**Supplementary material for publication " Genome-wide analysis of long non-coding RNA profiles in canine oral melanomas" from Hitte et al.**

**Supplementary Figure 1.** Heatmap of xcell enrichment in 64 cell type with respect to the 52 control/healthy and tumor canine samples. The scale (red/blue) colors indicates whether a sample is enriched (red) or not (blue) for a particular cell-type signature. The status (healthy in light red versus tumor in light blue) and the sampled location(s) are represented on the right panels for each sample.



**Supplementary Figure 2.** Principal Component Analysis (PCA) of the 52 samples based on the **lncRNA** gene normalized counts with control/healthy sample and tumor samples in red and green, respectively.



**Supplementary Figure 3.** Module-trait associations for poodle samples. **(a)** Each row corresponds to a ME (module eigengene), and the column to the poodle mucosal melanoma. Each cell contains the corresponding correlation and p-value with melanoma. The figure is color-coded according to the strength of the correlation (red: positive correlations; blue: negative correlations). Modules Yellow, Tan, Orange, palevioletred, darkorange and orangedred4 are positively correlated (PCC>0.8; p<6e-07). **(b)** Modules with negative correlation according to the strength of the correlation. Module Brown and Mediumorchid are the most significantly negatively correlated (p<1e-15).

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**Supplementary Figure 4.** GO terms (Biological Process) enriched for (a) positively correlated and (b) negatively correlated modules with oral melanoma: Top ten enriched GO items are represented.

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**Supplementary Figure 5.** Breed-specific differential expression of lncRNA RLOC\_0005829 (COLCA1). Log2 of normalized count on the y-axis for control (red) versus tumor (blue) samples for golden retrievers (left panel) versus poodles (right panel)



**Supplementary Table 1.** Summary statistics the RNASeq mapping processe for the 52 samples:

|  |  |  |  |
| --- | --- | --- | --- |
| sample\_id | total\_reads | mapped\_reads | pct\_mapped |
| H01\_GRET | 114905418 | 109642636 | 95.4199 |
| H01\_LABR | 102060738 | 97938964 | 95.9614 |
| H02\_GRET | 116303444 | 111676186 | 96.0214 |
| H02\_PODL | 115579956 | 108119950 | 93.5456 |
| H03\_GRET | 101617962 | 95662328 | 94.1392 |
| H03\_PODL | 95705334 | 90740286 | 94.8122 |
| H04\_PODL | 100513348 | 95351416 | 94.8644 |
| H06\_GRET | 123108392 | 117705856 | 95.6116 |
| H06\_PODL | 122237464 | 116835596 | 95.5808 |
| H07\_PODL | 104765400 | 100429218 | 95.8611 |
| H08\_PODL | 127577638 | 122485416 | 96.0085 |
| H09\_PODL | 122256708 | 115618482 | 94.5703 |
| H12\_PODL | 152311560 | 142131396 | 93.3162 |
| T01\_GRET | 119742150 | 113552482 | 94.8308 |
| T01\_LABR | 103997760 | 98375058 | 94.5934 |
| T01\_PODL | 125795232 | 115560294 | 91.8638 |
| T02\_GRET | 111188146 | 104754146 | 94.2134 |
| T02\_LABR | 117748272 | 112530866 | 95.569 |
| T02\_PODL | 94925824 | 88850866 | 93.6003 |
| T03\_GRET | 130238842 | 116883454 | 89.7455 |
| T03\_PODL | 86720270 | 82059442 | 94.6254 |
| T04\_GRET | 102774558 | 98010058 | 95.3641 |
| T04\_PODL | 132289310 | 125515066 | 94.8792 |
| T05\_LABR | 113531352 | 107357078 | 94.5616 |
| T05\_PODL | 96974182 | 91707760 | 94.5693 |
| T06\_GRET | 106128548 | 100660864 | 94.8481 |
| T06\_LABR | 97256470 | 92496866 | 95.1061 |
| T06\_PODL | 101797096 | 95964134 | 94.27 |
| T07\_GRET | 105498510 | 98986656 | 93.8275 |
| T07\_PODL | 94957170 | 89827360 | 94.5978 |
| T08\_GRET | 106548606 | 100440800 | 94.2676 |
| T08\_LABR | 102694776 | 96991868 | 94.4467 |
| T08\_PODL | 100125334 | 95125576 | 95.0065 |
| T09\_GRET | 120683698 | 113721778 | 94.2313 |
| T09\_LABR | 110032172 | 104250598 | 94.7456 |
| T09\_PODL | 99976306 | 93809504 | 93.8317 |
| T10\_LABR | 108000438 | 102370000 | 94.7867 |
| T11\_GRET | 121441158 | 115316112 | 94.9564 |
| T11\_LABR | 108637932 | 103477814 | 95.2502 |
| T12\_GRET | 122557258 | 116710318 | 95.2292 |
| T12\_LABR | 114603244 | 108376544 | 94.5667 |
| T12\_PODL | 95565878 | 89492478 | 93.6448 |
| T13\_GRET | 127578536 | 121658572 | 95.3597 |
| T13\_LABR | 87928130 | 83859136 | 95.3724 |
| T14\_GRET | 112779000 | 106870816 | 94.7613 |
| T15\_GRET | 110387888 | 105013088 | 95.131 |
| T15\_LABR | 117853920 | 112352020 | 95.3316 |
| T16\_GRET | 92061920 | 86920024 | 94.4147 |
| T17\_GRET | 106246074 | 100475354 | 94.5685 |
| T17\_LABR | 86790284 | 81724812 | 94.1635 |
| T18\_LABR | 105127638 | 98654102 | 93.8422 |
| T19\_GRET | 100523080 | 95593834 | 95.0964 |

**Supplementary Table 2.** Diagnostic, locations, sex, biobank\_Id accessions of the 52 samples:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| sample\_id | id\_caniDNA | id\_CCOGC | sex | diagnostic | primary\_tumor | location |
| H02\_PODL | 3579 | B00EA4K | M | oral\_melanoma | NA | gingiva |
| T02\_PODL | 3579 | B00EA4L | M | oral\_melanoma | NA | gingiva |
| H03\_PODL | 3923 | B00EA4M | F | oral\_melanoma | NA | tong |
| T03\_PODL | 3923 | B00EA4N | F | oral\_melanoma | NA | tong |
| H04\_PODL | 4002 | B00EA4O | NA | oral\_melanoma | NA | lip |
| T04\_PODL | 4002 | B00EA4P | NA | oral\_melanoma | NA | lip |
| T01\_PODL | 4159 | B00EA4J | M | oral\_melanoma | NA | gingiva |
| T04\_GRET | 4181 | B00FIO9 | M | oral\_melanoma | NA | cheek |
| T05\_LABR | 4207 | B00FIOT | F | oral\_melanoma | NA | NA |
| H02\_GRET | 4227 | B00EA54 | F | oral\_melanoma | NA | tong |
| T02\_GRET | 4227 | B00EA55 | F | oral\_melanoma | NA | tong |
| T02\_LABR | 4285 | B00FIO1 | M | oral\_melanoma | NA | mandible |
| T05\_PODL | 4483 | B00EA4R | M | oral\_melanoma | NA | NA |
| H06\_PODL | 4827 | B00EA4S | M | oral\_melanoma | NA | NA |
| T06\_PODL | 4827 | B00EA4T | M | oral\_melanoma | NA | NA |
| H07\_PODL | 5224 | B00EA4U | M | oral\_melanoma | primary\_tumor | gingiva |
| T07\_PODL | 5224 | B00EA4V | M | oral\_melanoma | primary\_tumor | gingiva |
| H01\_GRET | 5302 | B00FIOH | M | oral\_melanoma | primary\_tumor | lip |
| T01\_GRET | 5302 | B00FIOI | M | oral\_melanoma | primary\_tumor | lip |
| H01\_LABR | 5720 | B00EA5E | M | oral\_melanoma | primary\_tumor | tong |
| T01\_LABR | 5720 | B00EA5F | M | oral\_melanoma | primary\_tumor | tong |
| H09\_PODL | 6528 | B00EA4Y | F | oral\_melanoma | primary\_tumor | tong |
| T09\_PODL | 6528 | B00EA4Z | F | oral\_melanoma | primary\_tumor | tong |
| H03\_GRET | 7106 | B00EA56 | M | oral\_melanoma | NA | lip |
| T03\_GRET | 7106 | B00EA57 | M | oral\_melanoma | NA | lip |
| H12\_PODL | 7855 | B00EA52 | F | oral\_melanoma | NA | gingiva |
| T12\_PODL | 7855 | B00EA53 | F | oral\_melanoma | NA | gingiva |
| H06\_GRET | 10271 | B00EA7P | F | oral\_melanoma | NA | NA |
| T06\_GRET | 10271 | B00EA7O | F | oral\_melanoma | NA | NA |
| T06\_LABR | 10501 | B00EA7Q | M | oral\_melanoma | NA | NA |
| T07\_GRET | CCOGC | CCB010032 | NA | oral\_melanoma | primary\_tumor | lip |
| T08\_GRET | CCOGC | CCB010284 | NA | oral\_melanoma | primary\_tumor | tong |
| T08\_LABR | CCOGC | CCB010318 | NA | oral\_melanoma | primary\_tumor | maxilla |
| T09\_GRET | CCOGC | CCB010326 | NA | oral\_melanoma | primary\_tumor | mandible |
| T09\_LABR | CCOGC | CCB030038 | NA | melanoma | NA | NA |
| T10\_LABR | CCOGC | CCB030039 | NA | oral\_melanoma | primary\_tumor | maxilla |
| T11\_GRET | CCOGC | CCB030075 | NA | oral\_melanoma | primary\_tumor | maxilla |
| T11\_LABR | CCOGC | CCB030097 | NA | melanoma | NA | NA |
| T12\_GRET | CCOGC | CCB030120 | NA | oral\_melanoma | primary\_tumor | maxilla |
| T12\_LABR | CCOGC | CCB030183 | NA | oral\_melanoma | primary\_tumor | lymph\_node |
| T13\_GRET | CCOGC | CCB030165 | NA | oral\_melanoma | primary\_tumor | tong |
| T13\_LABR | CCOGC | CCB030269 | NA | oral\_melanoma | primary\_tumor | skin |
| T14\_GRET | CCOGC | CCB030201 | NA | oral\_melanoma | primary\_tumor | maxilla |
| T15\_GRET | CCOGC | CCB030227 | NA | oral\_melanoma | primary\_tumor | NA |
| T15\_LABR | CCOGC | CCB050023 | NA | melanoma | NA | NA |
| T16\_GRET | CCOGC | CCB030342 | NA | melanoma | NA | NA |
| T17\_GRET | CCOGC | CCB050061 | NA | melanoma | NA | NA |
| T17\_LABR | CCOGC | CCB050096 | NA | oral\_melanoma | primary\_tumor | mandible |
| T18\_LABR | CCOGC | CCB050228 | NA | oral\_melanoma | primary\_tumor | tong |
| T19\_GRET | CCOGC | CCB030273 | NA | oral\_melanoma | primary\_tumor | mandible |
| H08\_PODL | NA | B00EA4W | NA | melanoma | NA | NA |
| T08\_PODL | NA | B00EA4X | NA | melanoma | NA | NA |

**Supplementary Table 3** Characterization of the 140 DE canine lncRNA mapped to the human genome:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| canfam3.1+\_id | dog\_ensembl\_id | dog\_gene\_name | dog\_biotype | baseMean | log2FoldChange | padj | human\_gencode\_name | human\_minimap\_grch38\_location | blastId |
| RLOC\_00001826 | NA | NA | antisense\_mRNA | 3.517 | -6.6 | 0.001 | NA | 8:19400195-19400456 | 0.792 |
| RLOC\_00020145 | NA | NA | lincRNA | 4.214 | -5.454 | 0.003 | NA | 6:37127933-37129124 | 0.713 |
| RLOC\_00013063 | NA | NA | antisense\_mRNA | 7.741 | -5.31 | 0.001 | NA | 9:124482877-124483033 | 0.91 |
| RLOC\_00011253 | NA | NA | antisense\_mRNA | 2.327 | -5.309 | 0.003 | NA | 8:78661484-78661610 | 0.898 |
| RLOC\_00009916 | NA | NA | lincRNA | 22.705 | -5.272 | 0 | NA | 1:10806922-10808221 | 0.995 |
| RLOC\_00003953 | NA | NA | lincRNA | 139.13 | -5.017 | 0 | NA | 6:167699625-167699795 | 0.876 |
| RLOC\_00036091 | NA | NA | lincRNA | 26.722 | -4.733 | 0 | NA | 3:194061717-194061912 | 0.908 |
| RLOC\_00008917 | NA | NA | antisense\_mRNA | 85.695 | -4.619 | 0 | NA | 5:139418765-139439872 | 0.747 |
| RLOC\_00011395 | NA | NA | lincRNA | 47.425 | -4.268 | 0 | NA | 8:94613434-94613666 | 0.991 |
| RLOC\_00010651 | NA | NA | lincRNA | 70.931 | -4.178 | 0.016 | NA | 13:73573243-73631916 | 0.987 |
| RLOC\_00023851 | NA | NA | lincRNA | 75.928 | -4.133 | 0 | NA | 1:226262092-226263452 | 0.713 |
| RLOC\_00002766 | NA | NA | lincRNA | 9.026 | -4.04 | 0.004 | NA | 15:85828889-85829657 | 0.764 |
| RLOC\_00032101 | NA | NA | antisense\_mRNA | 33.778 | -4.007 | 0 | NA | 3:184746767-184748790 | 0.755 |
| RLOC\_00024752 | NA | NA | lincRNA | 507.008 | -3.985 | 0.001 | NA | 1:152946212-152950093 | 0.722 |
| RLOC\_00016405 | NA | NA | lincRNA | 13.174 | -3.974 | 0.013 | NA | 15:38699513-38704947 | 0.746 |
| RLOC\_00009407 | NA | NA | lincRNA | 20.422 | -3.918 | 0.001 | NA | 16:49861297-49862988 | 0.726 |
| RLOC\_00036225 | NA | NA | lincRNA | 5.583 | -3.703 | 0.004 | NA | 3:29279923-29281756 | 0.814 |
| RLOC\_00034858 | NA | NA | lincRNA | 26.118 | -3.693 | 0.001 | AC016903.1 | 2:204467218-204476382 | 0.77 |
| RLOC\_00003240 | NA | NA | lincRNA | 7.407 | -3.655 | 0.004 | NA | 4:26021479-26024276 | 0.733 |
| RLOC\_00031699 | NA | NA | antisense\_mRNA | 2.357 | -3.629 | 0.014 | NA | 7:33533142-33535108 | 0.774 |
| RLOC\_00000822 | NA | NA | antisense\_mRNA | 112.529 | -3.52 | 0 | NA | X:101349026-101371719 | 0.78 |
| RLOC\_00003439 | NA | NA | lincRNA | 207.919 | -3.517 | 0 | NA | 18:70469817-70475663 | 0.986 |
| RLOC\_00028807 | NA | NA | antisense\_mRNA | 353.137 | -3.409 | 0 | AC010503.4 | 19:6460555-6470378 | 0.74 |
| RLOC\_00027293 | NA | NA | antisense\_mRNA | 33.738 | -3.404 | 0.005 | NA | 18:26389353-26390048 | 0.781 |
| RLOC\_00021053 | NA | NA | lincRNA | 17.176 | -3.346 | 0 | NA | 8:116321704-116387023 | 0.711 |
| RLOC\_00020119 | NA | NA | antisense\_mRNA | 11.089 | -3.327 | 0.007 | NA | 6:36138249-36140394 | 0.725 |
| RLOC\_00023406 | NA | NA | antisense\_mRNA | 3.847 | -3.304 | 0.012 | NA | 12:18945625-19066744 | 0.709 |
| RLOC\_00017738 | NA | NA | antisense\_mRNA | 10.453 | -3.255 | 0.002 | NA | 9:97773665-97774215 | 0.811 |
| RLOC\_00007749 | NA | NA | lincRNA | 4.853 | -3.069 | 0.021 | NA | 12:102502194-102633029 | 0.724 |
| RLOC\_00012058 | NA | NA | antisense\_mRNA | 5.652 | -3.057 | 0.017 | NA | 17:40980564-40985072 | 0.789 |
| RLOC\_00001518 | NA | NA | lincRNA | 78.776 | -3.055 | 0.011 | EPHA1-AS1 | 7:143413268-143416558 | 0.717 |
| RLOC\_00010776 | NA | NA | lincRNA | 9.665 | -2.974 | 0.003 | SOX21-AS1 | 13:94713461-94718179 | 0.732 |
| RLOC\_00030864 | NA | NA | lincRNA | 11.653 | -2.927 | 0.002 | NA | 2:177318672-177345751 | 0.731 |
| RLOC\_00010214 | NA | NA | lincRNA | 908.67 | -2.849 | 0.008 | NA | 21:37546740-37547661 | 0.99 |
| RLOC\_00022985 | NA | NA | lincRNA | 9.462 | -2.783 | 0.02 | NA | 12:53242825-53245684 | 0.781 |
| RLOC\_00005492 | NA | NA | lincRNA | 51.276 | -2.728 | 0.012 | NA | 11:129311990-129312596 | 0.708 |
| RLOC\_00023961 | NA | NA | antisense\_mRNA | 13.669 | -2.685 | 0 | NA | 20:59098490-59098862 | 0.794 |
| RLOC\_00026330 | NA | NA | lincRNA | 11.054 | -2.669 | 0.022 | MIR29B2CHG | 1:207821308-207824899 | 0.804 |
| RLOC\_00030709 | NA | NA | antisense\_mRNA | 99.031 | -2.659 | 0.001 | LINC02586 | 1:110207838-110213072 | 0.709 |
| RLOC\_00004345 | NA | NA | antisense\_mRNA | 23.181 | -2.596 | 0.004 | NA | 9:68533592-68537962 | 0.712 |
| RLOC\_00002364 | NA | NA | lincRNA | 4.344 | -2.57 | 0.009 | NA | 5:96150143-96159185 | 0.794 |
| RLOC\_00007180 | NA | NA | antisense\_mRNA | 4.719 | -2.459 | 0.014 | NA | 1:36321280-36322814 | 0.755 |
| RLOC\_00011453 | NA | NA | antisense\_mRNA | 37.809 | -2.452 | 0.012 | NA | 17:82036855-82037018 | 0.933 |
| RLOC\_00004293 | NA | NA | lincRNA | 12.243 | -2.382 | 0.026 | NA | 9:72474981-72482475 | 0.938 |
| RLOC\_00025023 | NA | NA | antisense\_mRNA | 74.549 | -2.365 | 0.002 | NA | 3:113289143-113298453 | 0.708 |
| RLOC\_00019902 | NA | NA | lincRNA | 8.806 | -2.341 | 0.009 | NA | 10:88866630-88866996 | 0.785 |
| RLOC\_00021785 | NA | NA | lincRNA | 10.668 | -2.333 | 0.018 | NA | 6:6875783-6882303 | 0.73 |
| RLOC\_00003692 | NA | NA | antisense\_mRNA | 24.557 | -2.317 | 0 | NA | 19:5576518-5576945 | 0.998 |
| RLOC\_00013173 | NA | NA | lincRNA | 4.473 | -2.279 | 0.036 | NA | 12:56773889-56774167 | 0.792 |
| RLOC\_00032064 | NA | NA | antisense\_mRNA | 122.45 | -2.267 | 0.003 | NA | 17:42797643-42798699 | 0.996 |
| RLOC\_00012258 | NA | NA | lincRNA | 5.215 | -2.258 | 0.032 | TOB1-AS1 | 17:50909366-50910825 | 0.717 |
| RLOC\_00015461 | NA | NA | lincRNA | 89.328 | -2.254 | 0.01 | NA | 14:72969456-73024912 | 0.851 |
| RLOC\_00018322 | NA | NA | lincRNA | 21.454 | -2.254 | 0.012 | NA | 11:44055902-44056406 | 0.73 |
| RLOC\_00019548 | NA | NA | lincRNA | 14.417 | -2.214 | 0.035 | AL049536.1 | 22:27413684-27436165 | 0.768 |
| RLOC\_00015465 | NA | NA | lincRNA | 21.455 | -2.201 | 0.001 | LINC01588 | 14:50037486-50039627 | 0.794 |
| RLOC\_00018883 | NA | NA | antisense\_mRNA | 1.375 | -2.195 | 0.047 | NA | 11:66720065-66722150 | 0.707 |
| RLOC\_00011750 | NA | NA | antisense\_mRNA | 94.508 | -2.179 | 0 | NA | 17:46304000-46306307 | 0.726 |
| RLOC\_00005489 | NA | NA | lincRNA | 25.88 | -2.17 | 0.035 | NA | 11:129583155-129699041 | 0.947 |
| RLOC\_00026547 | NA | NA | lincRNA | 36.763 | -2.159 | 0 | NA | 1:179019960-179024746 | 0.975 |
| RLOC\_00010989 | NA | NA | antisense\_mRNA | 3.811 | -2.12 | 0.046 | NA | 8:48763828-48764820 | 0.782 |
| RLOC\_00016055 | NA | NA | antisense\_mRNA | 237.217 | -2.107 | 0.002 | NA | 14:99510739-99512729 | 0.861 |
| RLOC\_00029149 | NA | NA | lincRNA | 14.387 | -2.052 | 0.013 | NA | 10:91574959-91575491 | 0.757 |
| RLOC\_00011768 | NA | NA | antisense\_mRNA | 17.797 | -2.05 | 0.017 | AC005821.1 | 17:62705998-62725162 | 0.714 |
| RLOC\_00019077 | NA | NA | antisense\_mRNA | 50.134 | -2.022 | 0.017 | NA | 11:62355541-62358073 | 0.994 |
| RLOC\_00003758 | NA | NA | lincRNA | 55.632 | -2.009 | 0.039 | NA | 6:148193491-148197294 | 0.743 |
| RLOC\_00010227 | NA | NA | lincRNA | 64.73 | -1.999 | 0.011 | NA | 21:38744031-38745414 | 0.812 |
| RLOC\_00021073 | NA | NA | lincRNA | 20.272 | -1.972 | 0.038 | NA | 8:119281368-119281906 | 0.821 |
| RLOC\_00035571 | NA | NA | antisense\_mRNA | 27.935 | -1.965 | 0.002 | NA | 3:141738158-141738558 | 0.88 |
| RLOC\_00023318 | NA | NA | lincRNA | 20.213 | -1.961 | 0.002 | NA | 12:26833827-26835177 | 0.737 |
| RLOC\_00008560 | NA | NA | antisense\_mRNA | 21.651 | -1.942 | 0 | NA | X:136874171-136874391 | 1 |
| RLOC\_00020746 | NA | NA | antisense\_mRNA | 14.802 | -1.927 | 0.034 | NA | 6:105256664-105258650 | 0.785 |
| RLOC\_00033106 | NA | NA | lincRNA | 171.795 | -1.894 | 0.004 | NA | 10:75238910-75239662 | 0.985 |
| RLOC\_00027931 | NA | NA | lincRNA | 18.323 | -1.876 | 0.028 | NA | 3:2094847-2098421 | 0.744 |
| RLOC\_00011886 | NA | NA | antisense\_mRNA | 165.893 | -1.859 | 0.005 | NA | 17:32090743-32091946 | 0.994 |
| RLOC\_00029252 | NA | NA | antisense\_mRNA | 43.737 | -1.836 | 0.009 | NA | 10:97707984-97714141 | 0.945 |
| RLOC\_00015636 | NA | NA | antisense\_mRNA | 23.198 | -1.821 | 0.014 | NA | 17:51159977-51161996 | 0.998 |
| RLOC\_00007862 | NA | NA | lincRNA | 7.677 | -1.816 | 0.043 | NA | 16:30067332-30070413 | 0.976 |
| RLOC\_00035575 | NA | NA | antisense\_mRNA | 66.945 | -1.813 | 0.012 | NA | 3:141873105-141874753 | 0.745 |
| RLOC\_00009024 | NA | NA | lincRNA | 120.389 | -1.778 | 0.023 | NA | 5:146085493-146092534 | 0.938 |
| RLOC\_00034833 | NA | NA | antisense\_mRNA | 54.424 | -1.697 | 0.008 | NA | 2:202632868-202635507 | 0.763 |
| RLOC\_00000565 | NA | NA | lincRNA | 1841.412 | -1.689 | 0 | NA | X:56728711-56817942 | 0.989 |
| RLOC\_00020569 | NA | NA | antisense\_mRNA | 40.078 | -1.683 | 0.003 | NA | 11:2486220-2630113 | 0.722 |
| RLOC\_00031417 | NA | NA | antisense\_mRNA | 17.793 | -1.674 | 0.001 | NA | 7:94407813-94508796 | 0.718 |
| RLOC\_00015328 | NA | NA | lincRNA | 29.81 | -1.659 | 0.019 | NA | 14:34060843-34064454 | 0.735 |
| RLOC\_00011722 | NA | NA | antisense\_mRNA | 70.983 | -1.642 | 0.046 | NA | 9:4711865-4741093 | 0.995 |
| RLOC\_00033235 | NA | NA | antisense\_mRNA | 197.614 | -1.602 | 0.001 | NA | 5:177402625-177519663 | 0.998 |
| RLOC\_00011720 | NA | NA | antisense\_mRNA | 233.011 | -1.597 | 0.018 | LINC02079 | 17:39026607-39026941 | 0.969 |
| RLOC\_00011759 | NA | NA | lincRNA | 40.391 | -1.58 | 0.041 | NA | 17:62303605-62304895 | 0.836 |
| RLOC\_00035703 | NA | NA | lincRNA | 487.729 | -1.571 | 0 | NA | 3:153152240-153159756 | 0.729 |
| RLOC\_00022658 | NA | NA | antisense\_mRNA | 254.48 | 1.561 | 0 | NA | 11:8947662-8950777 | 0.808 |
| RLOC\_00014809 | NA | NA | lincRNA | 4.21 | 1.698 | 0.041 | AC062015.1 | 2:226184949-226186263 | 0.923 |
| RLOC\_00023934 | ENSCAFG00000003742 | NA | antisense\_mRNA | 17.149 | 1.736 | 0 | NA | 9:33026484-33038903 | 0.924 |
| RLOC\_00002398 | NA | NA | antisense\_mRNA | 86.464 | 1.782 | 0.003 | NR2F1-AS1 | 5:93409596-93584109 | 0.82 |
| RLOC\_00029966 | NA | NA | lincRNA | 20.164 | 1.801 | 0.037 | NA | 7:6273510-6277810 | 0.744 |
| RLOC\_00032616 | NA | NA | lincRNA | 67.106 | 1.868 | 0.014 | HOXD-AS2 | 2:176134485-176136721 | 0.754 |
| RLOC\_00023326 | NA | NA | antisense\_mRNA | 3.806 | 1.989 | 0.029 | RASSF8-AS1 | 12:25833963-25958356 | 0.713 |
| RLOC\_00015703 | NA | NA | lincRNA | 472.906 | 1.992 | 0.023 | NA | 14:68766615-68768450 | 0.704 |
| RLOC\_00011700 | NA | NA | antisense\_mRNA | 74.338 | 2.022 | 0 | NA | 17:73168411-73189776 | 0.81 |
| RLOC\_00032620 | NA | NA | antisense\_mRNA | 159.885 | 2.03 | 0.023 | HAGLR | 2:176175750-176177638 | 0.786 |
| RLOC\_00034734 | NA | NA | antisense\_mRNA | 408.313 | 2.084 | 0.003 | NA | 2:196716175-196728386 | 0.872 |
| RLOC\_00002175 | NA | NA | lincRNA | 46.34 | 2.112 | 0.004 | NA | 8:12393036-12393416 | 0.999 |
| RLOC\_00020381 | NA | NA | lincRNA | 86.589 | 2.188 | 0 | TRAM2-AS1 | 6:52579196-52599155 | 0.745 |
| RLOC\_00002920 | NA | NA | lincRNA | 63.512 | 2.227 | 0.016 | NA | 16:69339826-69342312 | 0.907 |
| RLOC\_00032412 | NA | NA | lincRNA | 9.23 | 2.31 | 0.02 | NA | 2:156803533-156806507 | 0.729 |
| RLOC\_00008584 | NA | NA | lincRNA | 3.453 | 2.378 | 0.032 | NA | 5:123408497-123411660 | 0.987 |
| RLOC\_00026713 | NA | NA | antisense\_mRNA | 6.2 | 2.41 | 0.046 | NA | 1:166935115-166937358 | 0.798 |
| RLOC\_00033708 | NA | NA | lincRNA | 2.1 | 2.467 | 0.037 | NA | 5:37841298-37842236 | 0.854 |
| RLOC\_00021152 | NA | NA | lincRNA | 21.889 | 2.482 | 0.013 | NA | 8:125946795-125947565 | 0.915 |
| RLOC\_00004130 | NA | NA | antisense\_mRNA | 24.493 | 2.561 | 0 | NA | 9:96417624-96417828 | 0.814 |
| RLOC\_00024964 | NA | NA | lincRNA | 10.358 | 2.627 | 0.04 | NA | 3:108036154-108037304 | 0.765 |
| RLOC\_00024264 | NA | NA | lincRNA | 936.056 | 2.634 | 0 | AC133644.3 | 2:87455277-87622920 | 0.979 |
| RLOC\_00034277 | NA | NA | antisense\_mRNA | 21.833 | 2.64 | 0.013 | NA | 1:151982914-151986253 | 0.85 |
| RLOC\_00016416 | ENSCAFG00000032478 | NA | antisense\_mRNA | 2.714 | 2.674 | 0.044 | NA | 18:70325820-70327011 | 0.801 |
| RLOC\_00004029 | NA | NA | lincRNA | 63.999 | 2.963 | 0.014 | NA | 6:121868301-121903730 | 0.992 |
| RLOC\_00034166 | NA | NA | antisense\_mRNA | 15.563 | 2.966 | 0.001 | NA | 4:107913565-107917791 | 0.994 |
| RLOC\_00028392 | NA | NA | lincRNA | 30.578 | 3 | 0.001 | NA | 19:18800557-18801451 | 0.706 |
| RLOC\_00015479 | NA | NA | lincRNA | 43.107 | 3.123 | 0.001 | NA | 14:50839525-50858164 | 0.799 |
| RLOC\_00015048 | NA | NA | antisense\_mRNA | 3.613 | 3.21 | 0.025 | NA | 2:240591845-240592157 | 0.821 |
| RLOC\_00014117 | NA | NA | lincRNA | 29.158 | 3.239 | 0.003 | NA | 2:58518658-58547029 | 0.737 |
| RLOC\_00029138 | NA | NA | lincRNA | 9.138 | 3.239 | 0.015 | NA | 10:90683230-90684489 | 0.71 |
| RLOC\_00031589 | NA | NA | lincRNA | 3.396 | 3.24 | 0.008 | NA | 7:25387592-25397227 | 0.781 |
| RLOC\_00021953 | NA | NA | lincRNA | 73.58 | 3.359 | 0 | CASC15 | 6:21666398-21885801 | 0.942 |
| RLOC\_00012494 | NA | NA | lincRNA | 16.122 | 3.553 | 0.004 | NA | 17:33294457-33316319 | 0.875 |
| RLOC\_00026556 | NA | NA | lincRNA | 7.631 | 3.663 | 0.003 | NA | 6:117999273-117999586 | 0.756 |
| RLOC\_00011077 | NA | NA | lincRNA | 2.595 | 3.673 | 0.023 | LINC01301 | 8:60403489-60405252 | 0.78 |
| RLOC\_00008433 | ENSCAFG00000028700,ENSCAFG00000029122 | ZEB2\_AS1\_4,ZEB2\_AS1\_3 | lincRNA | 21.793 | 3.796 | 0 | ZEB2-AS1 | 2:144520485-144522161 | 0.839 |
| RLOC\_00013073 | NA | NA | lincRNA | 18.168 | 3.797 | 0.015 | AC006450.3 | 9:124007555-124011599 | 0.746 |
| RLOC\_00035720 | NA | NA | lincRNA | 63.572 | 3.87 | 0.003 | NA | 6:103205226-103205781 | 1 |
| RLOC\_00024794 | ENSCAFG00000030382 | NA | lincRNA | 113.264 | 3.936 | 0 | NA | 1:111726510-111727221 | 0.713 |
| RLOC\_00016582 | NA | NA | antisense\_mRNA | 68.65 | 4.185 | 0 | NA | 15:48296762-48299154 | 0.753 |
| RLOC\_00009057 | NA | NA | antisense\_mRNA | 4.25 | 4.289 | 0.001 | NA | 5:55218929-55223040 | 0.752 |
| RLOC\_00034218 | NA | NA | antisense\_mRNA | 4.48 | 4.36 | 0.008 | NA | 4:112508644-112519940 | 0.743 |
| RLOC\_00018365 | NA | NA | lincRNA | 253.057 | 4.403 | 0 | AC090692.1 | 11:35912935-35915548 | 0.755 |
| RLOC\_00001229 | NA | NA | antisense\_mRNA | 12.982 | 4.513 | 0.005 | NA | X:140503528-140506836 | 0.75 |
| RLOC\_00008492 | NA | NA | antisense\_mRNA | 63.181 | 4.861 | 0 | NA | 2:151671008-151675686 | 0.75 |
| RLOC\_00005892 | NA | NA | antisense\_mRNA | 5.396 | 4.883 | 0.001 | NA | 2:9584266-9630510 | 0.796 |
| RLOC\_00022953 | NA | NA | antisense\_mRNA | 6.571 | 4.91 | 0.01 | HOXC-AS3 | 12:53981706-53984833 | 0.757 |
| RLOC\_00002254 | NA | NA | antisense\_mRNA | 22.293 | 4.958 | 0.007 | STARD4-AS1 | 5:111730123-111731168 | 0.903 |
| RLOC\_00025419 | NA | NA | lincRNA | 6.199 | 5.758 | 0.041 | SNAP25-AS1 | 20:10060634-10219509 | 0.987 |
| RLOC\_00016732 | NA | NA | lincRNA | 78.15 | 5.923 | 0 | NA | 15:60843611-60847670 | 0.735 |

**Supplementary Table 4.** Number of lncRNAs per WGCNA modules.

|  |  |
| --- | --- |
| lncRNA | Module\_color\_assignment |
| 24 | antiquewhite4 |
| 10 | bisque4 |
| 529 | brown |
| 50 | brown4 |
| 22 | coral1 |
| 22 | coral2 |
| 154 | cyan |
| 124 | darkgreen |
| 136 | darkgrey |
| 100 | darkmagenta |
| 29 | darkolivegreen |
| 134 | darkorange |
| 37 | darkorange2 |
| 147 | darkred |
| 85 | darkseagreen4 |
| 66 | darkslateblue |
| 234 | darkturquoise |
| 337 | green |
| 219 | greenyellow |
| 162 | grey60 |
| 268 | honeydew1 |
| 40 | ivory |
| 47 | lavenderblush3 |
| 172 | lightcyan |
| 153 | lightgreen |
| 39 | lightpink4 |
| 17 | lightsteelblue |
| 48 | lightsteelblue1 |
| 297 | magenta |
| 27 | maroon |
| 18 | mediumorchid |
| 85 | mediumpurple3 |
| 222 | midnightblue |
| 43 | navajowhite2 |
| 627 | orange |
| 16 | orangered3 |
| 77 | orangered4 |
| 93 | paleturquoise |
| 45 | palevioletred3 |
| 147 | pink |
| 57 | plum2 |
| 318 | purple |
| 287 | red |
| 180 | royalblue |
| 73 | saddlebrown |
| 34 | salmon4 |
| 75 | sienna3 |
| 87 | skyblue |
| 15 | skyblue1 |
| 19 | skyblue2 |
| 32 | skyblue3 |
| 41 | steelblue |
| 408 | tan |
| 28 | thistle1 |
| 65 | thistle2 |
| 152 | white |
| 97 | yellow |
| 25 | yellow4 |
| 71 | yellowgreen |

**Supplementary Table 5.** Breed-specific DE lncRNAs. LncRNAs in poodles (PODL) are also found in WGCNA poodle modules.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Id | Biotype | Normalized mean counts | lFC | p.adj | breed |
| RLOC\_00026622 | antisense\_mRNA | 22.311 | -3.392 | 0.000 | PODL |
| RLOC\_00030862 | lincRNA | 10.636 | -2.800 | 0.004 | PODL |
| RLOC\_00027767 | lincRNA | 8.954 | 1.502 | 0.008 | PODL |
| RLOC\_00023881 | antisense\_mRNA | 94.765 | 1.567 | 0.010 | PODL |
| RLOC\_00020800 | antisense\_mRNA | 33.681 | 1.835 | 0.027 | PODL |
| RLOC\_00012324 | lincRNA | 12.754 | 1.904 | 0.005 | PODL |
| RLOC\_00012791 | antisense\_mRNA | 23.892 | 1.922 | 0.001 | PODL |
| RLOC\_00017181 | antisense\_mRNA | 5.893 | 1.947 | 0.033 | PODL |
| RLOC\_00007411 | antisense\_mRNA | 13.398 | 1.959 | 0.002 | PODL |
| RLOC\_00021127 | antisense\_mRNA | 39.942 | 1.960 | 0.003 | PODL |
| RLOC\_00034770 | antisense\_mRNA | 66.448 | 2.570 | 0.000 | PODL |
| RLOC\_00009497 | lincRNA | 6.248 | -3.356 | 0.030 | GRET |
| RLOC\_00014840 | antisense\_mRNA | 5.784 | -3.263 | 0.019 | GRET |
| RLOC\_00028757 | antisense\_mRNA | 5.839 | -2.365 | 0.007 | GRET |
| RLOC\_00007259 | lincRNA | 123.353 | 2.502 | 0.001 | GRET |
| RLOC\_00036011 | lincRNA | 5.198 | 3.100 | 0.037 | GRET |
| RLOC\_00026641 | lincRNA | 5.099 | 4.672 | 0.021 | GRET |
| RLOC\_00019703 | lincRNA | 6.052 | 5.082 | 0.045 | GRET |