



## Supporting Online Material for

### **Response to Comment on “Positive Selection of Tyrosine Loss in Metazoan Evolution”**

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#### **This PDF file includes:**

SOM Text  
References

## Introduction

Su *et al.* stated that we failed to correct for the topology of the phylogenetic tree, which in turn may inflate the statistical significance level for the negative correlation observed between  $Num_{TyrKin}$  and  $Freq_{Tyr}$ . To address this criticism, we applied the same correction method used by Su *et al.*, namely the gradual Brownian model described in their supplementary material. Specifically, the sets of GC4- $Freq_{Tyr}$  and  $Num_{TyrKin}$ - $Freq_{Tyr}$  values and the species tree inferred by Su *et al.* were used as input to the Contrast program in the PHYLIP software suite to obtain their corresponding contrast values (1). The statistical significance of the correlation between sets of computed contrast values was subsequently calculated using the `cor.test` (correlation test, File `src/library/stats/R/cor.test.R`) function in the *R* statistical software.

## References

1. J. Felsenstein, *The American Naturalist* **125**, 1 (1985).

## Output of Contrast program in PHYLIP software suite

### GC4 versus $Freq_{Tyr}$

Contrasts (columns are different characters)

```
-----
-6.39602  -0.00085
-9.60316  -0.00430
12.75491  -0.00233
15.91684  -0.00435
24.12129  -0.01032
28.68026  -0.00487
-12.24052  0.00160
29.67667  -0.00601
-14.39343 -0.00301
-36.78292 -0.00147
26.99260  -0.00273
-22.70523  0.01068
27.42272  -0.00757
```

Covariance matrix

```
-----
503.1062  -0.0819
-0.0819   0.0000
```

Regressions (columns on rows)

```
-----
      1.0000   -0.0002
-2645.8561    1.0000
```

Correlations

```
-----
      1.0000   -0.6563
     -0.6563    1.0000
```

**Num<sub>TyrKin</sub> versus Freq<sub>Tyr</sub>**

Contrasts (columns are different characters)

```
-----
      21.32007  -0.00085
      35.21888  -0.00430
     -14.72344  -0.00233
      28.97096  -0.00435
      66.04036  -0.01032
      35.85033  -0.00487
     -99.57755   0.00160
      84.48987  -0.00601
       1.67365  -0.00301
      70.98593  -0.00147
     -17.39943  -0.00273
    -120.60730   0.01068
     114.03644  -0.00757
```

Covariance matrix

```
-----
      4488.2142  -0.3075
       -0.3075   0.0000
```

Regressions (columns on rows)

```
-----
      1.0000   -0.0001
    -9933.4165    1.0000
```

Correlations

```
-----
      1.0000   -0.8249
     -0.8249    1.0000
```