

**Supplemental Table 2: Nanostring Canine IO Panel  
(115000465: Canine IO CSO+PS, XT-CSPS-CIO-12; 100052: Master Kit, NAA-AKIT-012)**

Gene	Canine IO	
ABCB1	+	
ABCF1	+	
ABL1	+	
ACOD1	+	
ACVR1	+	
ADA	+	
ADAMTS2	+	
ADGRE5	+	
ADORA2A	+	
ADORA3	+	
AICDA	+	
AIRE	+	
AKT1	+	
AKT3	+	
ALCAM	+	
AMBP	+	
ANKRD22	+	
ANXA1	+	
APC	+	
APOE	+	
APP	+	
AR	+	
ARG1	+	
ARG2	+	
ATF1	+	
ATF2	+	
ATG10	+	
ATG12	+	
ATG16L1	+	
ATG5	+	
ATG7	+	
ATM	+	
ATRX	+	
AXL	+	
B2M	+	
BATF	+	
BAX	+	
BCL10	+	
BCL2	+	
BCL2L1	+	
BCL6	+	
BCR	+	
BHLHE40	+	
BID	+	

BIRC5	+	
BLK	+	
BLNK	+	
BMI1	+	
BRAF	+	
BRCA1	+	
BRCA2	+	
BST1	+	
BST2	+	
BTK	+	
BTLA	+	
C1QA	+	
C1QB	+	
C1QBP	+	
C1R	+	
C1S	+	
C2	+	
C3	+	
C3AR1	+	
C4BPA	+	
C5	+	
C6	+	
C7	+	
C8A	+	
C8B	+	
C8G	+	
C9	+	
CALHM6	+	
CAMP	+	
CARD11	+	
CARD9	+	
CASP10	+	
CASP3	+	
CASP8	+	
CCL1	+	
CCL13	+	
CCL14	+	
CCL16	+	
CCL17	+	
CCL19	+	
CCL2	+	
CCL20	+	
CCL21	+	
CCL22	+	
CCL23	+	
CCL24	+	

CCL25	+	
CCL26	+	
CCL27	+	
CCL28	+	
CCL3	+	
CCL4	+	
CCL5	+	
CCL7	+	
CCL8	+	
CCND1	+	
CCND2	+	
CCND3	+	
CCR1	+	
CCR10	+	
CCR2	+	
CCR3	+	
CCR4	+	
CCR5	+	
CCR6	+	
CCR7	+	
CCR9	+	
CCRL2	+	
CD14	+	
CD160	+	
CD163	+	
CD164	+	
CD180	+	
CD19	+	
CD1A6	+	
CD1B	+	
CD1C	+	
CD1D	+	
CD1E	+	
CD2	+	
CD200	+	
CD207	+	
CD209	+	
CD22	+	
CD244	+	
CD247	+	
CD27	+	
CD274	+	
CD276	+	
CD28	+	
CD34	+	
CD36	+	

CD37	+	
CD38	+	
CD3D	+	
CD3E	+	
CD3EAP	+	
CD3G	+	
CD4	+	
CD40	+	
CD40LG	+	
CD44	+	
CD47	+	
CD48	+	
CD5	+	
CD53	+	
CD55	+	
CD58	+	
CD59	+	
CD6	+	
CD63	+	
CD68	+	
CD7	+	
CD70	+	
CD74	+	
CD79A	+	
CD79B	+	
CD80	+	
CD81	+	
CD83	+	
CD84	+	
CD86	+	
CD8A	+	
CD8B	+	
CD9	+	
CD96	+	
CD99	+	
CDH1	+	
CDH5	+	
CDK1	+	
CDK4	+	
CDKN1A	+	
CDKN2A	+	
CDKN2B	+	
CDKN2C	+	
CEACAM1	+	
CEBPA	+	
CEBPB	+	

CFB	+	
CFD	+	
CFI	+	
CFP	+	
CH25H	+	
CHEK2	+	
CHUK	+	
CIITA	+	
CISH	+	
CKLF	+	
CLDN1	+	
CLEC4A	+	
CLEC5A	+	
CLEC7A	+	
CLU	+	
CMA1	+	
CMKLR1	+	
CNP	+	
COL1A1	+	
COL3A1	+	
COLEC12	+	
CPA3	+	
CR1L	+	
CR2	+	
CREB1	+	
CREB5	+	
CREBBP	+	
CRP	+	
CSF1	+	
CSF1R	+	
CSF2	+	
CSF2RB	+	
CSF3	+	
CSF3R	+	
CTLA4	+	
CTSG	+	
CTSH	+	
CTSS	+	
CTSW	+	
CX3CL1	+	
CX3CR1	+	
CXCL10	+	
CXCL11	+	
CXCL12	+	
CXCL13	+	

CXCL14	+	
CXCL16	+	
CXCL8	+	
CXCR1	+	
CXCR2	+	
CXCR3	+	
CXCR4	+	
CXCR5	+	
CXCR6	+	
CYBB	+	
CYFIP2	+	
CYLD	+	
DDR1	+	
DDX5	+	
DDX58	+	
DEFB1	+	
DLA-12	+	
DLA-64	+	
DLA-79	+	
DLA-DMA	+	
DLA-DMB	+	
DLA-DOB	+	
DLA-DQA1	+	
DLA-DQB1	+	
DLA-DRA	+	
DLA88	+	
DMBT1	+	
DNAJC14	+	
DNMT3A	+	
DOCK2	+	
DOK1	+	
DOK2	+	
DUSP1	+	
DUSP6	+	
EBI3	+	
EGFR	+	
EGR1	+	
ELANE	+	
ENTPD1	+	
EOMES	+	
EP300	+	
EPCAM	+	
EPHA5	+	

EPSTI1	+	
ERBB2	+	
ERBB3	+	
ERBB4	+	
ERCC3	+	
ESR1	+	
ESR2	+	
ETS1	+	
F13A1	+	
FABP7	+	
FADD	+	
FAS	+	
FASLG	+	
FAT1	+	
FBXW11	+	
FCAR	+	
FCER1A	+	
FCER1G	+	
FCER2	+	
FCGR1A	+	
FCRL2	+	
FGFR1	+	
FGFR3	+	
FLT3	+	
FLT3LG	+	
FN1	+	
FOS	+	
FOXA1	+	
FOXP3	+	
FPR2	+	
FYN	+	
G6PD	+	
GATA3	+	
GBP5	+	
GFAP	+	
GH1	+	
GPI	+	
GSK3A	+	
GSK3B	+	
GUSB	+	
GZMA	+	
GZMB	+	
GZMH	+	

GZMK	+	
HAMP	+	
HAVCR2	+	
HBEGF	+	
HCK	+	
HCST	+	
HDC	+	
HIF1A	+	
HLA-DRB1	+	
HMGB1	+	
HMGCR	+	
HNF1A	+	
HRAS	+	
HSD11B1	+	
ICAM1	+	
ICAM2	+	
ICAM3	+	
ICAM4	+	
ICOS	+	
ICOSLG	+	
IDH1	+	
IDH2	+	
IDO1	+	
IDO2	+	
IFGGC1	+	
IFI35	+	
IFIH1	+	
IFIT2	+	
IFNA7	+	
IFNAR1	+	
IFNAR2	+	
IFNB1	+	
IFNG	+	
IFNGR1	+	
IGF1R	+	
IGF2R	+	
IGHG	+	
IGHM	+	
IKBKB	+	
IKBKE	+	
IKBKG	+	
IL10	+	
IL10RA	+	
IL11	+	
IL11RA	+	
IL12A	+	

IL12B	+	
IL12RB1	+	
IL12RB2	+	
IL13	+	
IL13RA1	+	
IL13RA2	+	
IL15	+	
IL15RA	+	
IL16	+	
IL17A	+	
IL17B	+	
IL17F	+	
IL17RA	+	
IL17RB	+	
IL18	+	
IL18R1	+	
IL18RAP	+	
IL19	+	
IL1A	+	
IL1B	+	
IL1R1	+	
IL1R2	+	
IL1RAP	+	
IL1RL1	+	
IL1RL2	+	
IL1RN	+	
IL2	+	
IL21	+	
IL21R	+	
IL22	+	
IL22RA1	+	
IL22RA2	+	
IL23A	+	
IL23R	+	
IL24	+	
IL25	+	
IL26	+	
IL27	+	
IL29L	+	
IL2RA	+	
IL2RB	+	
IL2RG	+	
IL3	+	
IL31RA	+	
IL32	+	
IL34	+	

IL3RA	+	
IL4	+	
IL4R	+	
IL5	+	
IL5RA	+	
IL6	+	
IL6R	+	
IL6ST	+	
IL7	+	
IL7R	+	
IL9	+	
ILF3	+	
INPPL1	+	
IRAK1	+	
IRAK2	+	
IRAK4	+	
IRF1	+	
IRF2	+	
IRF3	+	
IRF4	+	
IRF5	+	
IRF8	+	
ISG15	+	
ISG20	+	
ITGA1	+	
ITGA2	+	
ITGA2B	+	
ITGA4	+	
ITGA5	+	
ITGA6	+	
ITGAE	+	
ITGAL	+	
ITGAM	+	
ITGAV	+	
ITGAX	+	
ITGB1	+	
ITGB2	+	
ITGB3	+	
ITGB4	+	
ITK	+	
JAK1	+	
JAK2	+	
JAK3	+	
JAM3	+	
JAML	+	

KDM5C	+	
KDR	+	
KIT	+	
KLRA1	+	
KLRB1	+	
KLRD1	+	
KLRF1	+	
KLRG1	+	
KLRK1	+	
KMT2A	+	
KMT2D	+	
KRT14	+	
KRT18	+	
KRT7	+	
KRT8	+	
LAG3	+	
LAIR1	+	
LAMP1	+	
LAMP2	+	
LAP3	+	
LBP	+	
LCK	+	
LCN2	+	
LCP1	+	
LFNG	+	
LGALS1	+	
LGALS3	+	
LIF	+	
LOC100049	+	
LOC100683	+	
LOC100683	+	
LOC100686	+	
LOC100856	+	
LOC102153	+	
LOC102154	+	
LOC102155	+	
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LOC106557	+	
LOC111094	+	
LOC475935	+	
LOC476396	+	

LOC476900	+	
LOC477699	+	
LOC478984	+	
LOC480600	+	
LOC481722	+	
LOC483397	+	
LOC484306	+	
LOC484343	+	
LOC487977	+	
LOC488947	+	
LOC490356	+	
LOC606890	+	
LOC609023	+	
LOC612539	+	
LRP1	+	
LTA	+	
LTB	+	
LTBR	+	
LTF	+	
LTK	+	
LY86	+	
LY9	+	
LY96	+	
LYN	+	
MAF	+	
MAP2	+	
MAP2K1	+	
MAP2K2	+	
MAP2K4	+	
MAP3K1	+	
MAP3K5	+	
MAP3K7	+	
MAP4K2	+	
MAPK1	+	
MAPK11	+	
MAPK14	+	
MAPK3	+	
MAPK8	+	
MAPKAPK2	+	
MARCO	+	
MASP1	+	
MASP2	+	
MAVS	+	
MBL2	+	
MCAM	+	
MDM4	+	

MEF2C	+	
MEFV	+	
MERTK	+	
MET	+	
MGMT	+	
MIF	+	
MKI67	+	
MME	+	
MMP1	+	
MMP9	+	
MR1	+	
MRC1	+	
MRPL19	+	
MS4A1	+	
MS4A2	+	
MSR1	+	
MST1R	+	
MTOR	+	
MUC1	+	
MX1	+	
MYC	+	
MYD88	+	
NCAM1	+	
NCF4	+	
NCR1	+	
NCR3	+	
NDRG1	+	
NF1	+	
NFATC1	+	
NFATC2	+	
NFATC3	+	
NFATC4	+	
NFKB1	+	
NFKB2	+	
NFKBIA	+	
NINJ2	+	
NKG7	+	
NLRC5	+	
NLRP3	+	
NOD1	+	
NOD2	+	
NOS2	+	
NOTCH1	+	
NPNT	+	
NR1H3	+	

NRAS	+	
NRDE2	+	
NRP1	+	
NT5E	+	
NTRK1	+	
NUP62	+	
OAS2	+	
OAS3	+	
OAZ1	+	
OLIG2	+	
OSM	+	
PALB2	+	
PARP1	+	
PAX5	+	
PCNA	+	
PDCD1	+	
PDCD1LG2	+	
PDGFC	+	
PDGFRA	+	
PDGFRB	+	
PDPN	+	
PECAM1	+	
PGR	+	
PIK3C2B	+	
PIK3C2G	+	
PIK3CA	+	
PIK3CD	+	
PIK3CG	+	
PIK3R1	+	
PIN1	+	
PIP	+	
PLA2G1B	+	
PLAU	+	
PLAUR	+	
PLCG1	+	
PNMA1	+	
PNOC	+	
POLR2A	+	
POU2AF1	+	
POU2F2	+	
PPARG	+	
PPARGC1A	+	
PPBP	+	

PRDM1	+	
PRF1	+	
PRKCD	+	
PRKCE	+	
PSMB10	+	
PSMB8	+	
PSMB9	+	
PSMC4	+	
PTEN	+	
PTGDR2	+	
PTGER2	+	
PTGER4	+	
PTGS2	+	
PTHLH	+	
PTK2	+	
PTPRC	+	
PUM1	+	
PVR	+	
PYCARD	+	
RAD51	+	
RAF1	+	
RAG2	+	
RB1	+	
REL	+	
RELA	+	
RELB	+	
RET	+	
RIPK2	+	
RORA	+	
RORC	+	
RPS6	+	
RUNX1	+	
S100A10	+	
S100A12	+	
S100A4	+	
S100A8	+	
S100A9	+	
S100B	+	
SAA1	+	
SDC4	+	
SDHA	+	
SELE	+	
SELL	+	
SELPLG	+	
SERPINB2	+	

SERPING1	+	
SETD2	+	
SF3A1	+	
SH2D1A	+	
SHMT2	+	
SIGIRR	+	
SIGLEC1	+	
SLAMF1	+	
SLAMF6	+	
SLAMF7	+	
SLC11A1	+	
SLC16A1	+	
SLC16A3	+	
SMAD2	+	
SMAD3	+	
SMARCA4	+	
SOCS1	+	
SOX10	+	
SPIB	+	
SPP1	+	
SPRY2	+	
SRC	+	
ST6GAL1	+	
STAT1	+	
STAT2	+	
STAT3	+	
STAT4	+	
STAT5A	+	
STAT5B	+	
STAT6	+	
STK11	+	
STK11IP	+	
SYK	+	
TAL1	+	
TANK	+	
TAP1	+	
TAPBP	+	
TBC1D10B	+	
TBK1	+	
TBP	+	
TBX21	+	
TCF7	+	
TERT	+	

TFE3	+	
TFEB	+	
TFRC	+	
TGFB1	+	
TGFB2	+	
THBD	+	
THBS1	+	
THY1	+	
TICAM1	+	
TICAM2	+	
TIGIT	+	
TIRAP	+	
TLK2	+	
TLR1	+	
TLR10	+	
TLR2	+	
TLR3	+	
TLR4	+	
TLR5	+	
TLR6	+	
TLR7	+	
TLR8	+	
TLR9	+	
TMUB2	+	
TNF	+	
TNFAIP3	+	
TNFRSF11A	+	
TNFRSF11B	+	
TNFRSF12A	+	
TNFRSF13B	+	
TNFRSF13C	+	
TNFRSF14	+	
TNFRSF17	+	
TNFRSF18	+	
TNFRSF1A	+	
TNFRSF1B	+	
TNFRSF4	+	
TNFRSF8	+	
TNFRSF9	+	
TNFSF10	+	
TNFSF11	+	
TNFSF12	+	
TNFSF13	+	
TNFSF13B	+	
TNFSF14	+	
TNFSF15	+	

## Text

TNFSF18	+	
TNFSF4	+	
TNFSF8	+	
TNKS	+	
TNKS2	+	
TOLLIP	+	
TOX	+	
TP53	+	
TP63	+	
TRAC	+	
TRAF1	+	
TRAF2	+	
TRAF3	+	
TRAF6	+	
TRAT1	+	
TRBC	+	
TREM1	+	
TREM2	+	
TRGC2	+	
TRGC3	+	
TRGC8	+	
TRIB1	+	
TSC2	+	
TUBB3	+	
TXK	+	
TXNIP	+	
TYK2	+	
TYMS	+	
TYROBP	+	
UBB	+	
VCAM1	+	
VEGFA	+	
VEGFC	+	
VIM	+	
VSIR	+	
XCR1	+	
ZAP70	+	
ZEB1	+	

The Canine IO panel was developed specifically for use with paraffin-embedded canine tumor tissue from canine cancer patients through a collaboration among members of the PRE-medical Cancer Immunotherapy Network for Canine Trials (PRECINCT) and Nanostring Technologies and supported by a grant from the National Cancer Institute (U24-CA224122 SUPPLEMENT; PI: Nicola Mason). Genes known to be associated with intracranial gliomas in both pet dogs and humans were selected based on their relevance for the study of oncology as well as expression profiles from both RNA-Seq and nCounter experiments.