—Photogravure—

# *In vivo* Visualization of Estrogen Receptor α Gene Promoter Activity

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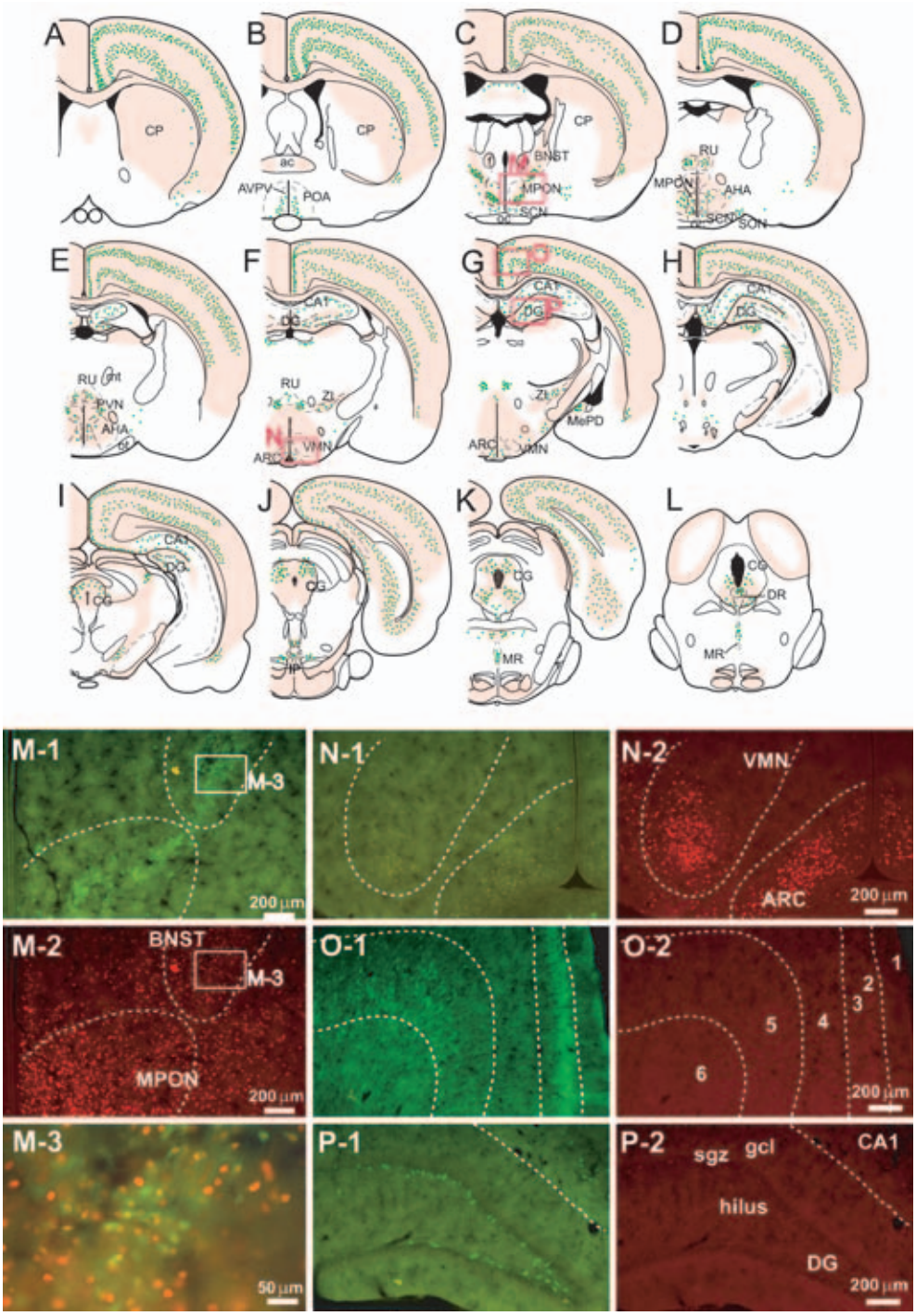


Fig. 1

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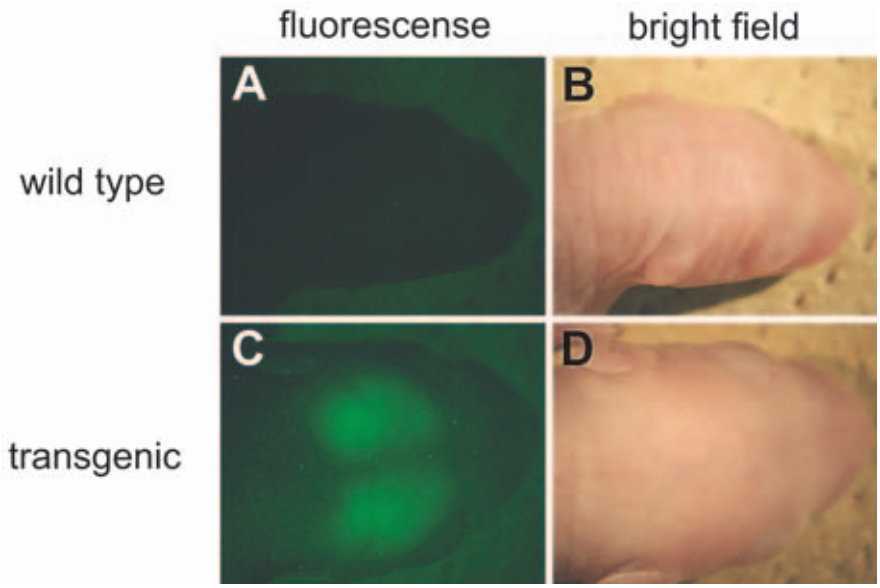


Fig. 2

Estrogen receptor (ER) α is essential for estrogen-dependent sexual differentiation in the developing brain and in the regulation of reproductive endocrinology and behavior. In the present study, transgenic rats expressing enhanced green fluorescent protein (EGFP) under the control of the ERα promoter 0/B were generated to label ERα-positive neurons in the brain[1]. This transgenic model provides an opportunity to identify and directly study estrogen-responsive neurons in situ using electrophysiological techniques. Abbreviations: ac, anterior commissure; AHA, anterior hypothalamic area; ARC, arcuate nucleus; AVPV, anteroventral periventricular nucleus; BNST, bed nucleus of the stria terminals; CA1, CA1 of the hippocampus; CG, central gray; CP, caudate putamen; DG, dentate gyrus; DR, dorsal raphe nucleus; f, fornix; gcl, granule cell layer; IP, interpeduncular nucleus; MePD, medial amygdaloid nucleus posterodorsal part; MR, median raphe nucleus; MPON, medial preoptic nucleus; mt, mammillothalamic tract; oc, optic chiasm; ot, optic tract; POA, preoptic area; PVN, paraventricular nucleus; RU, nucleus reuniens of the thalamus; SCN, suprachiasmatic nucleus; sgz, subgranular zone; SON, supra optic nucleus; VMN, ventromedial hypothalamic nucleus; ZI, zona incerta.

**Fig. 1** Rostrocaudal series of line drawings of brain sections depicting the representative localizations of EGFP-labeled cell bodies (**green dots**) and fibers (**red shadows**) in transgenic rats (A-L). Each photograph (M-P) corresponds to boxes in line drawings (green: EGFP, red: ERα immunoreactivity). In the BNST-POA, 75% of EGFP cells were immunoreactive for ERα (M-3, higher magnification of the boxes in M-1 and M-2); however, only a few cells were labeled in the VMN, which contained many ERα-immunoreactive neurons (N-1 and -2). This discrepancy could have arisen through different promoter usage. Although we did not detect ERα immunoreactivity in cortical and hippocampal structures, EGFP-labeled cells were present in these structures (O and P). Reproduced with permission from Hamada et al.[1]

**Fig. 2** Cortical EGFP expression was useful for selection of transgenic animals. With fluorescent stereomicroscopy, EGFP fluorescence can be detected clearly and easily (C).

## Reference

1. Hamada T, Wada-Kiyama Y, Sakuma Y: Visualizing forebrain-specific usage of an estrogen receptor α promoter for receptor downregulation in the rat. Mol Brain Res 2005; 139: 42–51.

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