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Supplemental Information

BMP Signaling Protects Telencephalic Fate by Repressing Eye Identity and Its Cxcr4-Dependent Morphogenesis

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Inventory of Supplemental Information

Supplemental Figures and Legends

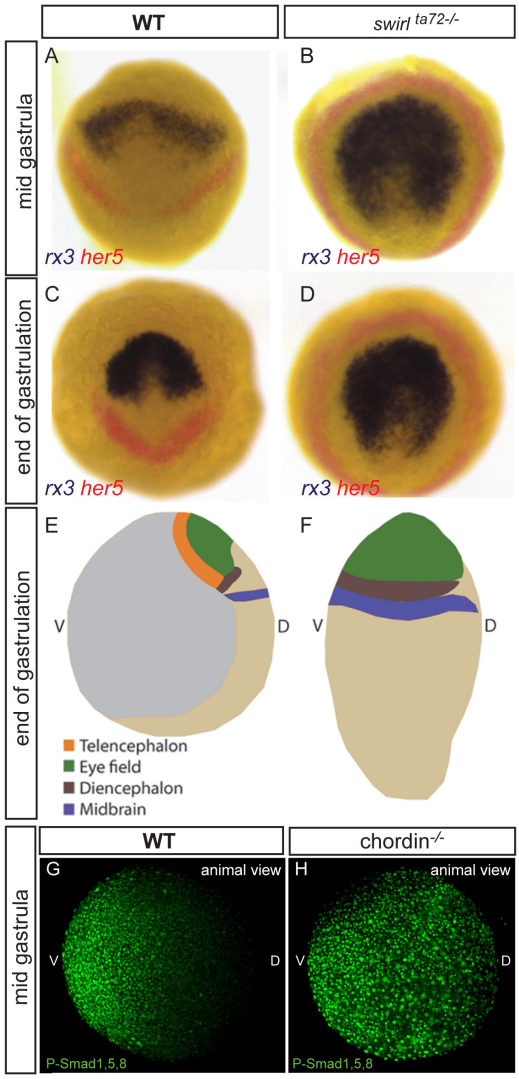


Figure S1, related to Figure 1. Expansion of the eye-field in *swr*$^{72-/-}$ can be detected from onset of *rx3* expression at mid gastrula stage onwards

Double *in situ* of early eye-field (*rx3*) and midbrain (*her5*) markers in WT (A,C) and *swr*$^{72-/-}$ (B,D) embryos at 75% epiboly (A,B) and bud stage (C,D). Dorsal view (A,C) and animal view (B,D). (E,F) Schematic overview of changes of expression pattern in WT and *swr*$^{72-/-}$ at bud stage. The telencephalon at the margin of the neural plate is the only dorsal, neural region which is not expanded but absent in *swr*$^{72-/-}$. Lateral view, dorsal to the right, anterior to the top. (G,H) Detection of P-smad1,5,8 in WT (G) and chordin$^{-/-}$ (H) embryos, animal pole view, shield to the right. Figures are z-projections of confocal sections.

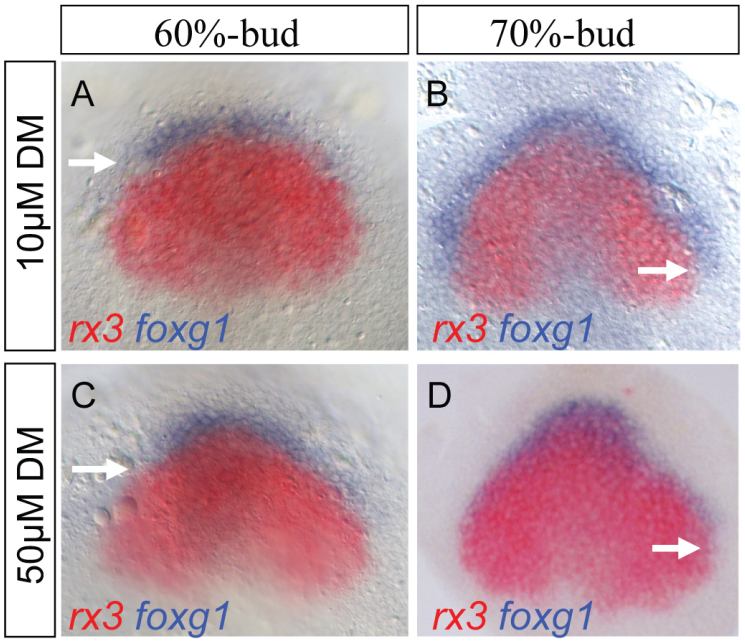


Figure S2, related to Figure 2. Increasing concentration of dorsomorphin does not alter the time window of BMP requirement for forebrain patterning.

(A-D) Embryos were treated with 10μM and 50μM of Dorsomorphin, respectively at time points indicated, fixed at bud stage and stained for *rx3*/*foxg1* expression. Arrows indicate partial *foxg1* expression domain at the anterior margin (A,C) and complete rescue of the *foxg1* expression domain (B,D). Dorsal views, anterior to the top.

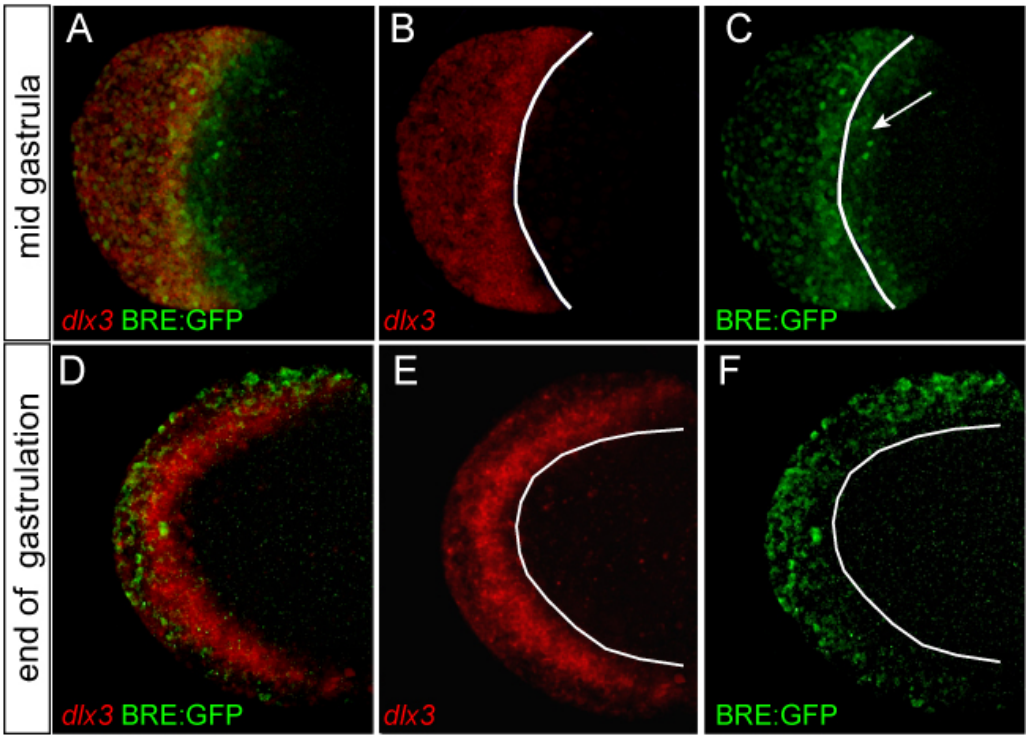
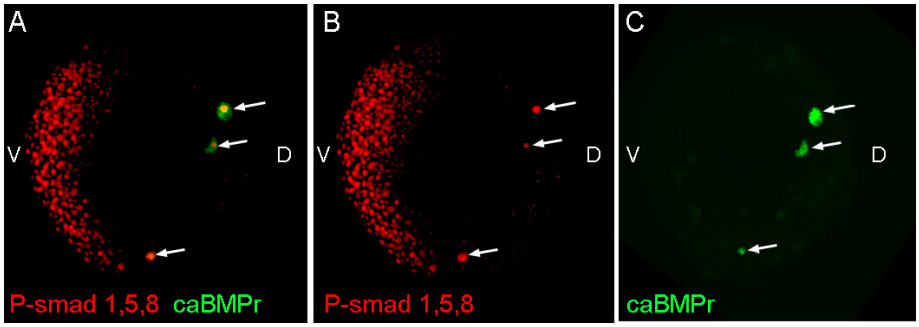


Figure S3, related to Figure 3. The zebrafish BMP Response Element GFP reporter line (BRE:GFP) indicates BMP activity at the border of the anterior neural plate at the early gastrula stage.

(A-F) BRE-GFP embryos were fixed at 65% epiboly (A-C) and bud stage (D-F), respectively, stained for GFP (green) and *dlx3* (red). White lines in (B,C,E,F) mark the border of *dlx3* expression. The white arrow points to GFP positive cells at the margin of the anterior neural plate (C). (A-C) Animal view, shield to the right, (D-F) dorsal view, anterior to the left. All figures are z-projections of confocal sections.



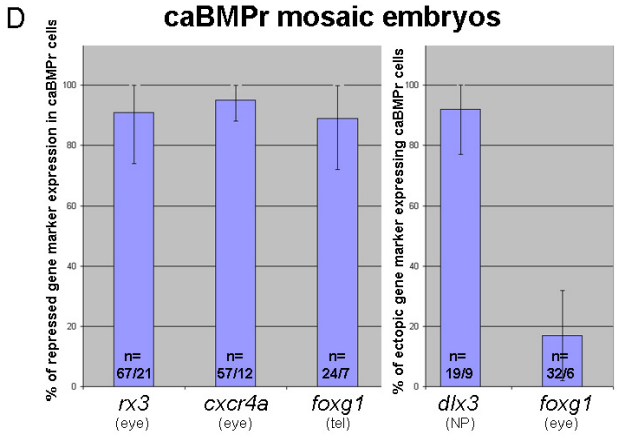


Figure S4, related to Figure 4. High levels of Psmad1,5,8 are induced cell autonomously in caBMPr transgenic cells causing robust changes of neural marker expression

(A-C) Animal view of a mid gastrula caBMPr mosaic embryo stained for P-smad1,5,8 in red, shield to the right. Arrows point to single caBMPr-transgenic cells (green cells) in the dorsal half of the embryo which ectopically induce nuclear P-smad1,5,8 (red) in a cell autonomous manner. (D) Statistical analysis of repressed and induced gene expression in caBMPr cells, respectively. n=number of cells/ number of embryos. (tel, telencephalon; NP, neural plate).

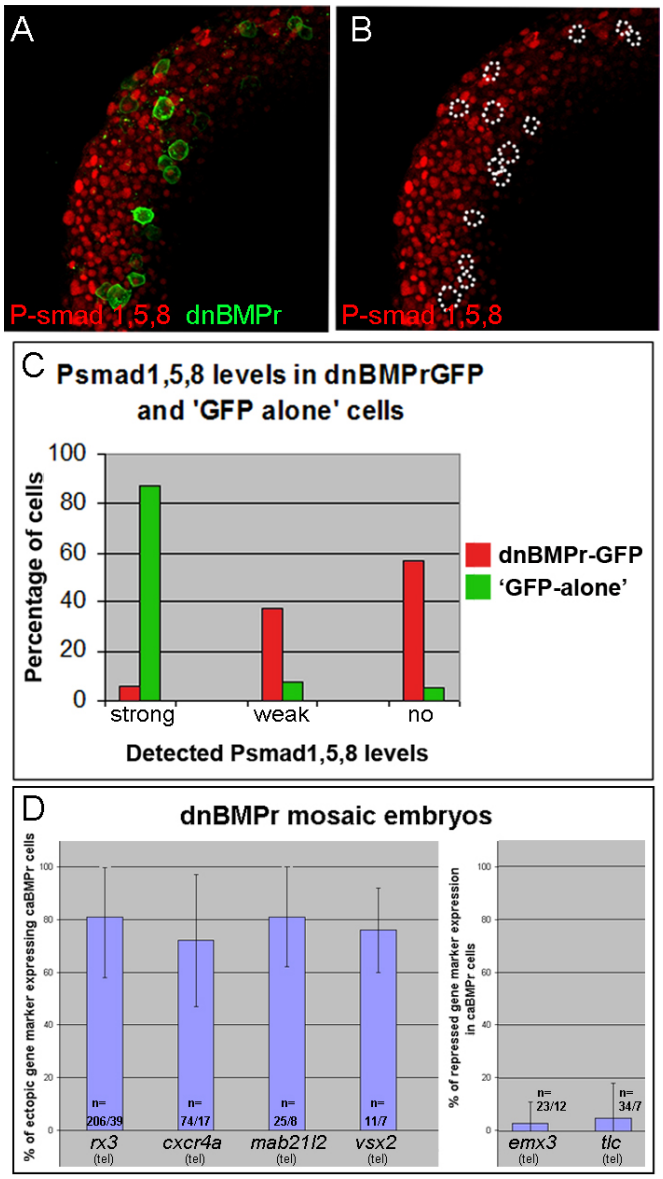


Figure S5, related to Figure 5. Majority of dnBMPr transgenic cells have no or low levels of P-Smad1,5,8

(A,B) Animal view of the ventral side of a mid gastrula dnBMPr mosaic embryo stained for P-smad1,5,8. (B) Dotted circles mark the location of dnBMPr expressing cells (green in A). (C) Distribution of P-smad1,5,8 signal intensities in dnBMPr (n=128 cells) and GFP-alone (n=148 cells) expressing cells. Statistical analysis of induced and repressed gene expression in dnBMPr cells, respectively. n=number of cells/ number of embryos. (tel, telencephalon)

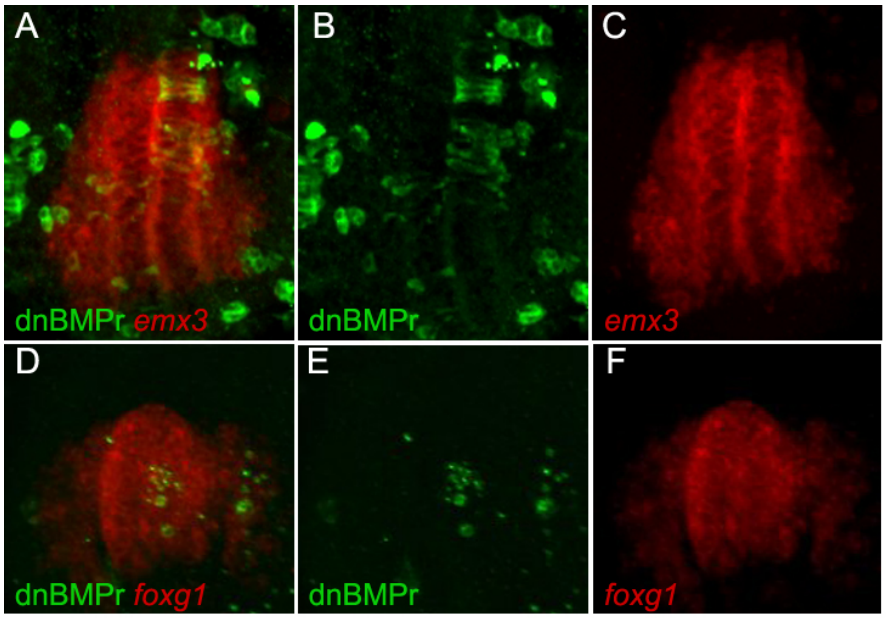


Figure S6, related to Figure 6. Telencephalic dnBMPr cells maintain expression of telencephalic markers at 24 hpf

Emx3 (A-C) and *foxg1* (D-F) *in situ* of dnBMPr mosaic embryos (HS at oblong/early blastula stage) at 24hpf. All views are dorsal, anterior to the top.

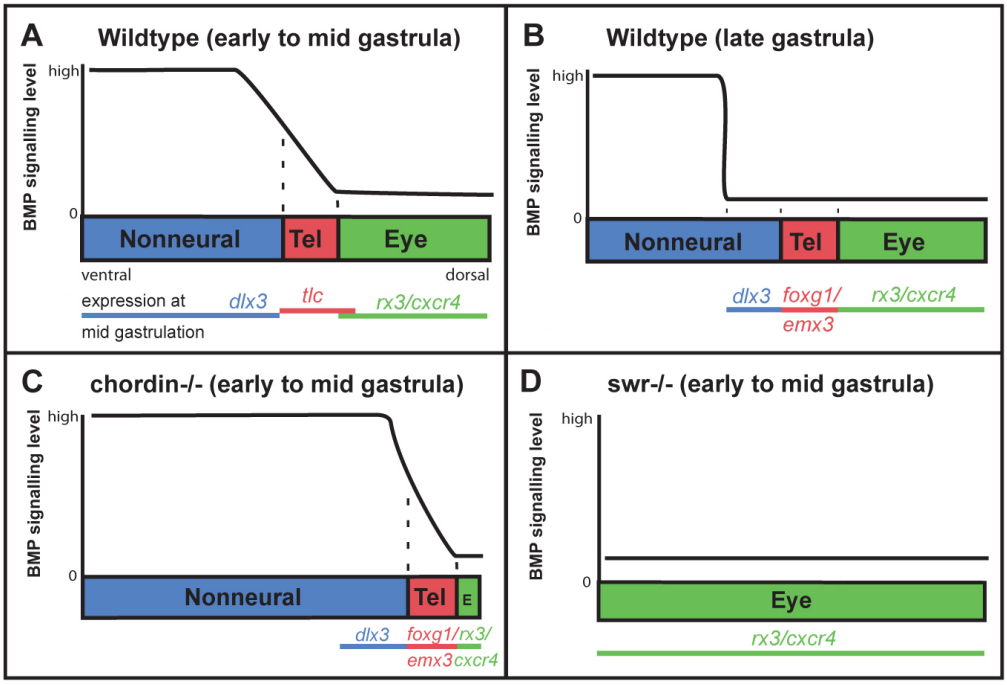


Figure S7, related to Figure 7. Model of the differential read out of BMP signalling activity in wildtype, *chordin*$^{-/-}$ and *swr*$^{72-/-}$

(A) The telencephalon in contrast to the eye-field is established at low levels of BMP activity during early gastrula stages. (B) By the end of gastrulation the shape of the BMP gradient becomes steeper, resulting in a BMP negative neural plate and adjacent neural border cells. (C) In *chordin*$^{-/-}$ embryos the BMP gradient is shifted towards the dorsal side, resulting in a much smaller neural plate. The telencephalic territory, however, is not reduced proportionally to the eye-field area. (D) In BMP depleted *swr*$^{72-/-}$ embryos only the eye-field identity as the “default fate” is established anteriorly while telencephalon and neural border cell fates are absent.