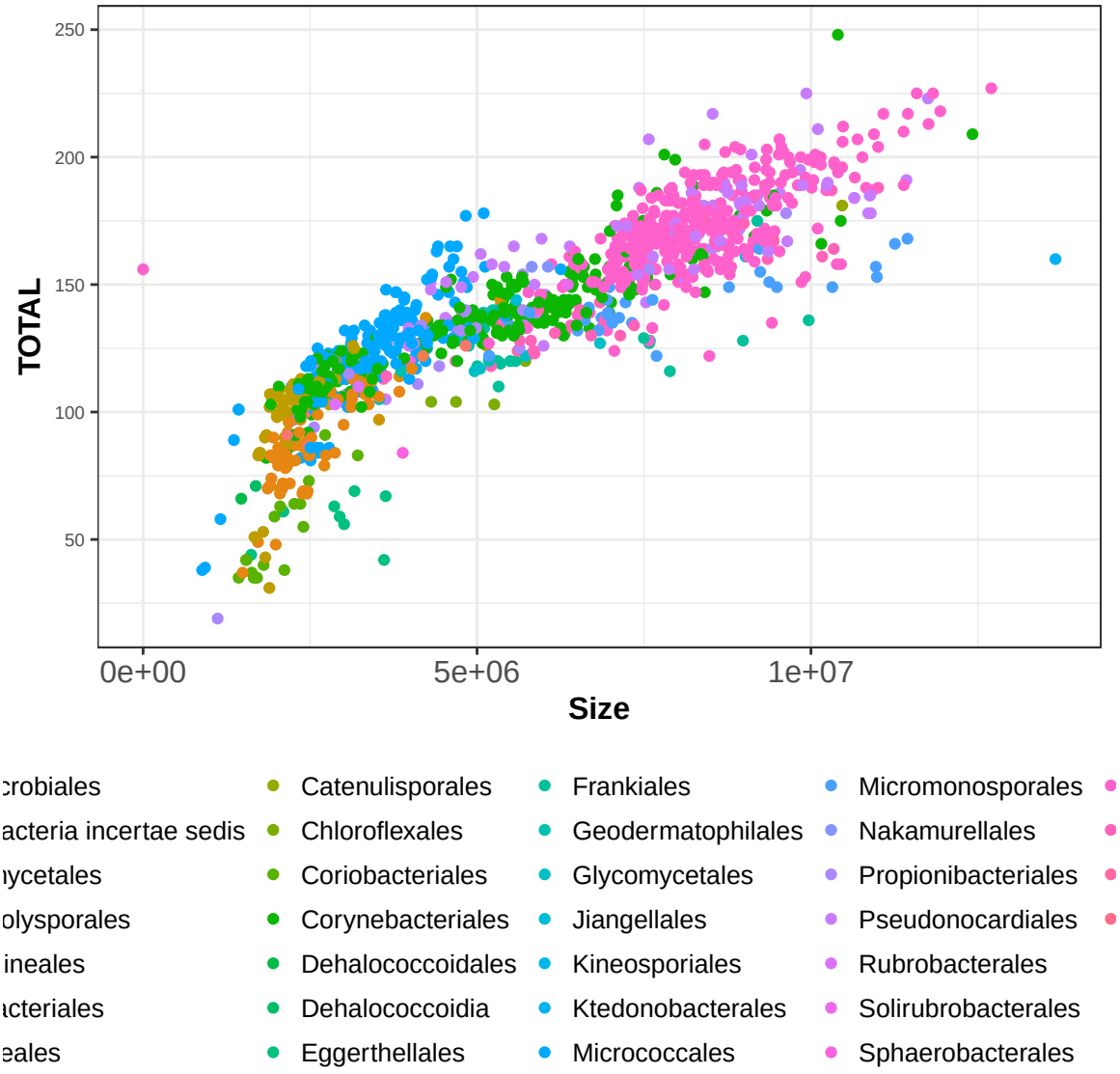


Figure 6: Correlation between Actinos genome size and central pathway expansions

Here is a reference to the size vs Total central pathway expansion plot: Figure 6.

Genome size vs Total central pathway expansion grided by order

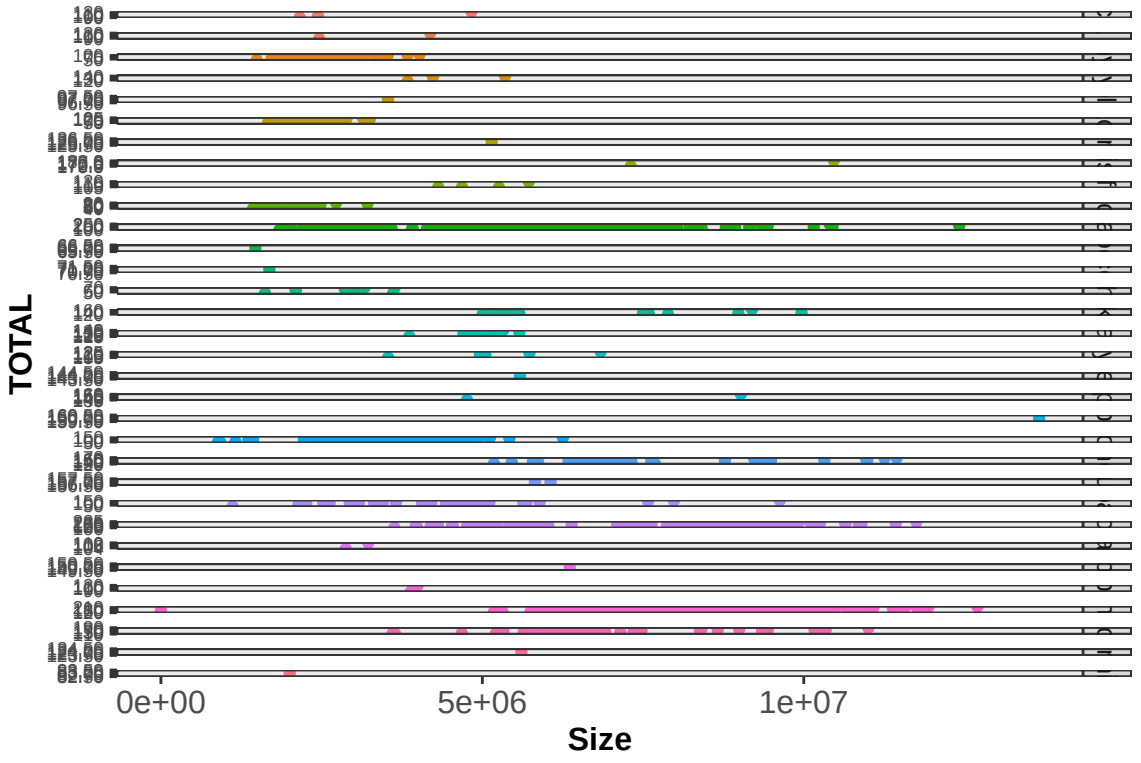


Figure 7: Correlation between Actinos genome size and central pathway expansions grided by order

Here is a reference to the Genome size vs Total central pathway expansion grided by order plot: Figure 7.

Correlation between genome size and each of the central pathway families. Data are coloured by metabolic family instead of coloured by taxonomical order. This treatment allows to answer how differente metabolic families grows when genome size grow.
Also I want to add form given by taxonomical order.

```
## Warning: The shape palette can deal with a maximum of 6 discrete values
## because more than 6 becomes difficult to discriminate; you have
## 32. Consider specifying shapes manually if you must have them.
```

```
## Warning: Removed 103306 rows containing missing values (geom_point).
```

```
## Warning: Removed 94 rows containing missing values (geom_point).
```

Genome size vs Total central pathway expansion coloured by metabolic Family

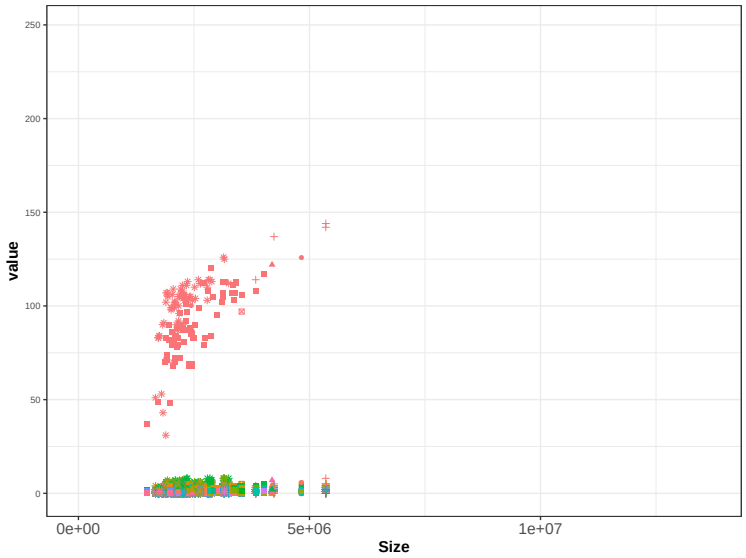


Figure 8: Correlation between Actinos Genome size vs Total central pathway expansion coloured by metabolic Family

Here is a reference to the Genome size vs Total central pathway expansion coloured by metabolic Family plot: Figure 8.

Future Work: Genome size vs Total central pathway expansion grided by metabolic Family For clarity I need to also grid and group by Metabolic Pathway

Here is a reference to Genome size vs Total central pathway expansion grided by metabolic Family plot: **??**.

## Natural products

### Natural products recruitments from EvoMining heatplot

We can see natural products recruitment after central pathways expansions colored by their kingdom. Natural products recruited by metabolic family, colored by phylogenetic origin.

Recruitments after central pathways expansions coloured by Kingdom

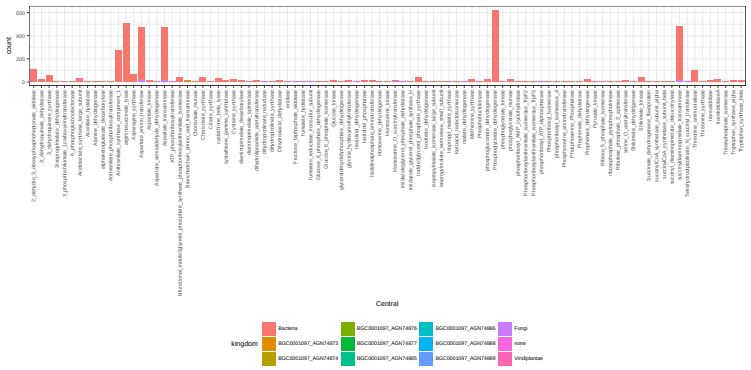


Figure 9: Actinos Recruitmens on central families coloured by kingdom

Here is a reference to Recruitments after central pathways expansions colourd by Kingdom plot: Figure 9.

Recruitments after central pathways expansions colourd by taxonomy

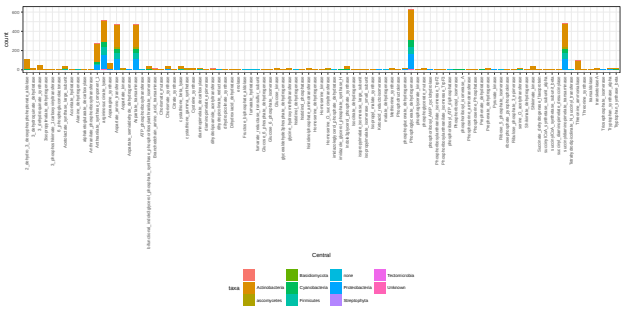


Figure 10: Actinos Recruitmens on central families coloured by taxonomy

Here is a reference to Recruitments after central pathways expansions colourd by taxa plot: Figure 10.

## Actinos AntiSMASH

Taxonomical diversity on Actinosbacteria Data

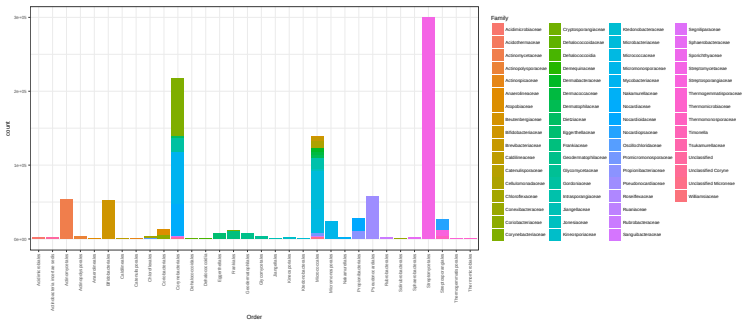


Figure 11: Actinos Diversity

Here is a reference to Recruitments after central pathways expansions colourd by taxa plot: Figure 11.

Smash diversity

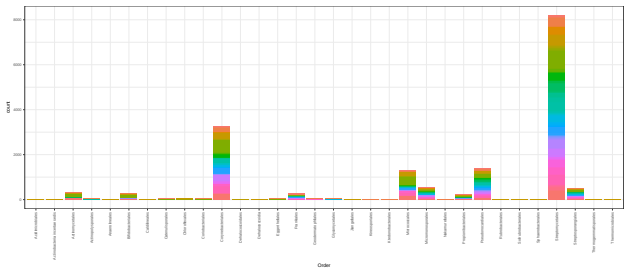

Figure 12: Actinos Smash Taxonomical Diversity

Here is a reference to Recruitments after central pathways expansions colourd by taxa plot: Figure 12.

### AntisSMASH vs Central Expansions

Is it a correlation between pangenome grow and central pathways expansions?

Total central pathway expansions by genome vs Total antismash cluster detected coloured by order

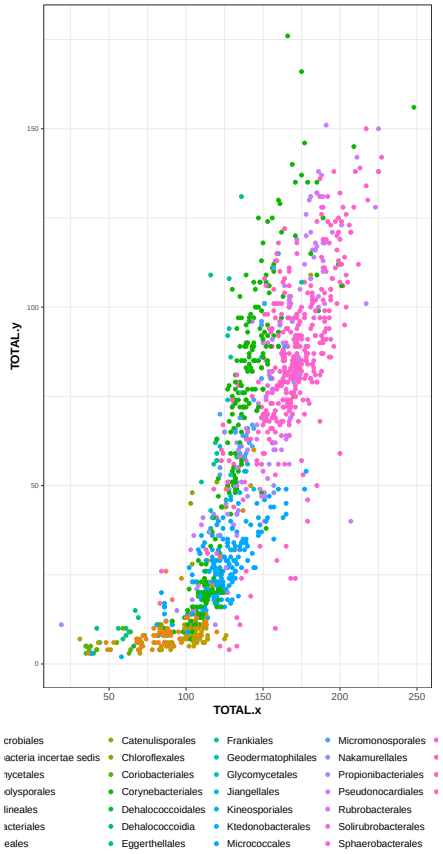


Figure 13: Correlation between Actinos central pathway expansions and antismash Natural products detection

Here is a reference to the expansions vs antismash NP's clusters plot: Figure 13.

Total central pathway expansions by genome vs Total antismash cluster detected splitted by order

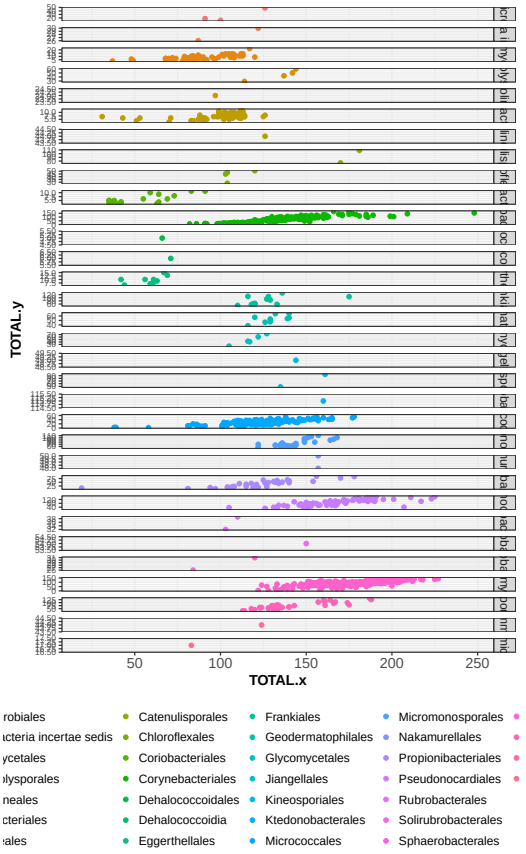


Figure 14: Correlation between Actinos central pathway expnasions and antismash Natural products detection

Here is a reference to the expansions vs antismash NP's clusters splitted by order plot Figure 14.

AntisMAsh vs Expansions by taxonomic Family

Natural products colured by family


Figure 15: Actinos Natural products by family

Here is a reference to the Natural products colured by family plot Figure 15.

## Selected trees from EvoMining

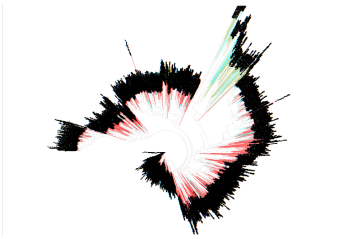

Figure 16: Enolase EvoMiningtree

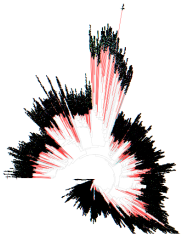

Figure 17: Phosphoribosyl isomerase EvoMiningtree

Figure 18: Phosphoribosyl isomerase A EvoMiningtree

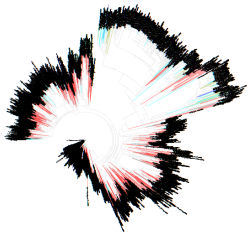

Figure 19: phosphoshikimate carboxyvinyltransferase EvoMiningtree