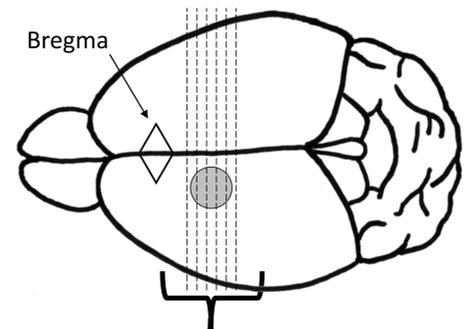


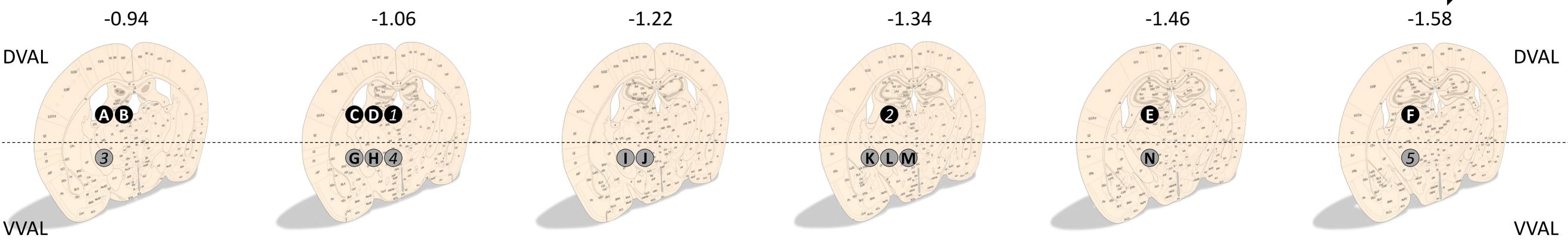
A Thalamus Injections:



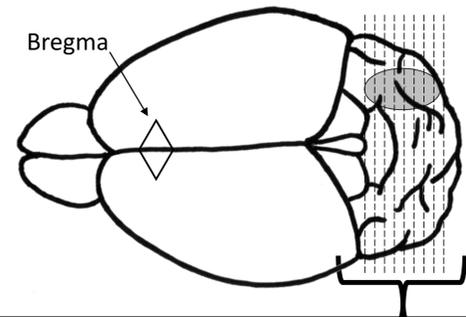
- Control DVAL trace INJ (A-F)
- Control DVAL no trace INJ (1-2)
- Control VVAL trace INJ (G-N)
- Control VVAL no trace INJ (3-5)

Rostral Caudal

Thalamus Injection Sections (mm from Bregma)



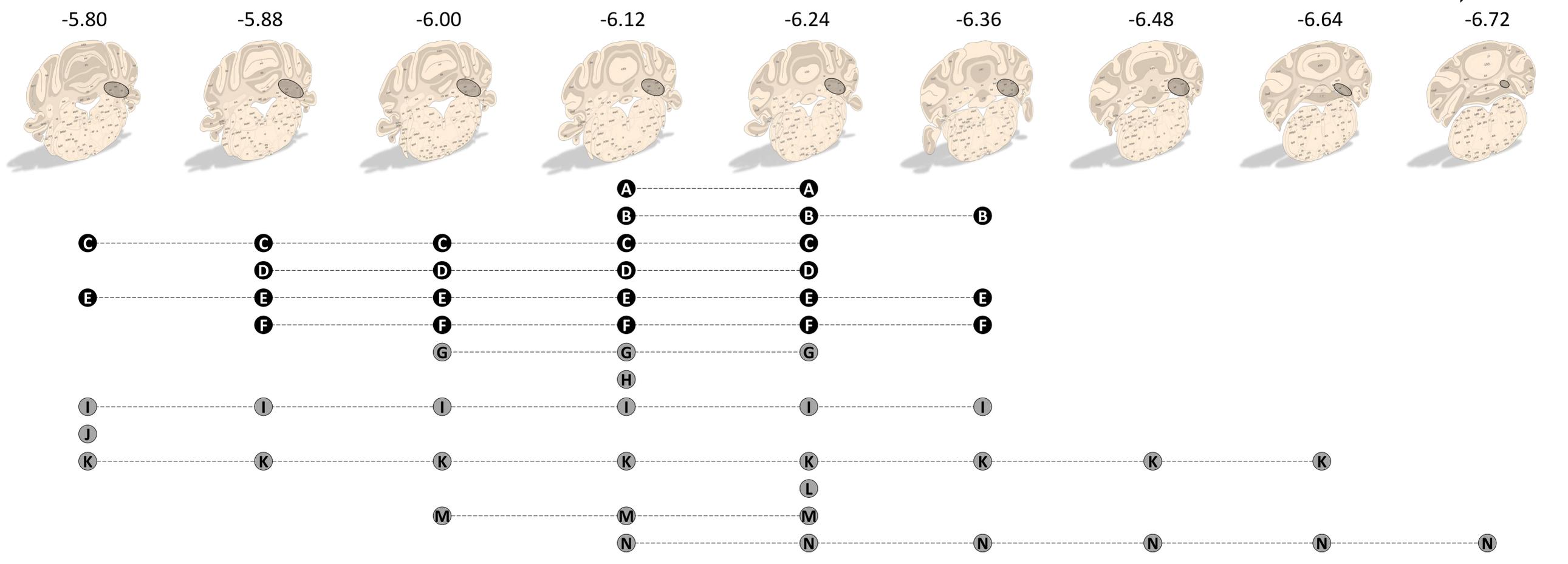
B Cerebellar Cell Tracing:



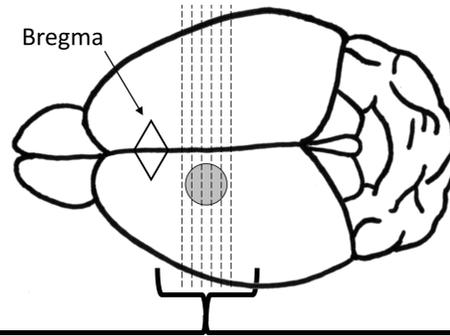
- Control DVAL trace INJ (A-F)
- Control VVAL trace INJ (G-N)

Rostral Caudal

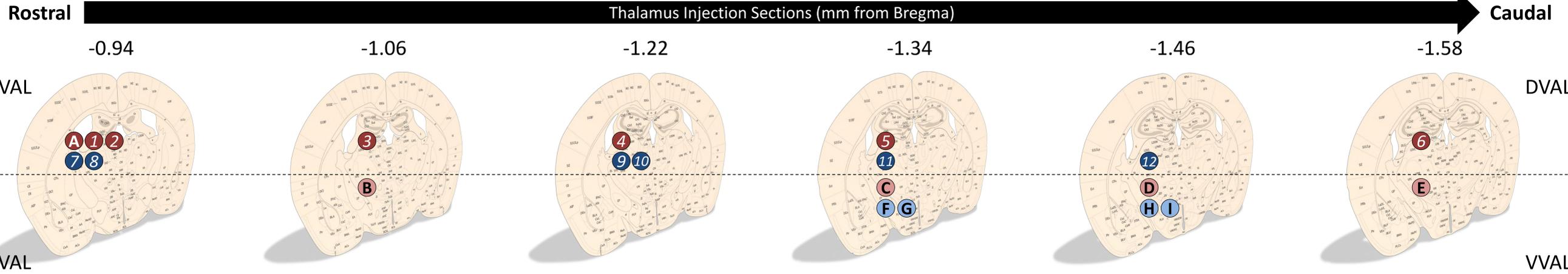
Deep Cerebellar Nuclei Sections (mm from Bregma)



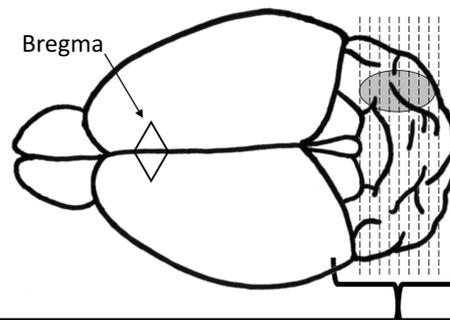
C Thalamus Injections:



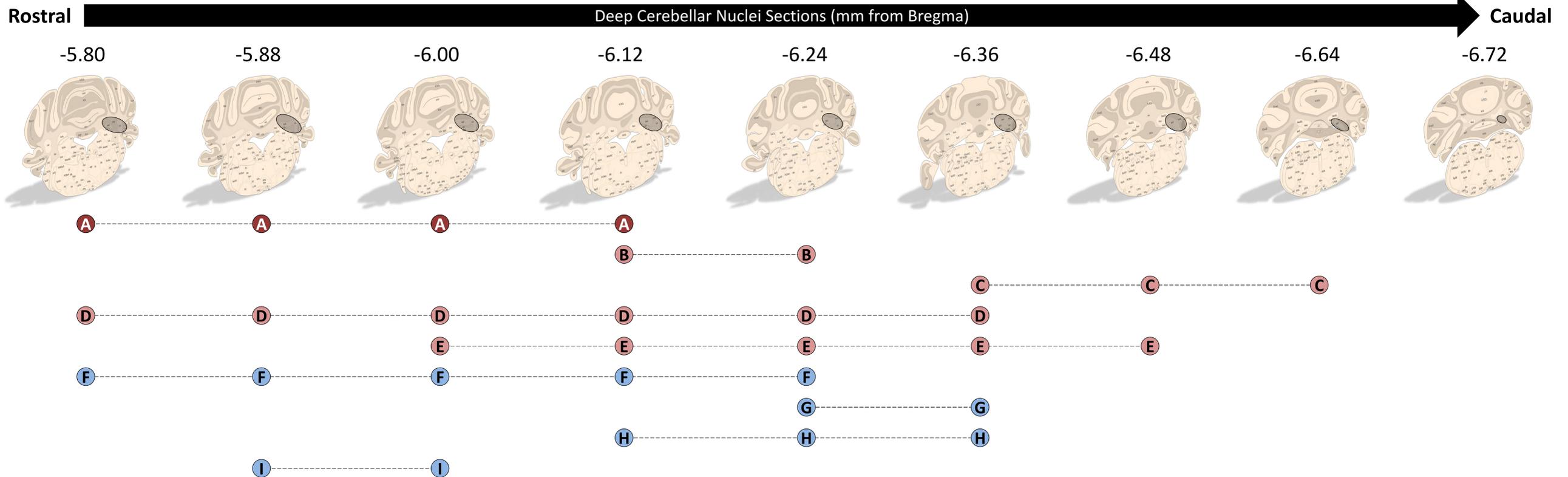
- *Arl13b^{Nex-Cre}* DVAL trace INJ (A)
- *Arl13b^{Nex-Cre}* DVAL no trace INJ (1-6)
- *Arl13b^{Nex-Cre}* VVAL trace INJ (B-E)
- *Smo^{Nex-Cre}* DVAL no trace INJ (7-12)
- *Smo^{Nex-Cre}* VVAL trace INJ (F-I)



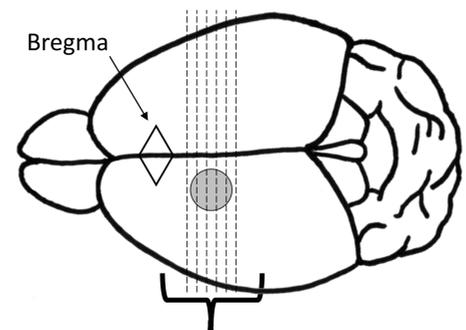
D Cerebellar Cell Tracing:



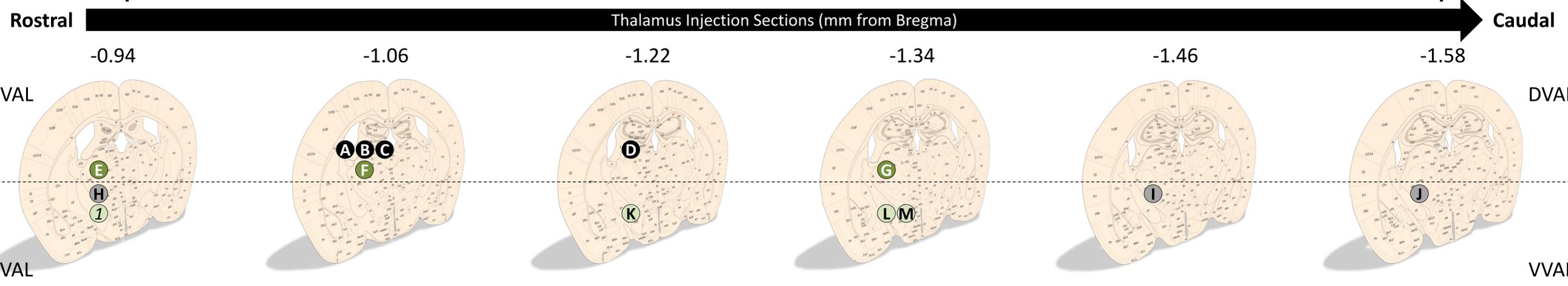
- *Arl13b^{Nex-Cre}* DVAL trace INJ (A)
- *Arl13b^{Nex-Cre}* VVAL trace INJ (B-E)
- *Smo^{Nex-Cre}* VVAL trace INJ (F-I)



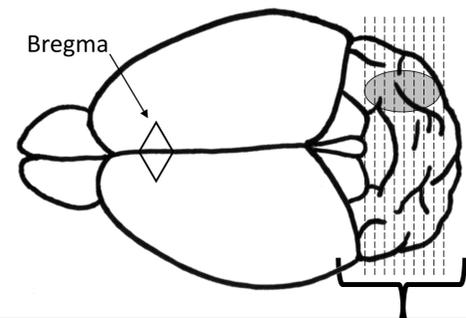
E Thalamus Injections:



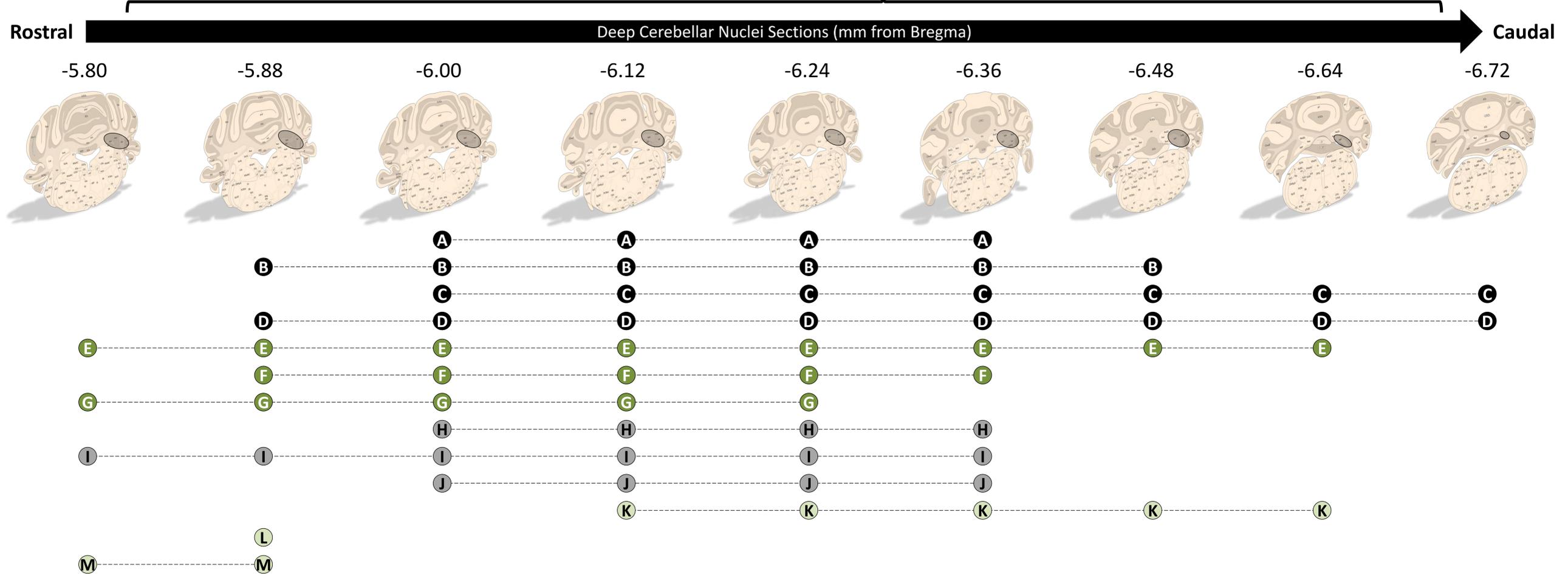
- *Arl13b*^{R79Q/+} DVAL trace INJ (A-D)
- *Arl13b*^{R79Q/R79Q} DVAL trace INJ (E-G)
- *Arl13b*^{R79Q/+} VVAL trace INJ (H-J)
- *Arl13b*^{R79Q/R79Q} VVAL trace INJ (K-M)
- *Arl13b*^{R79Q/R79Q} VVAL no trace INJ (1)



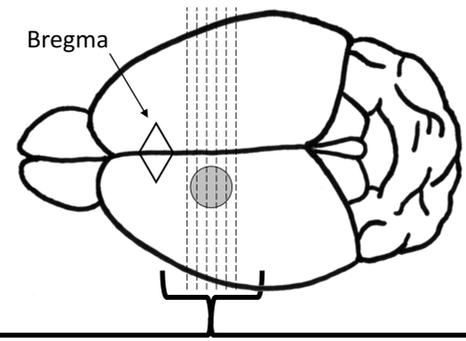
F Cerebellar Cell Tracing:



- *Arl13b*^{R79Q/+} DVAL trace INJ (A-D)
- *Arl13b*^{R79Q/R79Q} DVAL trace INJ (E-G)
- *Arl13b*^{R79Q/+} VVAL trace INJ (H-J)
- *Arl13b*^{R79Q/R79Q} VVAL trace INJ (K-M)

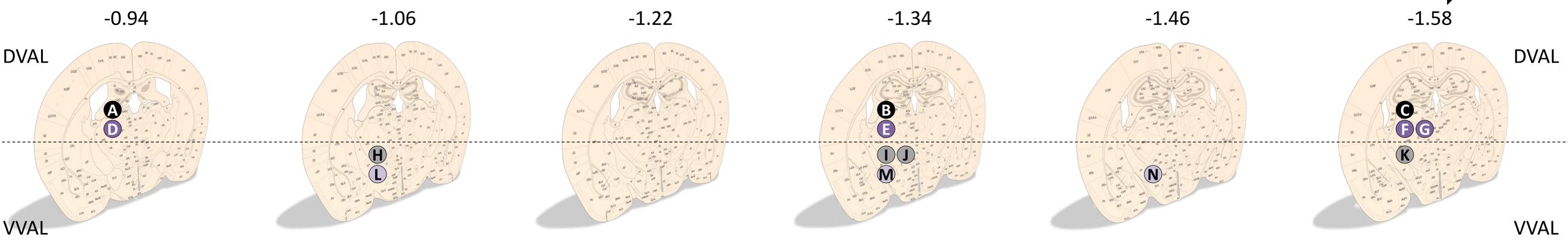


G Thalamus Injections:

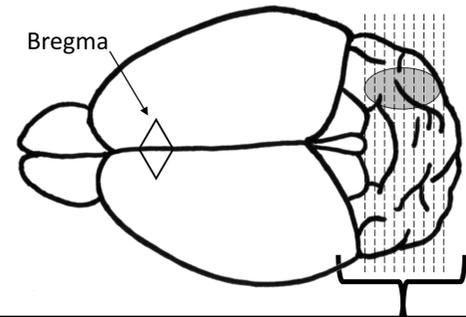


- *Arl13b*^{V358A/+} DVAL trace INJ (A-C)
- *Arl13b*^{V358A/V358A} DVAL trace INJ (D-G)
- *Arl13b*^{V358A/+} VVAL trace INJ (H-K)
- *Arl13b*^{V358A/V358A} VVAL trace INJ (L-N)

Rostral Caudal
Thalamus Injection Sections (mm from Bregma)



H Cerebellar Cell Tracing:



- *Arl13b*^{V358A/+} DVAL trace INJ (A-C)
- *Arl13b*^{V358A/V358A} DVAL trace INJ (D-G)
- *Arl13b*^{V358A/+} VVAL trace INJ (H-K)
- *Arl13b*^{V358A/V358A} VVAL trace INJ (L-N)

Rostral Caudal
Deep Cerebellar Nuclei Sections (mm from Bregma)

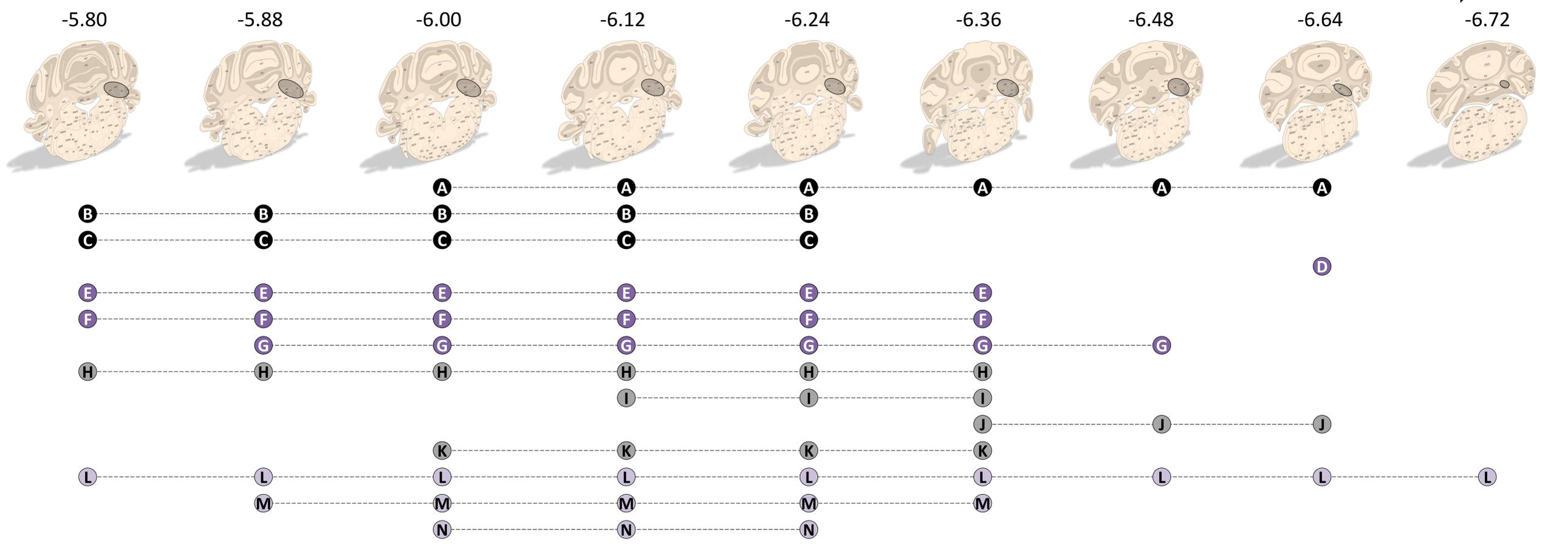


Figure S1: Total injection results. (A, C, E, G) Thalamus injection site range. Shown at top are coronal sections of the cortex at the location of the thalamus, labeled with distance from Bregma (diamond) in mm. Circles represent injection sites as identified by needle mark, presence of dye, and tissue landmarks. Injections that resulted in fluorescent labeling of deep cerebellar nuclei (DCN) are denoted by letter, whereas injections that did not result in fluorescent DCN are denoted by number. Injections into the dorsal thalamus (DVAL) are represented as dark circles with white text; injections into the ventral thalamus (VVAL) are represented as light circles with black text. (B, D, F, H) Cerebellar cell tracing range. Shown at top are coronal sections where fluorescent DCN cell clusters were observed, labeled with distance from Bregma (diamond) in mm. Shown below are lines corresponding to the lettered injection sites (from the top half of each diagram) – the lines stretch to cover and mark the cerebellar sections in which fluorescent DCN were observed. Injection and tracing results for (A-B) control, (C-D) *Arl13b*^{Nex-Cre} or *Smo*^{Nex-Cre} mutant, (E-F) *Arl13b*^{R79Q} control or mutant, and (G-H) *Arl13b*^{V358A} control or mutant mice.