New way to control neural stem cells brings research one step closer to repairing brain injuries

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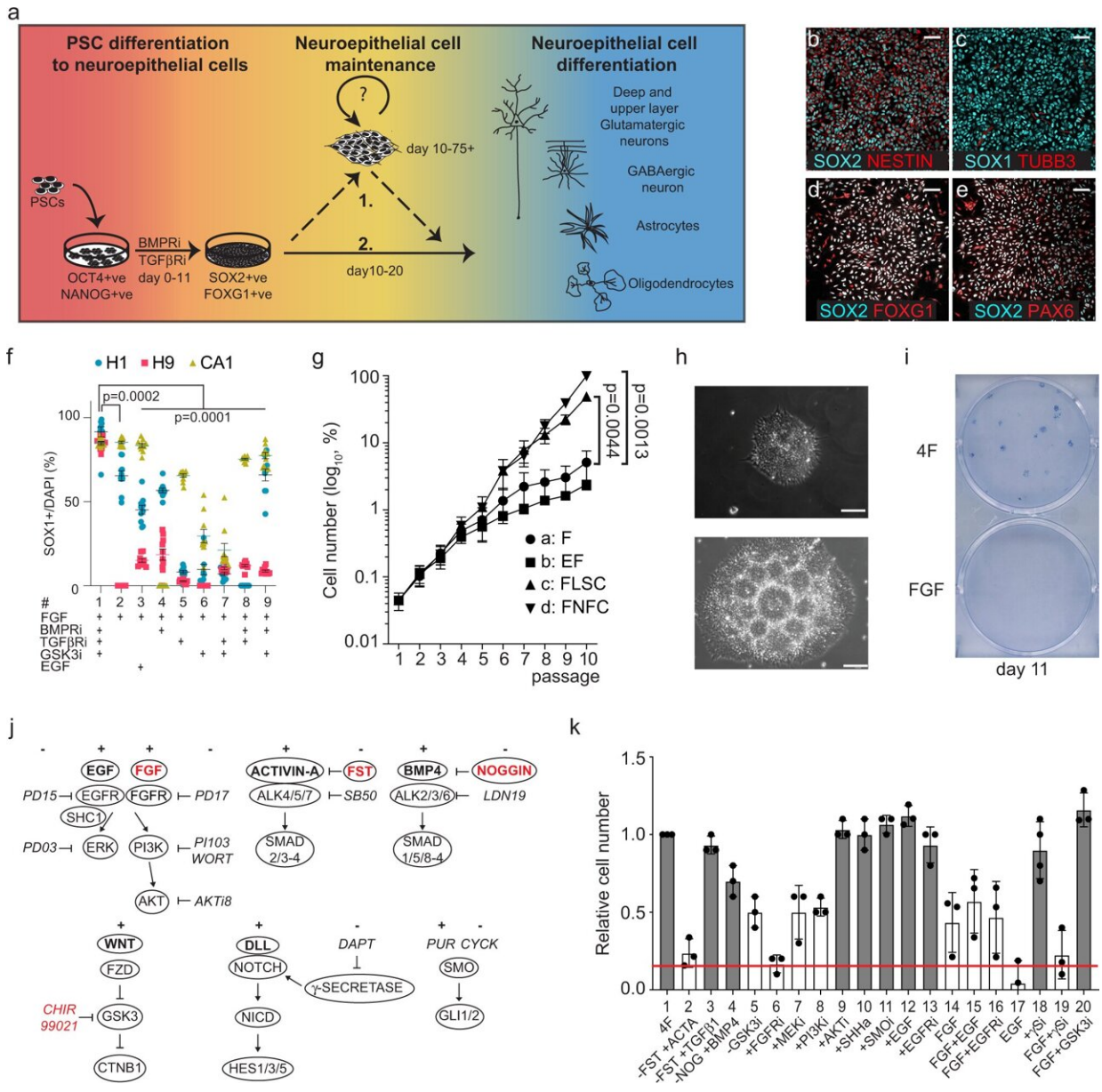

Induction and maintenance of SOX1 positive dorsal forebrain neuroepithelial cells. a Neural induction scheme of hPSCs in the presence of TGFbR and BMPR inhibitors. After cortical neural induction NES cells express NESTIN in SOX2 positive cells b SOX1 in TUBB3 negative cells c, FOXG1 d, and PAX6 e in SOX2 positive cells. The experiment was repeated with 5 biologically independent cell lines. Scalebar: 25 μm f SOX1 positive cell ratio in passage 5 cultures of hES (H1, H9, CA1) derived cNESCs treated with various combination of factors (n = 3 independent cell lines, 10 datapoints per each cell line per group, red bars are mean ± SEM, one-way ANOVA, Tukey's test). g Normalized model of cell number changes of cNESCs (Data are presented as mean ± SEM of H1-, H9-, CA1-derived cells, n = 3 independent cell lines, 2-way ANOVA, Dunnett's test) over 10 passages (30 days). h Phase contrast image of H1 derived cNESCs (p36) in 4F on day 4 (top) and on day 14 of culture (bottom) forming rosette structures. The experiment was repeated with 4 biologically independent cell lines. Scalebar: 50 μm. i: Colony formation assay of cNESCs cultured in 4F prior to seeding at 200 cells/cm2 density. j Schematic presentation of developmental signaling pathway components targeted in our assay, protein ligands are in bold and chemical inhibitors are in italic, 4F components are in red. k Quantification of cell number changes after 96-h treatment of cNESCs with indicated ligands or chemical inhibitors compared to 4F condition (n = 3 independent experiments, data are presented as mean ± SEM, 1 way ANOVA, Tukey's test, white bars are p