**File S2 - Supplementary material - Comparison of DEG elicited by a transient androgen increase and a social challenge**

In order to compare differentially expressed genes (DEG) between a transient androgen increase and a social challenge, we have compared the DEG lists for each time sampling in the present study with the DEG lists elicited by a territorial intrusion in another fish species for which this data is available (three-spined stickleback, *Gasterosteus aculeatus*, Bukhari et al. 2017). Raw data from OrthoDB v9.1 (Zdobnov et al. 2017) was used to map orthologous genes between the two species. Briefly, the database was first filtered for the two species of interest, and subsequently the orthogroups at the Actinopterygii level common to both species were identified, totaling 15,033 orthogroups. All paralogs inside each orthogroup for the individual species were kept, representing 17,911 genes in tilapia and 17,320 in stickleback. The R package GeneOverlap 1.22 (Shen and Sinai 2019) was used to assess the significance of the overlap between the orthogroup lists between tilapia and stickleback, using the total number of orthologs common to both species as the genome size. The results are presented in the table below.

**Table S.10 –** Comparison of DEG elicited by a transient androgen increase in the tilapia (Til) and a social challenge in the stickleback (S). Detailed information obtained with the GeneOverlap R package, namely contingency tables, overlapping p-values, odds ratio (OR), Jaccard Index (J), and overlapping genes. DEG obtained for the KT- and T-treated groups in the tilapia were compared with the DEG reported for the telencephalon (Tel) and Diencephalon (Diec) in the stickleback, for the same time points (30 and 60 min).

| | | Stickleback | | | |
|---|---|---|---|---|---|
| | | **Tel_30** | **Diec_30** | **Tel_60** | **Diec_60** |
| **Tilapia** | **KT_30** | Contingency Table:<br>　　　　notS　inS<br>notTil 14572　209<br>inTil　　249　　3<br><br>p-value=0.69<br>OR=0.8<br>J=0.0<br><br>Overlap genes:<br>EOG090C0054 - myosin XVAb; EOG090C01O0 - desmoglein 2 like; EOG090C09K2 - keratin 18 | Contingency Table:<br>　　　　notS　inS<br>notTil 14661　120<br>inTil　　252　　0<br><br>p-value=1<br>OR=0.0<br>J=0.0<br><br>Overlap genes: none | | |
| | **T_30** | Contingency Table:<br>　　　　notS　inS<br>notTil　14761 210<br>inTil　　　60　　2<br><br>p-value=0.22<br>OR=2.3<br>J=0.0<br><br>Overlap genes:<br>EOG090C00XK – Uncharacterized;<br>EOG090C0054 - myosin XVAb | Contingency Table:<br>　　　　notS　inS<br>notTil　14852　119<br>inTil　　　61　　1<br><br>p-value=0.39<br>OR=2.0<br>J=0.0<br><br>Overlap genes:<br>EOG090C00XK - Uncharacterized | | |
| | **KT_60** | | | Contingency Table:<br>　　　　notS　inS<br>notTil　14455　577<br>inTil　　　1　　0<br><br>p-value=1<br>OR=0.0<br>J=0.0<br><br>Overlap genes: none | Contingency Table:<br>　　　　notS　inS<br>notTil　14505　527<br>inTil　　　1　　0<br><br>p-value=1<br>OR=0.0<br>J=0.0<br><br>Overlap genes: none |
| | **T_60** | | | Contingency Table:<br>　　　　notS　inS<br>notTil　14452　576<br>inTil　　　4　　1<br><br>p-value=0.18<br>OR=6.3<br>J=0.0<br><br>Overlap genes:<br>EOG090C00AM -plexin A1 | Contingency Table:<br>　　　　notS　inS<br>notTil　14501　527<br>inTil　　　5　　0<br><br>p-value=1<br>OR=0.0<br>J=0.0<br><br>Overlap genes: none |

## References

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