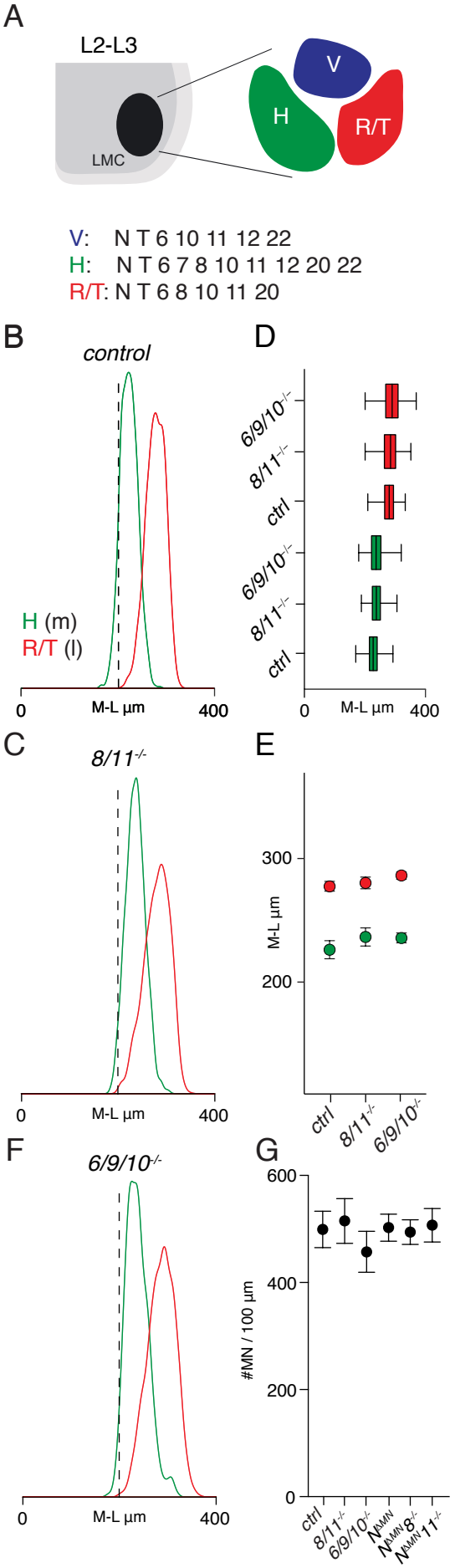

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Figure S1. Medio-lateral pool organization is preserved after elimination of type II cadherins specificity group.

(A) Schematic showing classical cadherins expression by motor pools at lumbar levels 2-3.

(B and C) Medio-lateral density plots of H (green, medial) and R/T (red, lateral) neurons in control (B) and *8/11*$^{-/-}$ (C) embryos.

(D) Box-plots of medio-lateral distributions of H (green, medial) and R/T (red, lateral) neurons in control, *8/11*$^{-/-}$ and *6/9/10*$^{-/-}$ embryos.

(E) Average medio-lateral position of H (green, medial) and R/T (red, lateral) neurons in control, *8/11*$^{-/-}$ and *6/9/10*$^{-/-}$ embryos (mean ± SD; differences not significant for H neurons: control vs. *8/11*$^{-/-}$ p=0.250; control vs. *6/9/10*$^{-/-}$ p=0.176; *8/11*$^{-/-}$ vs. *6/9/10*$^{-/-}$ p=0.997; for R/T neurons: control vs. *8/11*$^{-/-}$ p=0.998; control vs. *6/9/10*$^{-/-}$ p=0.05; *8/11*$^{-/-}$ vs. *6/9/10*$^{-/-}$ p=0.077; one-way ANOVA and post hoc Tukey's HSD test).

(F) Medio-lateral density plot of H (green, medial) and R/T (red, lateral) neurons in *6/9/10*$^{-/-}$ embryos.

(G) Average number of motor neurons in e13.5 lumbar spinal cords of control, *8/11*$^{-/-}$, *6/9/10*$^{-/-}$, $N^{\Delta MN}$, $N^{\Delta MN}8^{-/-}$, $N^{\Delta MN}11^{-/-}$ and $\beta\gamma^{\Delta MN}$ embryos (motor neurons/100µm, mean ± SD; all differences between genotypes not significant p>0.05; one-way ANOVA and post hoc Tukey's HSD test).

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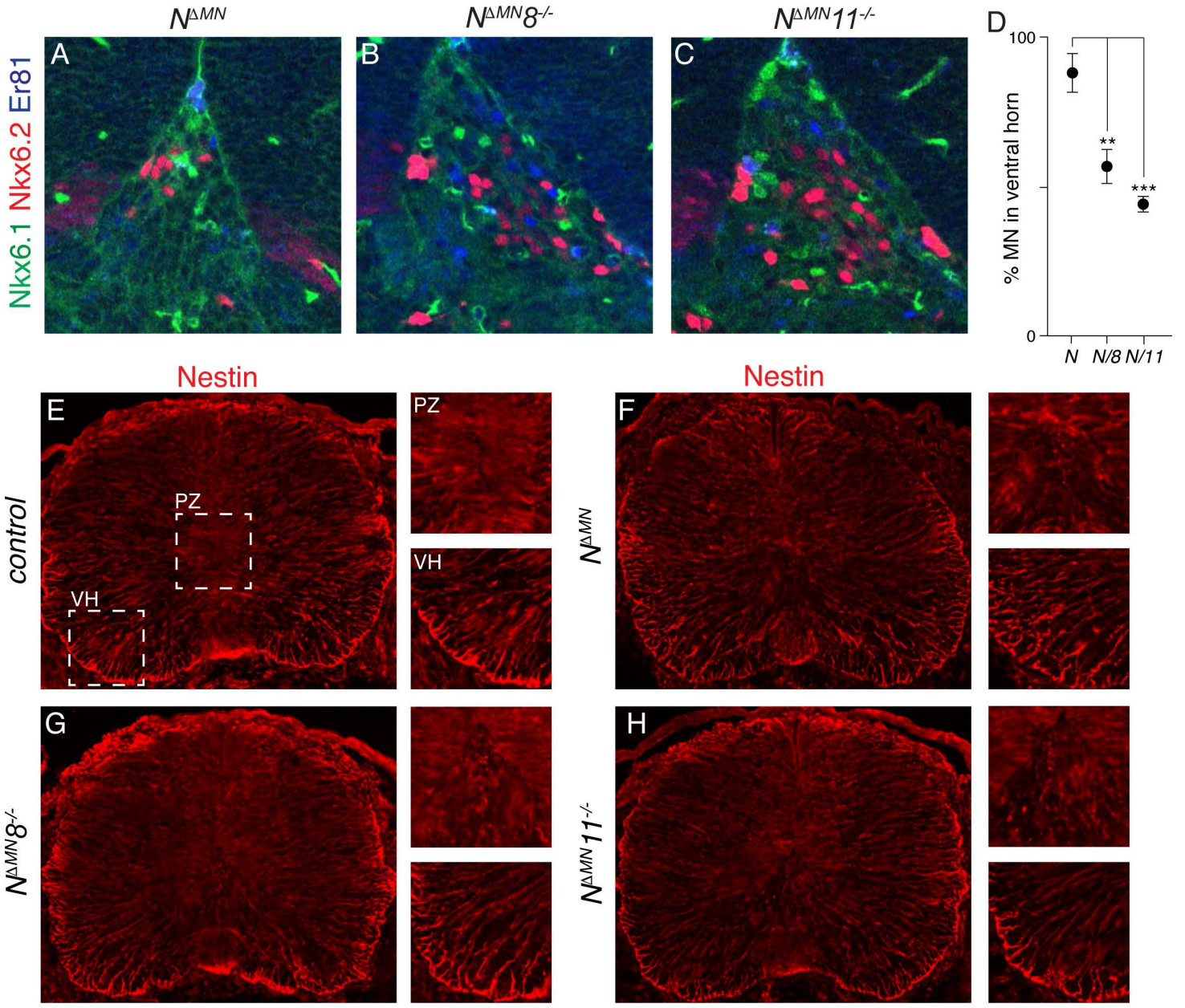

Figure S2. Motor neuron migration arrest at the progenitor zone after joint elimination of N-cadherin and a type II cadherin.

(A-C) Motor neurons at the progenitor zone in $N^{\Delta MN}$ (A), $N^{\Delta MN}8^{-/-}$ (B) and $N^{\Delta MN}11^{-/-}$ (C) e13.5 embryos.

(D) Number of motor neurons found in the ventral horn expressed as percentage of total number in $N^{\Delta MN}$, $N^{\Delta MN}8^{-/-}$ and $N^{\Delta MN}11^{-/-}$ embryos (mean ± SD; $N^{\Delta MN}$ vs. $N^{\Delta MN}8^{-/-}$ **p<0.01; $N^{\Delta MN}$ vs. $N^{\Delta MN}11^{-/-}$ ***p<0.001; $N^{\Delta MN}8^{-/-}$ vs. $N^{\Delta MN}11^{-/-}$ p=0.112; one-way ANOVA and post hoc Tukey's HSD test).

(E-H) Radial glia organization assessed by nestin immunostaining in control (E), $N^{\Delta MN}$ (F), $N^{\Delta MN}8^{-/-}$ (G) and $N^{\Delta MN}11^{-/-}$ (H) e13.5 embryos. Magnification of the progenitor zone (PZ) and ventral horn (VH) areas on the side.

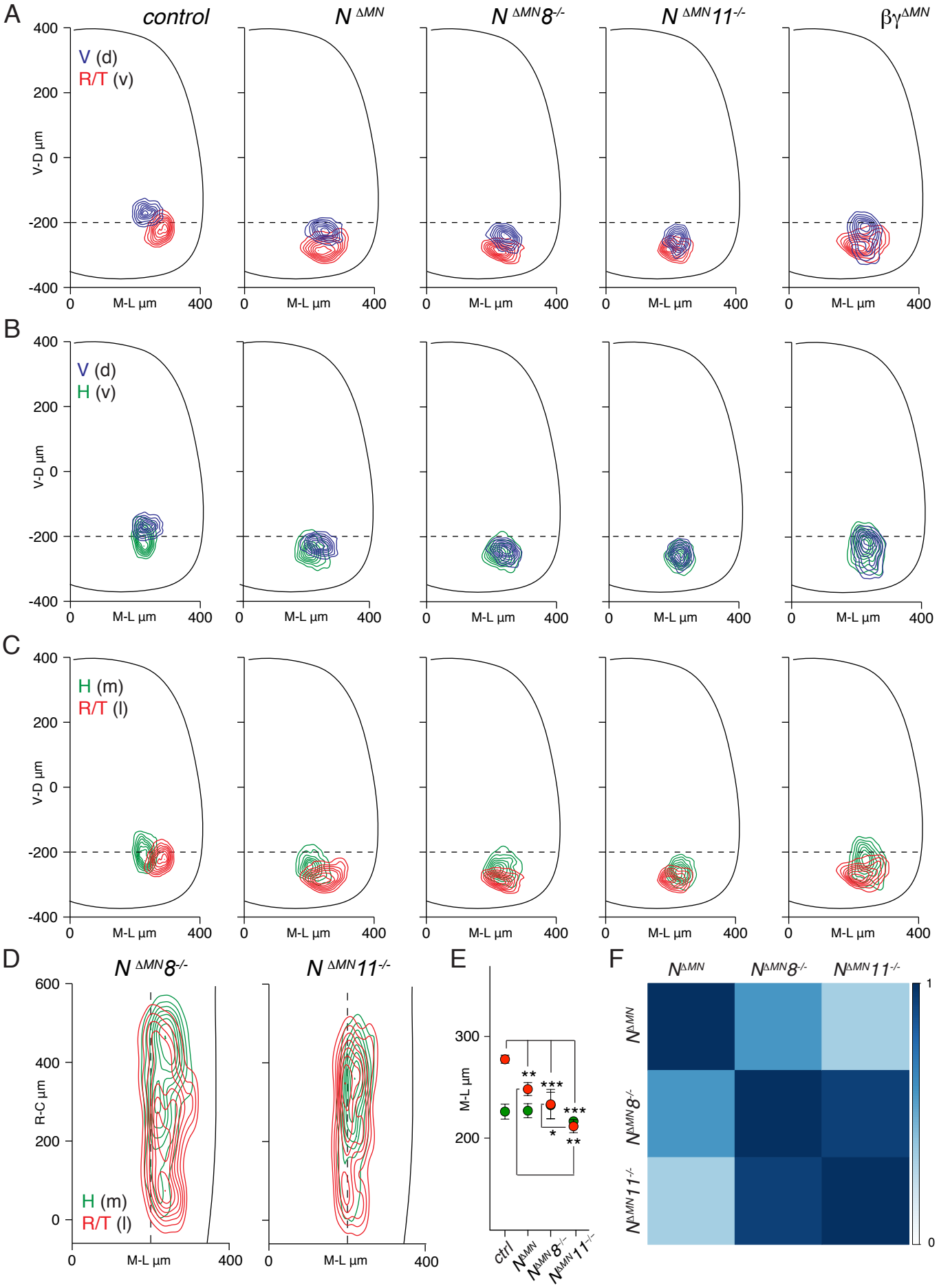

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Figure S3. Motor pools organization in cadherin/catenin mutant mice.

(A) Transverse contour plots of V (blue, dorsal) and R/T (red, ventral) neurons in control, $N^{\Delta MN}$, $N^{\Delta MN}8^{-/-}$, $N^{\Delta MN}11^{-/-}$ and $\beta\gamma^{\Delta MN}$ embryos.

(B) Transverse contour plots of V (blue, dorsal) and H (green, ventral) neurons in control, $N^{\Delta MN}$, $N^{\Delta MN}8^{-/-}$, $N^{\Delta MN}11^{-/-}$ and $\beta\gamma^{\Delta MN}$ embryos.

(C) Transverse contour plots of H (green, medial) and R/T (red, lateral) neurons in control, $N^{\Delta MN}$, $N^{\Delta MN}8^{-/-}$, $N^{\Delta MN}11^{-/-}$ and $\beta\gamma^{\Delta MN}$ embryos.

(D) Coronal contour plots of H (green, medial) and R/T (red, lateral) neurons in $N^{\Delta MN}8^{-/-}$ and $N^{\Delta MN}11^{-/-}$ embryos.

(E) Average medio-lateral position of H (green, medial) and R/T (red, lateral) neurons in control, $N^{\Delta MN}$, $N^{\Delta MN}8^{-/-}$ and $N^{\Delta MN}11^{-/-}$ embryos (mean ± SD; for H neurons: control vs. $N^{\Delta MN}$ p=0.999; control vs. $N^{\Delta MN}8^{-/-}$ p=0.810; control vs. $N^{\Delta MN}11^{-/-}$ p=0.455; $N^{\Delta MN}$ vs. $N^{\Delta MN}8^{-/-}$ p=0.868; $N^{\Delta MN}$ vs. $N^{\Delta MN}11^{-/-}$ p=0.384; $N^{\Delta MN}8^{-/-}$ vs. $N^{\Delta MN}11^{-/-}$ p=0.126. For R/T neurons: control vs. $N^{\Delta MN}$ **p<0.01; control vs. $N^{\Delta MN}8^{-/-}$ and $N^{\Delta MN}11^{-/-}$ ***p<0.001; $N^{\Delta MN}$ vs. $N^{\Delta MN}8^{-/-}$ p=0.212; $N^{\Delta MN}$ vs. $N^{\Delta MN}11^{-/-}$ **p<0.01; $N^{\Delta MN}8^{-/-}$ vs. $N^{\Delta MN}11^{-/-}$ *p<0.05; one-way ANOVA and post hoc Tukey's HSD test).

(F) Correlation analysis of V neurons dorso-ventral coordinates in $N^{\Delta MN}$, $N^{\Delta MN}8^{-/-}$, and $N^{\Delta MN}11^{-/-}$ embryos. Scale bar indicates correlation values ($N^{\Delta MN}8^{-/-}$ vs. $N^{\Delta MN}11^{-/-}$ r=0.94; $N^{\Delta MN}$ vs. $N^{\Delta MN}8^{-/-}$ r=0.34; $N^{\Delta MN}$ vs. $N^{\Delta MN}8^{-/-}$ r=0.58).

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Table S1. Genotype, number of embryos, and number of sections per embryo analyzed for positional analysis.

Experiment	MN Subtype	Genotype	Embryo ID	# of Sections/Embryo
"control"	Divisions	*afadin fl/+*	#6 #8 #25	32 27 30
"control"	Pools	*afadin fl/+*	#6 #7 #43	31 29 30
"*8/11*$^{-/-}$"	Division	*cadherin-8 -/-;* *cadherin-11 -/-*	#4 #7 #2	27 32 27
"*8/11*$^{-/-}$"	Pools	*cadherin-8 -/-;* *cadherin-11 -/-*	#2 #5 #6	26 30 24
"*6/9/10*$^{-/-}$"	Pools	*cadherin-6 -/-;* *cadherin-9 -/-;* *cadherin-10 -/-*	#1 #4 #6	19 23 17
"$N^{\Delta MN}$"	Divisions	*N-cadherin fl/-;* *Olig2::Cre +/-*	#68 #72 #73	20 30 31
"$N^{\Delta MN}$"	Pools	*N-cadherin fl/-;* *Olig2::Cre +/-*	#6 #10 #66	30 26 31
"$\beta\gamma^{\Delta MN}$"	Divisions	*β-catenin fl/fl;* *γ-catenin fl/-;* *Olig2::Cre +/-*	#9 #2 #13	31 32 30
"$\beta\gamma^{\Delta MN}$"	Pools	*β-catenin fl/fl;* *γ-catenin fl/-;* *Olig2::Cre +/-*	#2 #3 #4	25 28 28
"$N^{\Delta MN}$*8*$^{-/-}$"	Divisions	*N-cadherin fl/-;* *cadherin-8 -/-;* *Olig2::Cre +/-*	#40 #58 #60	29 31 31
"$N^{\Delta MN}$*8*$^{-/-}$"	Pools	*N-cadherin fl/-;* *cadherin-8 -/-;* *Olig2::Cre +/-*	#5 #64 #110	24 26 26
"$N^{\Delta MN}$*11*$^{-/-}$"	Pools	*N-cadherin fl/-;* *cadherin-11 -/-;* *Olig2::Cre +/-*	#4 #5 #7 #8	24 28 21 19

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