ORCA – Online Research @ Cardiff

A. LAN5

B. Displacement (um)

C. TrkB/BDNF Expression
- trkB
- BDNF

LAN5   SHSY5Y   NB1643

D. Chick embryo transplant model
1. hanging drop
2. transplant/egg-reincubation
3. imaging
4a. scoring cell positions invivo
4b. scoring cells in cryosections

NT   DL   UDL   NTL   DRG   LDL   VR   N   SG   DA

E. Transplants — LAN5
Neural Crest LAN5
Rostral Somite / Caudal Somite / Rostral Somite

F. Cell count vs distance migrated (um)

G. Percent migrated
rostral   caudal
somite   *

H.
- 48hr
- 72hr
- 96hr
NTL   NT   UDL   LDL   DRG   EC   VR   SG

I. SHSY5Y
Neural Crest SHSY5Y
Rostral Somite / Caudal Somite / Rostral Somite

J.

K. rostral   caudal   somite   ***

L.
NTL   NT   UDL   LDL   DRG   EC   VR   SG

M. NB 1643
Neural Crest NB-1643
Rostral Somite / Caudal Somite / Rostral Somite

N.

O. rostral   caudal   somite   **

P.
NTL   NT   UDL   DRG

A — LAN5 trkB shRNA

rostral   nt

s

caudal

B — rostral / caudal

C — Number of invading cells (per embryo)

LAN5

200
160
120
80
40
0

WT   shTrkB

D — SHSY5Y trkB shRNA

rostral   nt

s

caudal

E — rostral / caudal

F

SHSY5Y

120
80
40
0

WT   shTrkB

G — NB1643 FL-trkB

H — rostral / caudal

I

60
40
20
0

NB1643

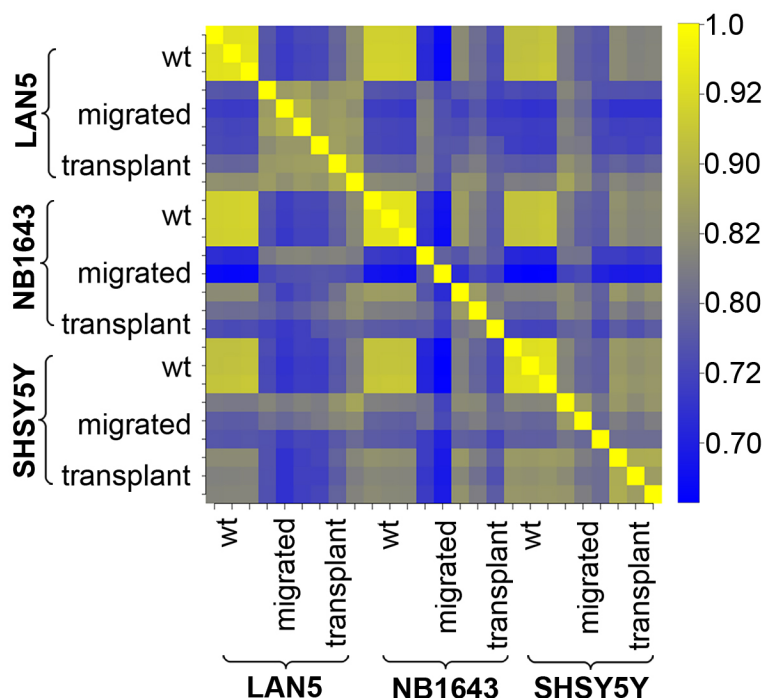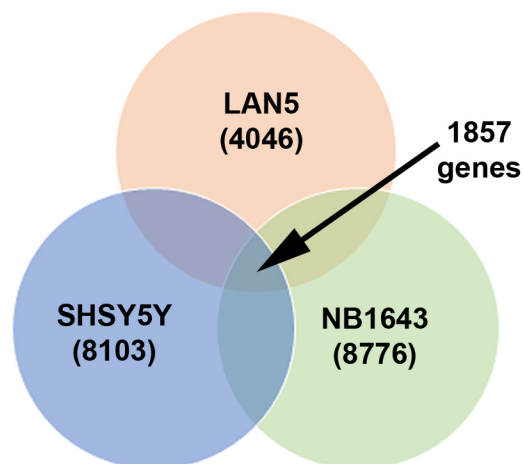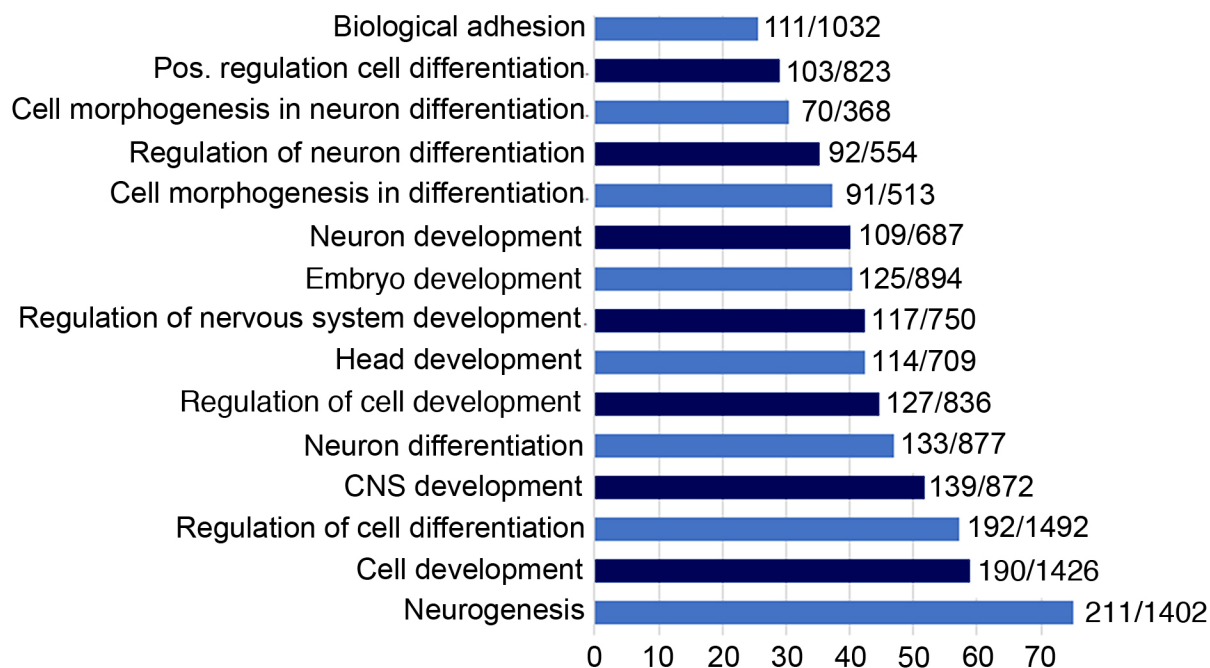WT   FLTrkB

HNK1/DAPI/GFP   GFP

A Gene expression correlation matrix
(after embryo transplantation)
In ovo (migrated vs non-migrated) vs wildtype

B Changes in the number of genes
after embryonic exposure

1857 genes

LAN5
(4046)

SHSY5Y
(8103)

NB1643
(8776)

C Go Term Enrichment of neuroblastoma cells **after embryonic exposure**
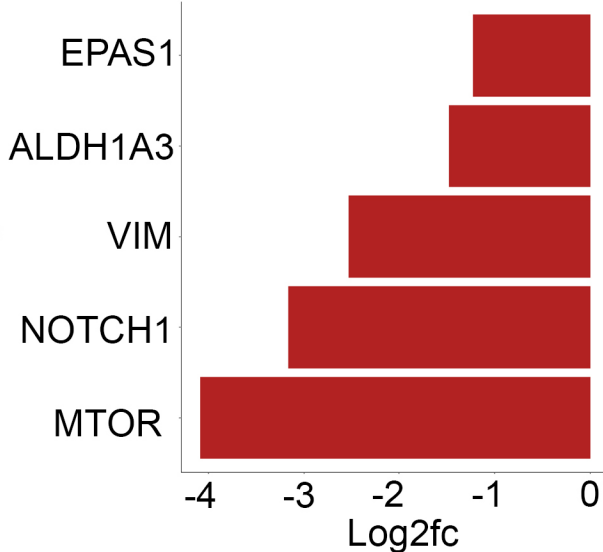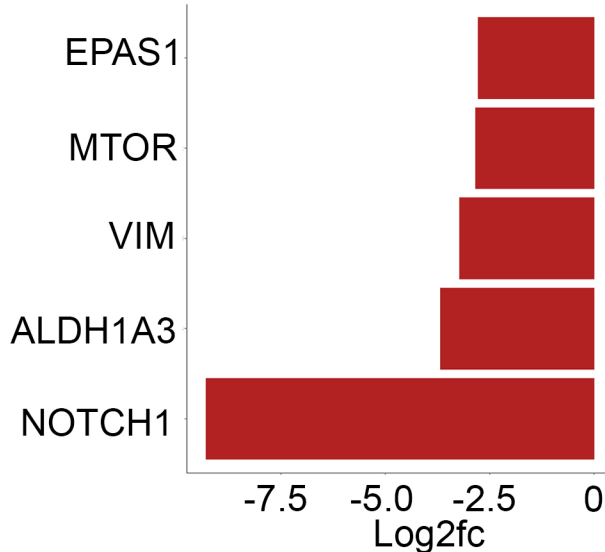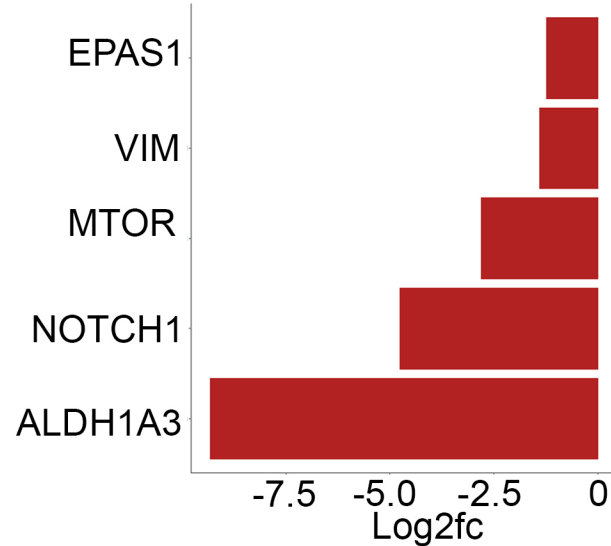
GO Term	Ratio
Biological adhesion	111/1032
Pos. regulation cell differentiation	103/823
Cell morphogenesis in neuron differentiation	70/368
Regulation of neuron differentiation	92/554
Cell morphogenesis in differentiation	91/513
Neuron development	109/687
Embryo development	125/894
Regulation of nervous system development	117/750
Head development	114/709
Regulation of cell development	127/836
Neuron differentiation	133/877
CNS development	139/872
Regulation of cell differentiation	192/1492
Cell development	190/1426
Neurogenesis	211/1402

A   Gene expression correlation matrix
     (after embryo transplantation)
     In ovo (migrated vs non-migrated) vs wildtype

B   Changes in the number of genes after embryonic exposure

Transplanted (non-invasive)

LAN5
6370
SHSY5Y 1897
749
4172
328
NB1643 8740
749

Transplanted (invasive)

LAN5
817
SHSY5Y 3372
313
436
1677
NB1643 1738
3414
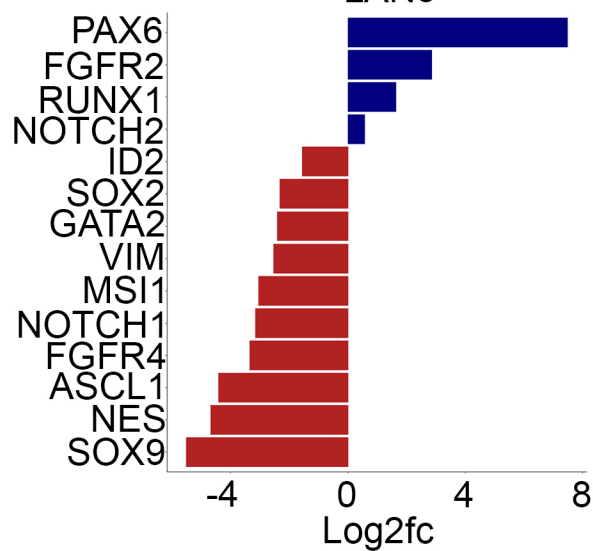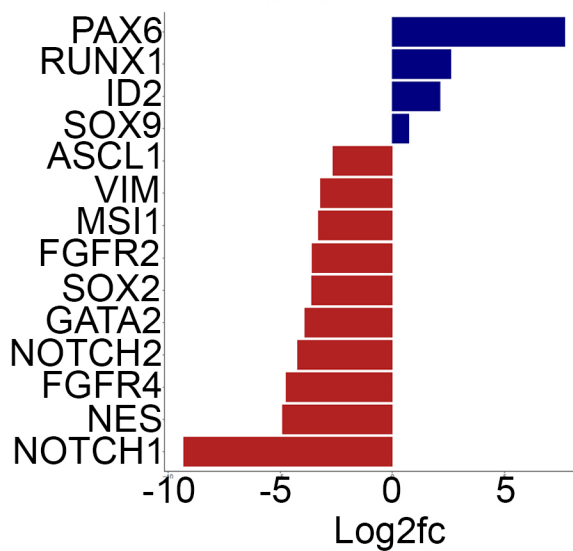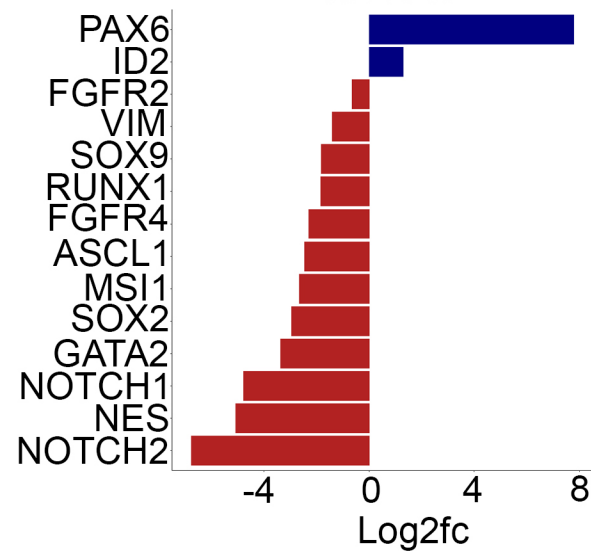
C   Go Term Fold Enrichment (328 genes)

regulation of multicellular organismal development
negative regulation of multicellular organismal process
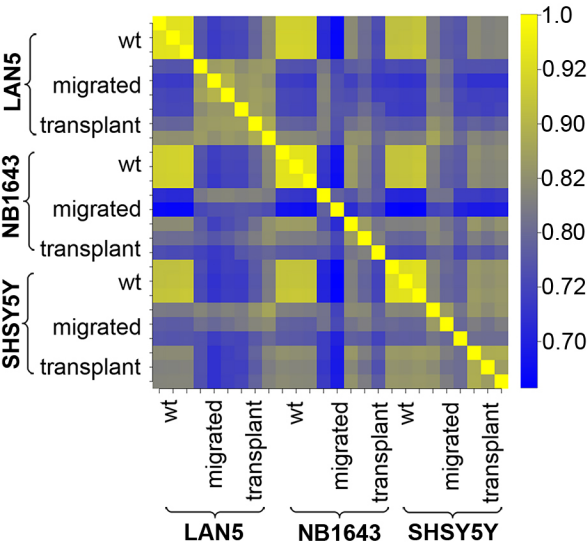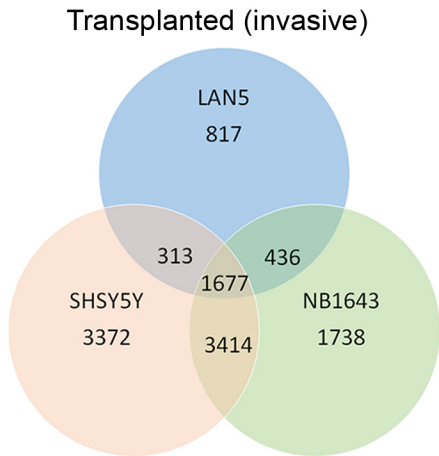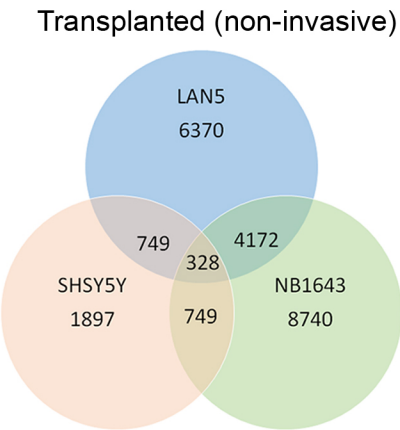biological adhesion
cell adhesion
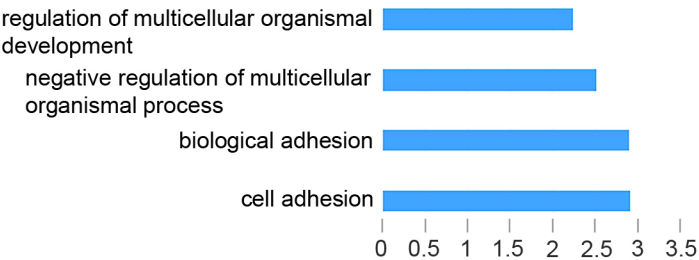
D   Go Term Fold Enrichment (1677 genes)

neurogenesis

positive regulation of neurogenesis

cell morphogenesis involved in neuron differentiation

regulation of neuron differentiation

neuron projection guidance

regulation of neuron projection development

regulation of cell morphogenesis (differentiation)

positive regulation of cell morphogenesis (differentiation)

E   Go Term Alignment

Migrated
Transplant
Random

Proliferation Differentiation Adhesion Locomotion Motility Growth

A Model Input (Gene expression ON/OFF)

LAN5

	MDK	Alk	BDNF	trkA	trkB	NGF
WT						■
Transplant						
Migrated		■		■		■

SHSY5Y

	MDK	Alk	BDNF	trkA	trkB	NGF
WT			■			
Transplant		■		■	■	
Migrated					■	

NB-1643

	MDK	Alk	BDNF	trkA	trkB	NGF
WT					■	■
Transplant		■		■	■	■
Migrated		■		■	■	■

B Model Output (Cell State ON/OFF)

LAN5

	Diff	Apop	Angio	Prolif
Ss45				
Ss21				
Ss25	■	■		

SHSY5Y

	Diff	Apop	Angio	Prolif
Ss38		■		■
Ss28		■	■	■
Ss44		■		

NB-1643

	Diff	Apop	Angio	Prolif
Ss45				
Ss25		■	■	■
Ss25		■	■	■

C Predicted Outcome

LAN5

Intermediate
Intermediate
Poor

SHSY5Y

Intermediate
Good
Poor

NB-1643

Intermediate
Good
Good