

# feature\_\_significance

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```
infiles = c('genes_CEFITH_standardized.txt', 'RDP_family_AH_standardized.txt',
            'RDP_genus_AH_standardized.txt', 'OTU_AH_standardized.txt')

otu_mat = preprocess_mat(infiles[4])
genes_mat = preprocess_mat(infiles[1])

log_transform = function(x) {
  x = x[!is.na(x)]
  constant = min(x[x > 0])/2.
  x = x + constant
  x = x/sum(x)
  log(x)
}

prot_000000000877 = log_transform(genes_mat[, 'prot_000000000877'])
otu_11 = log_transform(otu_mat[, 'OTU_11'])

mapping_maria = load_data_table('mapping_maria_BL.txt')

dependent = as.numeric(mapping_maria$Persistence)
lm_prot_000000000877 = lm(dependent~prot_000000000877)
lm_otu_11 = lm(dependent~otu_11)

summary(lm_prot_000000000877)
```

```
##
## Call:
## lm(formula = dependent ~ prot_000000000877)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.75985 -0.15610  0.01232  0.24015  0.75752
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -0.02131    0.30613  -0.070  0.945198
## prot_000000000877 -0.40452    0.08673  -4.664  0.000149 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3492 on 20 degrees of freedom
## Multiple R-squared:  0.521, Adjusted R-squared:  0.497
## F-statistic: 21.75 on 1 and 20 DF, p-value: 0.0001494
```

```
summary(lm_otu_11)
```

```
##
## Call:
## lm(formula = dependent ~ otu_11)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.4458 -0.3158 -0.1415  0.3964  1.0844
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   0.3633     0.4308   0.843  0.4090
## otu_11        -0.2988     0.1255  -2.380  0.0274 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4454 on 20 degrees of freedom
## Multiple R-squared:  0.2207, Adjusted R-squared:  0.1818
## F-statistic: 5.666 on 1 and 20 DF,  p-value: 0.02736
```

```
coxtest(lm_prot_000000000877, lm_otu_11)
```

```
## Cox test
##
## Model 1: dependent ~ prot_000000000877
## Model 2: dependent ~ otu_11
##              Estimate Std. Error z value Pr(>|z|)
## fitted(M1) ~ M2  -1.6140     1.01310 -1.5931  0.1111
## fitted(M2) ~ M1  -7.6319     0.79176 -9.6392  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
jtest(lm_prot_000000000877, lm_otu_11)
```

```
## J test
##
## Model 1: dependent ~ prot_000000000877
## Model 2: dependent ~ otu_11
##              Estimate Std. Error t value Pr(>|t|)
## M1 + fitted(M2)  0.41233     0.36275  1.1367 0.269806
## M2 + fitted(M1)  0.88384     0.23612  3.7432 0.001377 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```