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UNIVERSITY**



Development of Complex Curricula for Molecular Bionics and Infobionics Programs within a consortial* framework**

Consortium leader

PETER PAZMANY CATHOLIC UNIVERSITY

Consortium members

SEMMELWEIS UNIVERSITY, DIALOG CAMPUS PUBLISHER

The Project has been realised with the support of the European Union and has been co-financed by the European Social Fund ***

**Molekuláris bionika és Infobionika Szakok tananyagának komplex fejlesztése konzorciumi keretben

***A projekt az Európai Unió támogatásával, az Európai Szociális Alap társfinanszírozásával valósul meg.



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TÁMOP – 4.1.2-08/2/A/KMR-2009-0006



BEVEZETÉS A FUNKCIONÁLIS NEUROBIOLÓGIÁBA

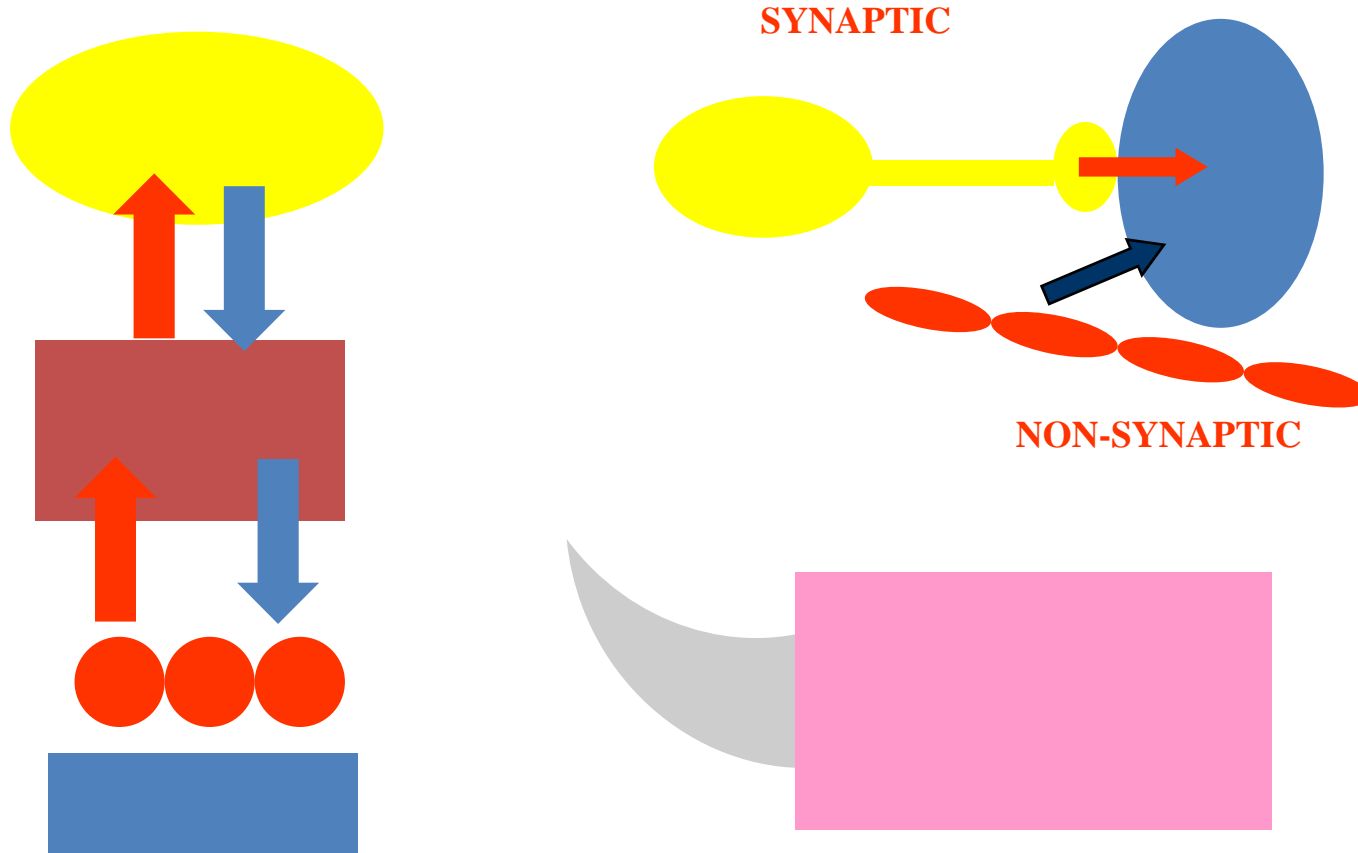
INTRODUCTION TO FUNCTIONAL NEUROBIOLOGY

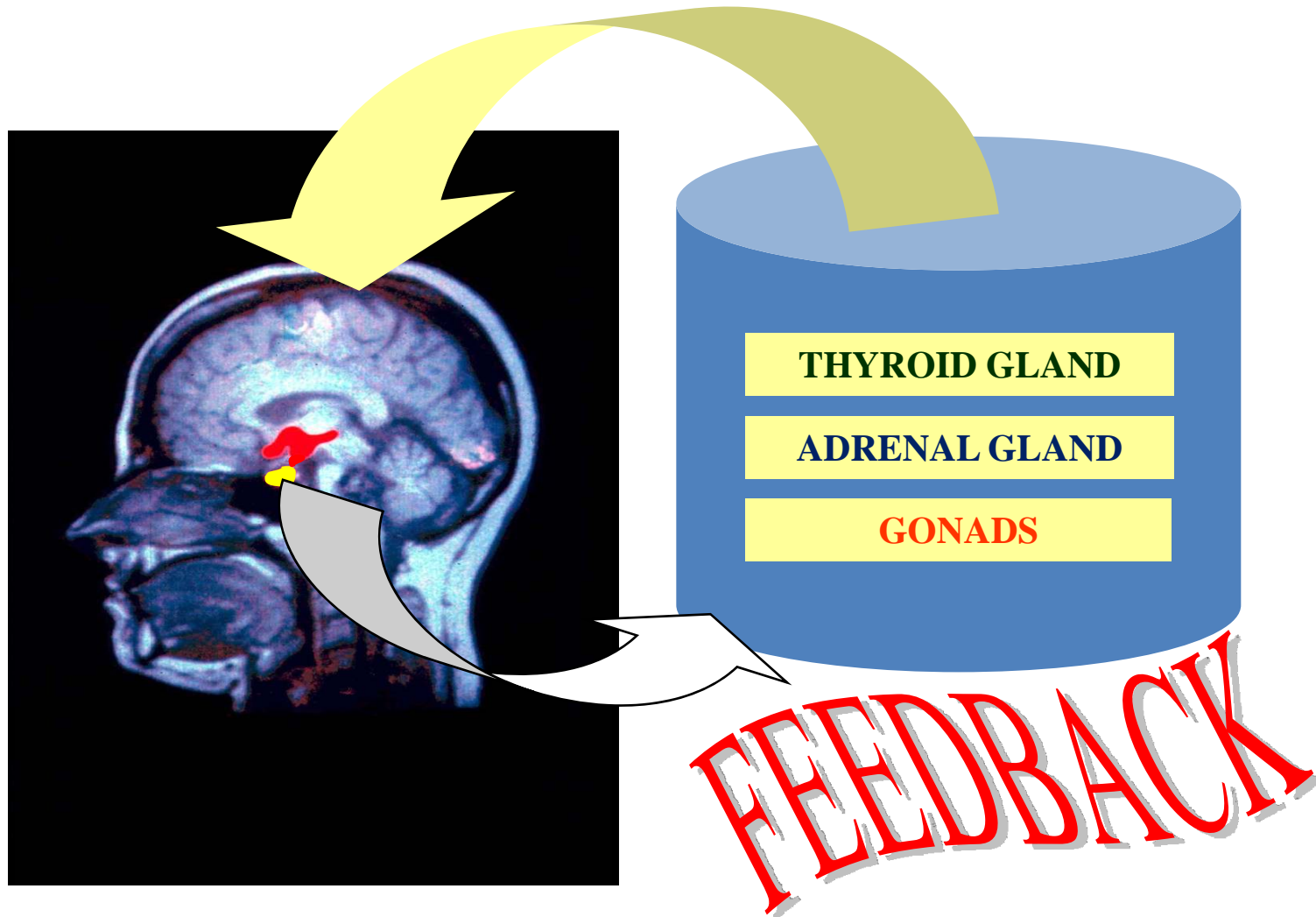
STEROID FEEDBACK TO THE BRAIN

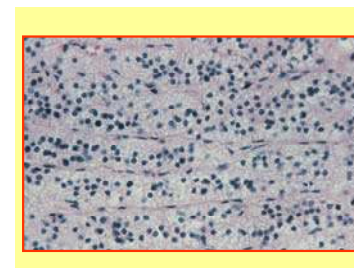
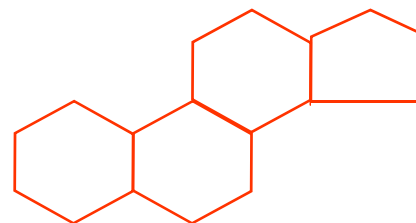
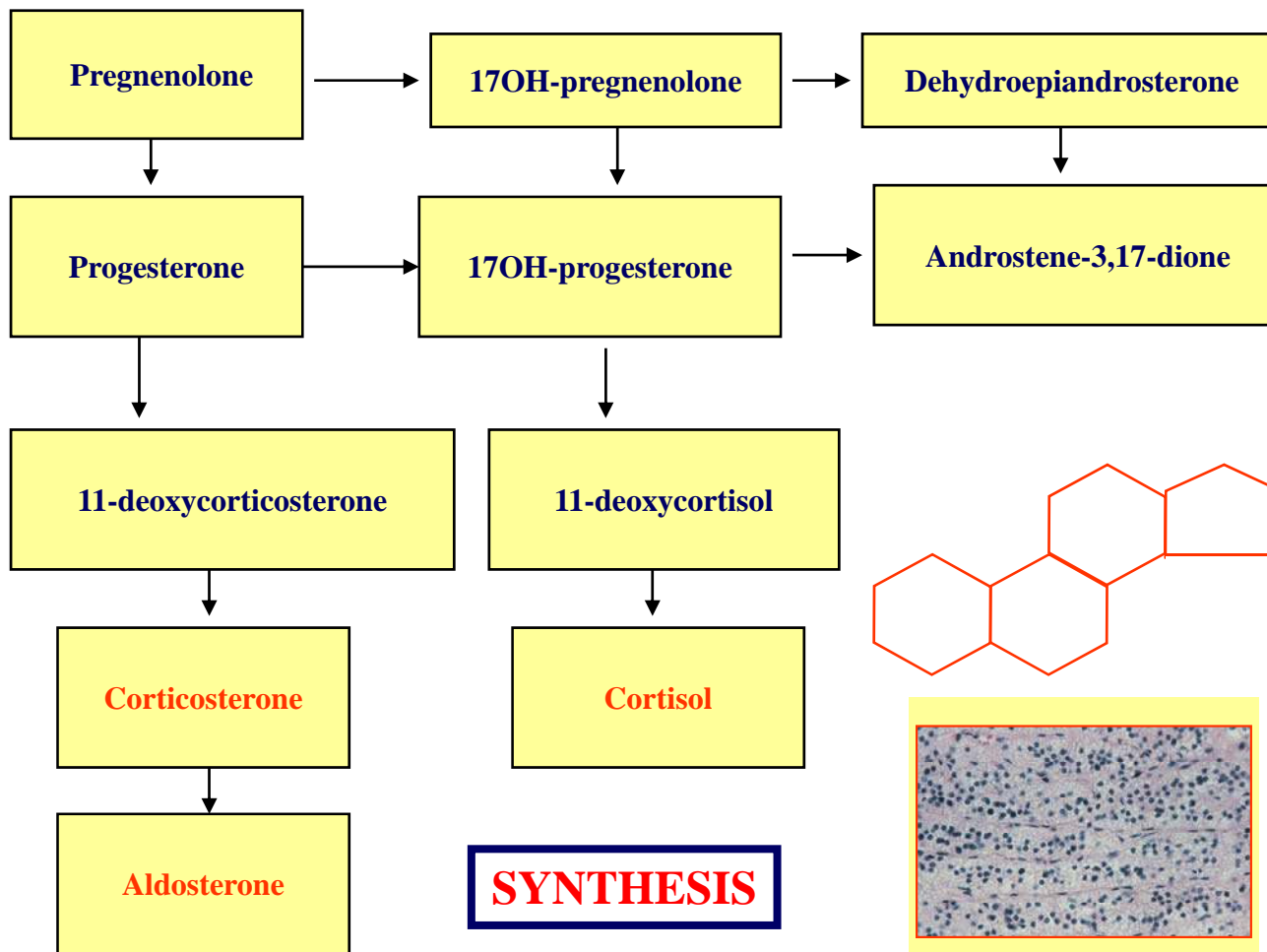
(Szteroid visszacsatolás az agyhoz)

ZSOLT LIPOSITS

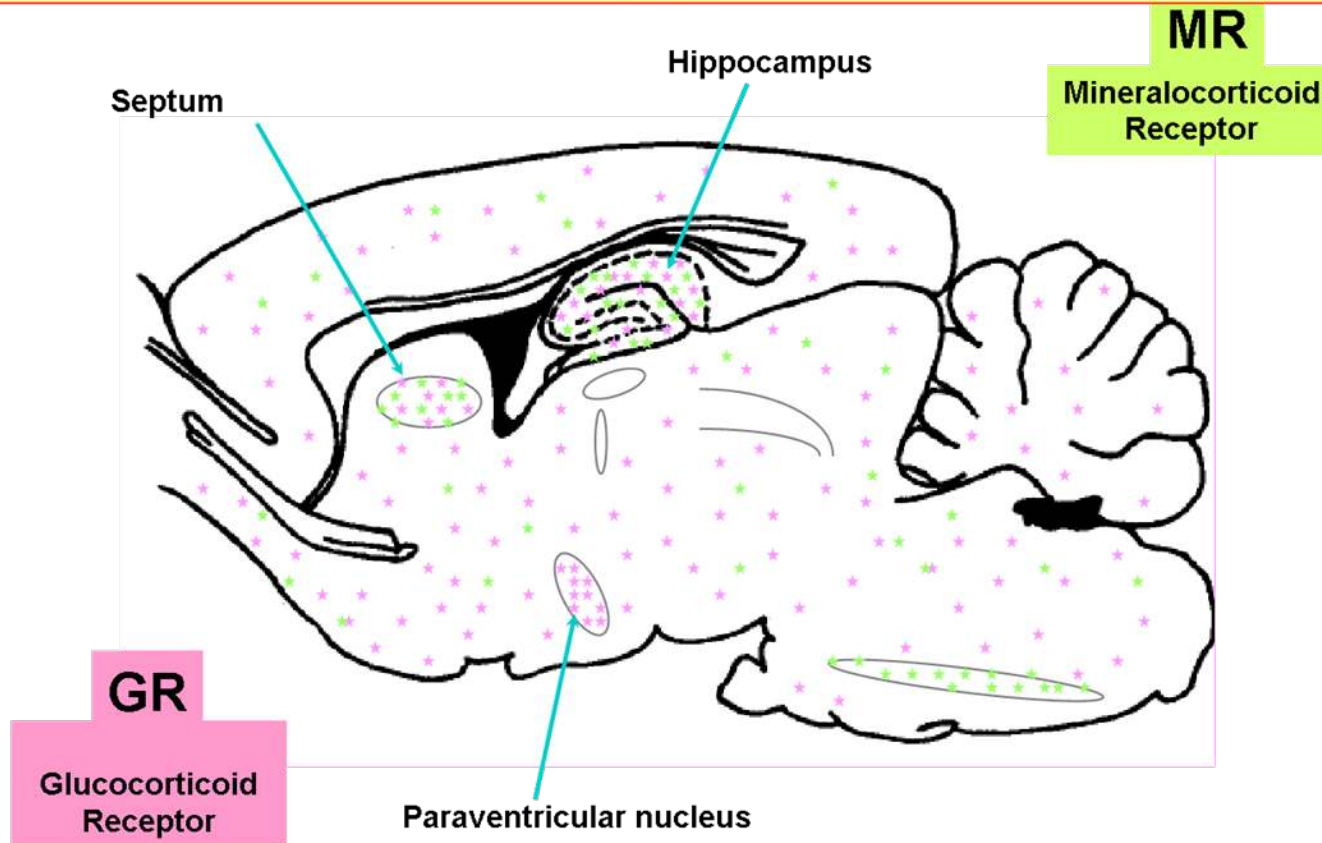
COMMUNICATION



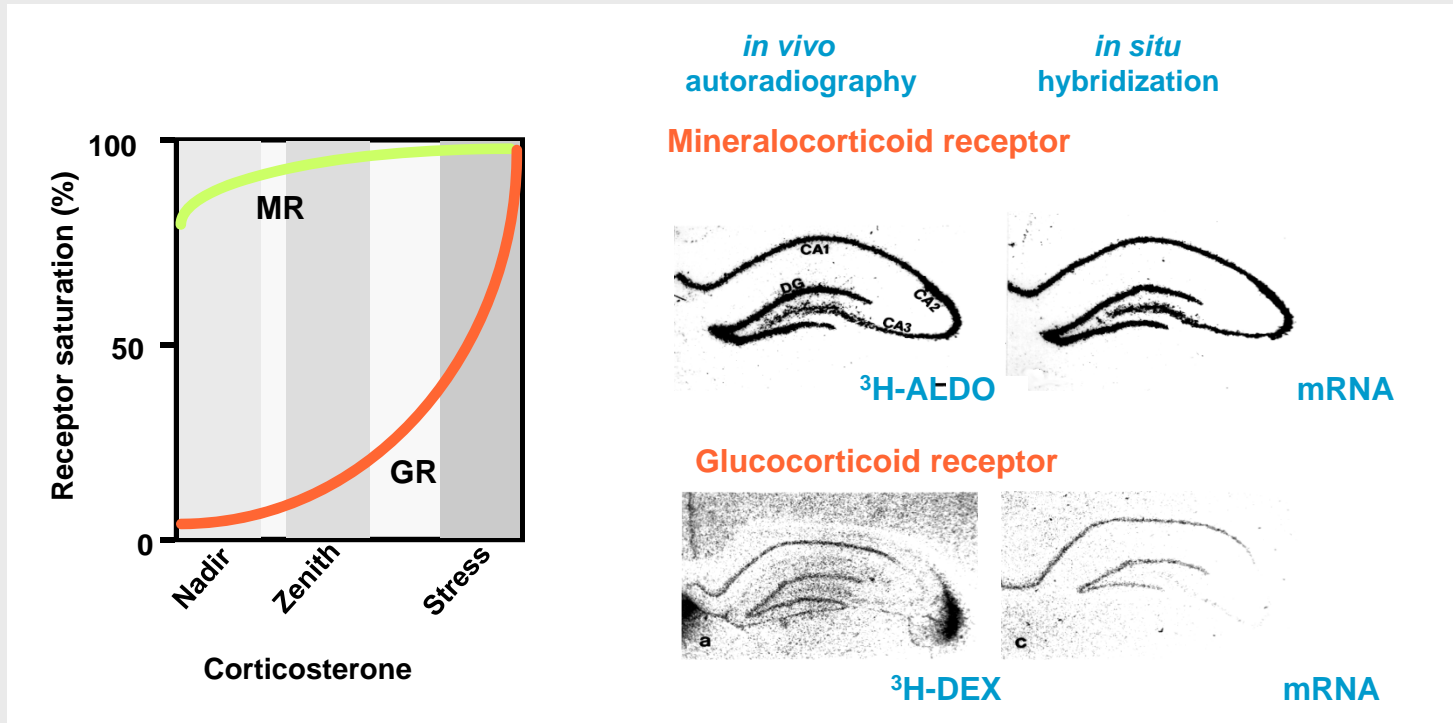




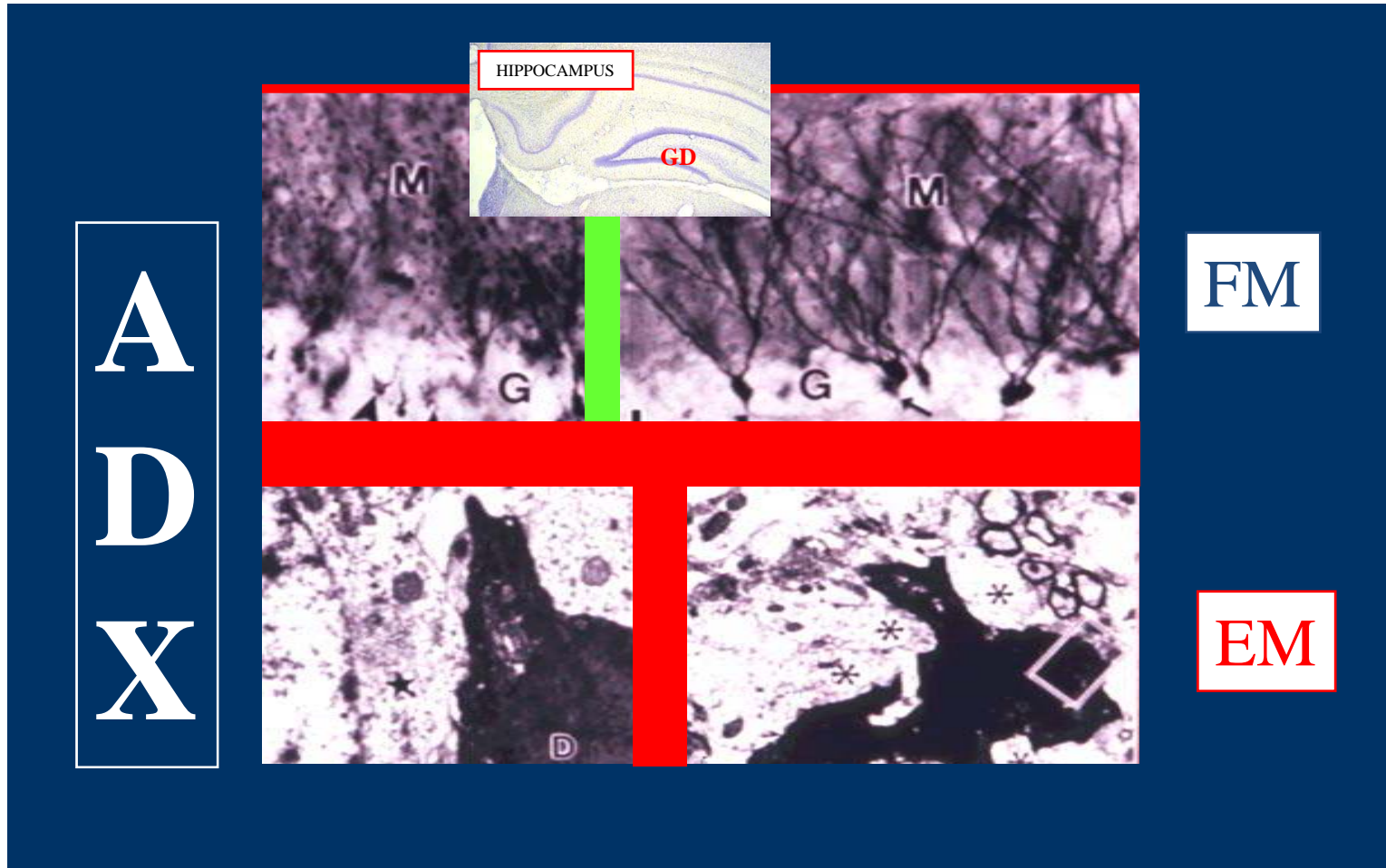
Distribution of mineralo- and glucocorticoid receptors in the brain



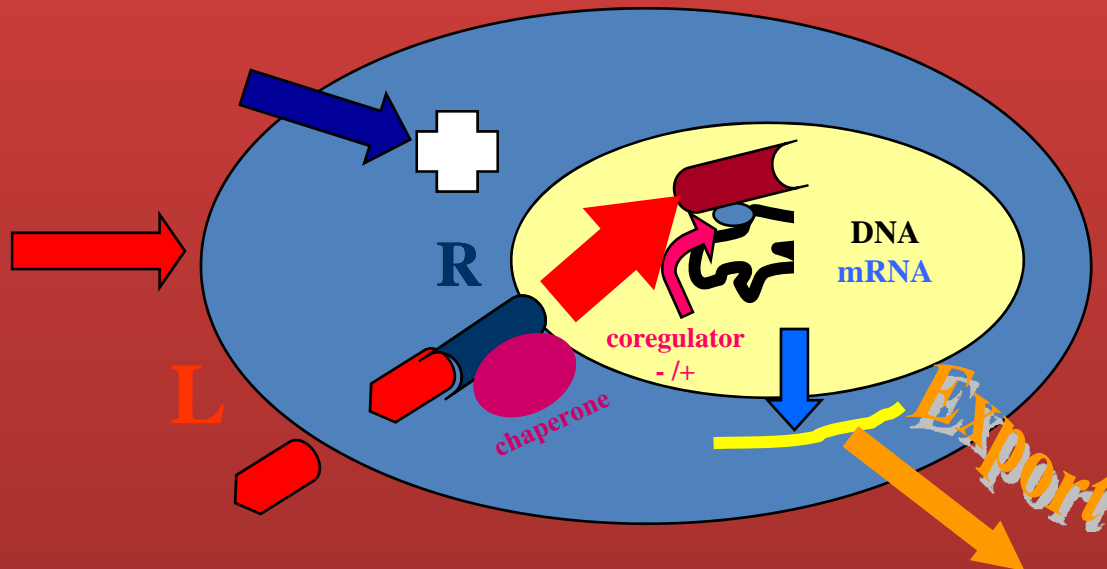
Corticosterone: 1 ligand, 2 receptors



Courtesy of Dr. O. Almeida

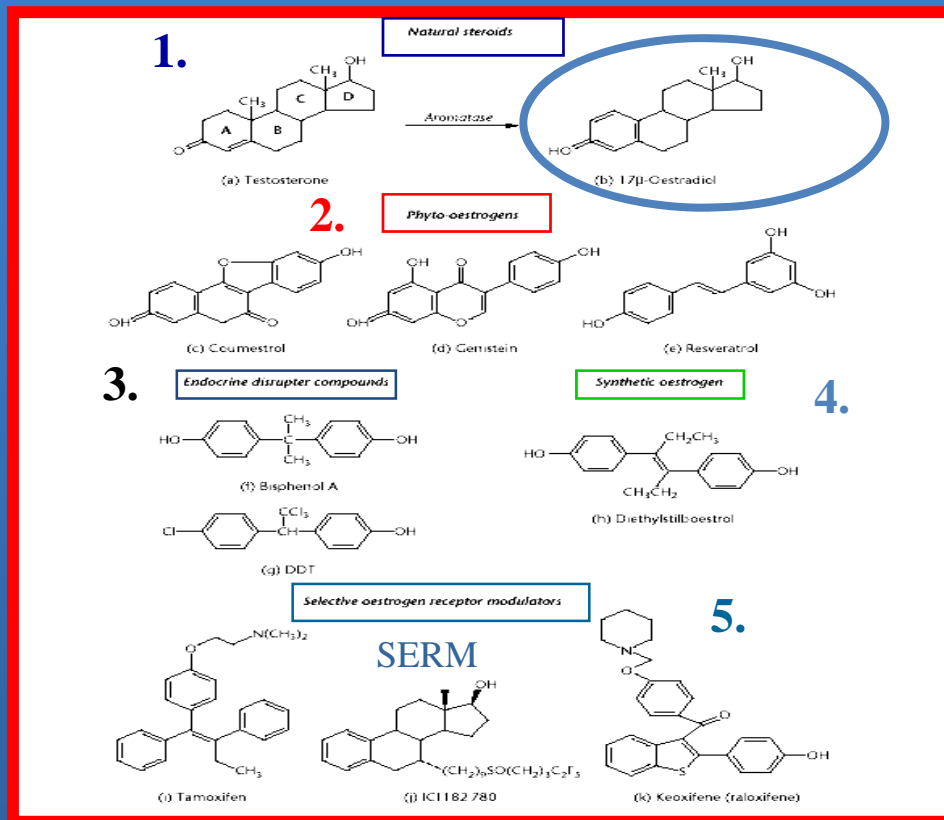


Nuclear receptor superfamily



Receptor: ligand dependent transcription factor

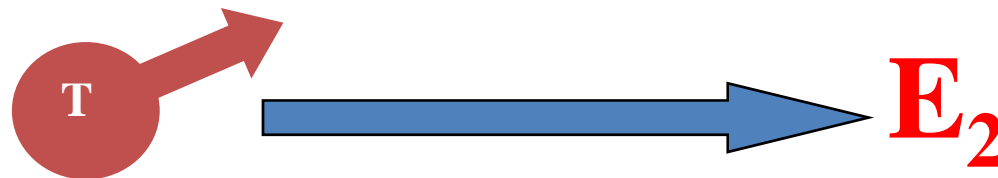
ESTROGENS



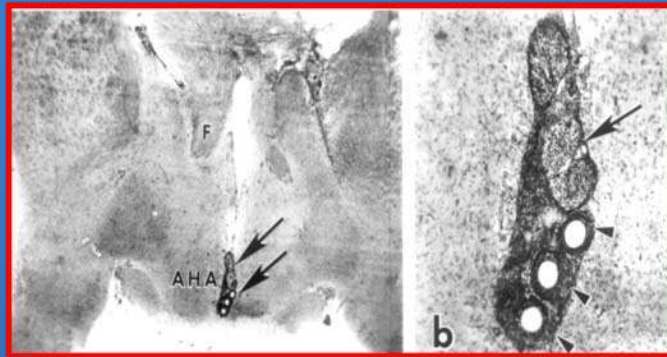


Gametogenesis
Sexual phenotype
Ovarian cycle
Sexual behavior
Bone metabolism
Cardiovascular system
Cognitive functions
Synaptic plasticity

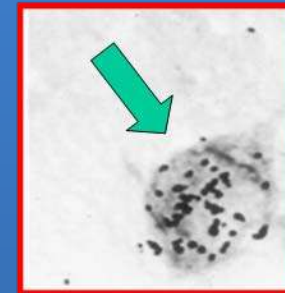
Cell proliferation in breast and uterus



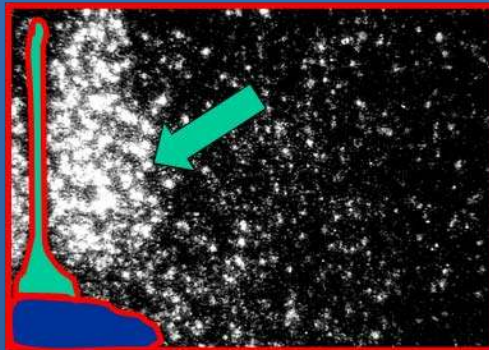
1957 FLERKÓ B, SZENTÁGOTHAJ J
bioassay



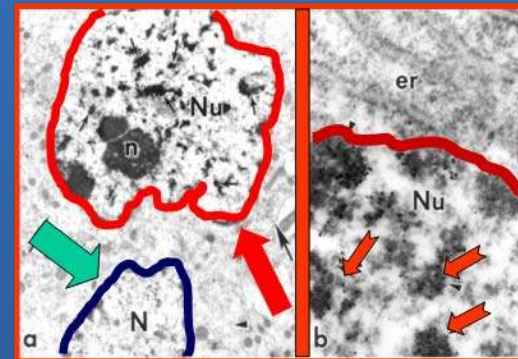
1968 STUMPF WE, 1968 PFAFF DW
³H-estradiol autoradiography



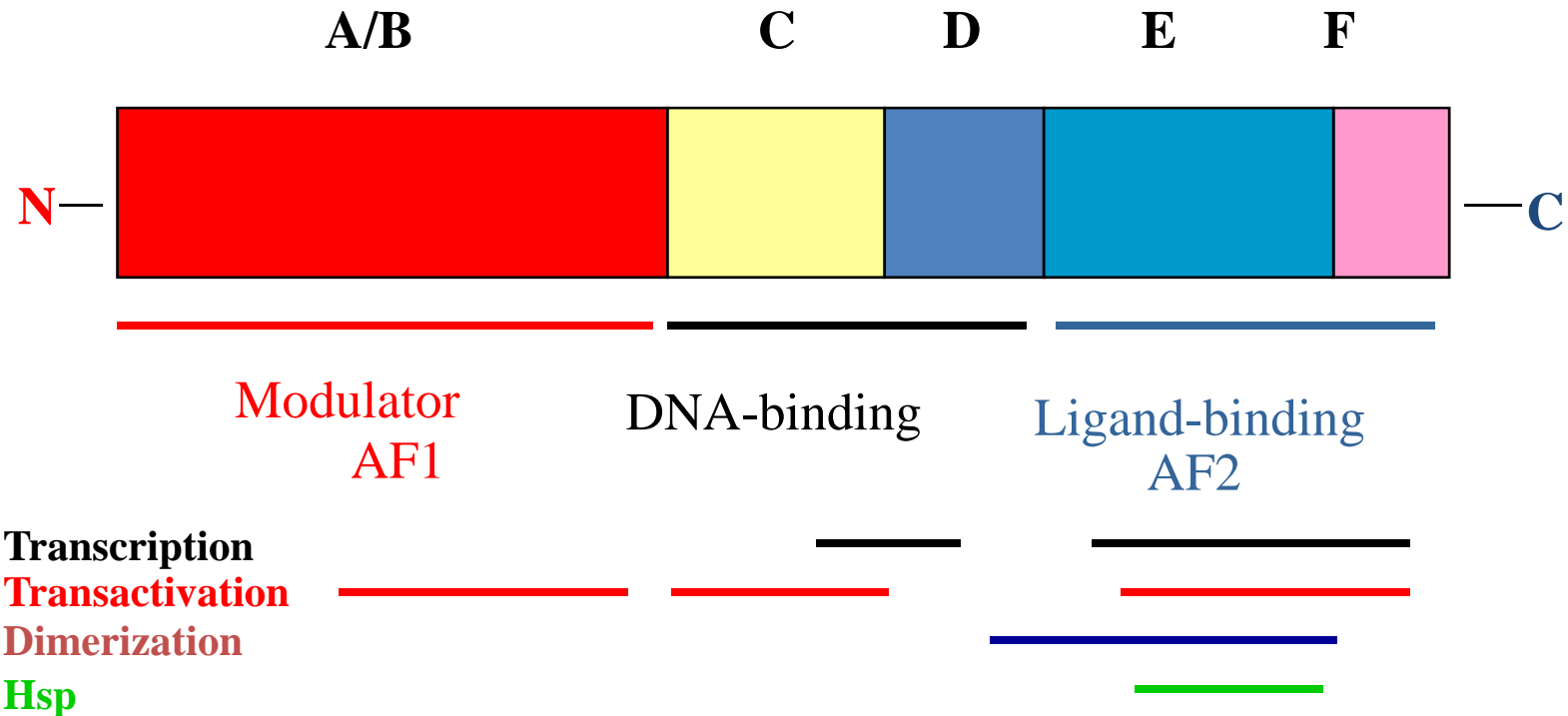
1986 GREEN S
Cloning of ER, mRNA ISH



1990 LIPOSITS ZS
ER detection in brain



Functional structure of steroid receptors

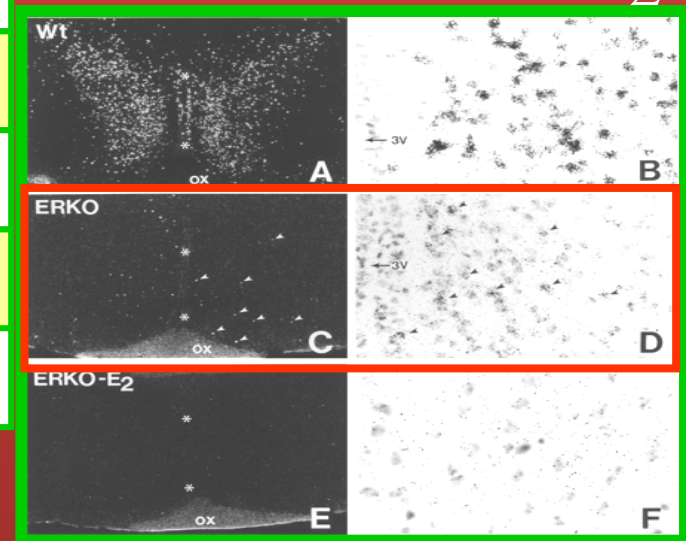


Characteristics of estrogen receptor knock out (ERKO) female mice

Gametogenesis	suppressed
Ovary	abnormal follicles
Uterus	infantile
Breast	agenesis
Estrogen level	elevated

Lubahn, DB et al., PNAS, 90:11162-11166, 1993

ERKO → ³H-E₂

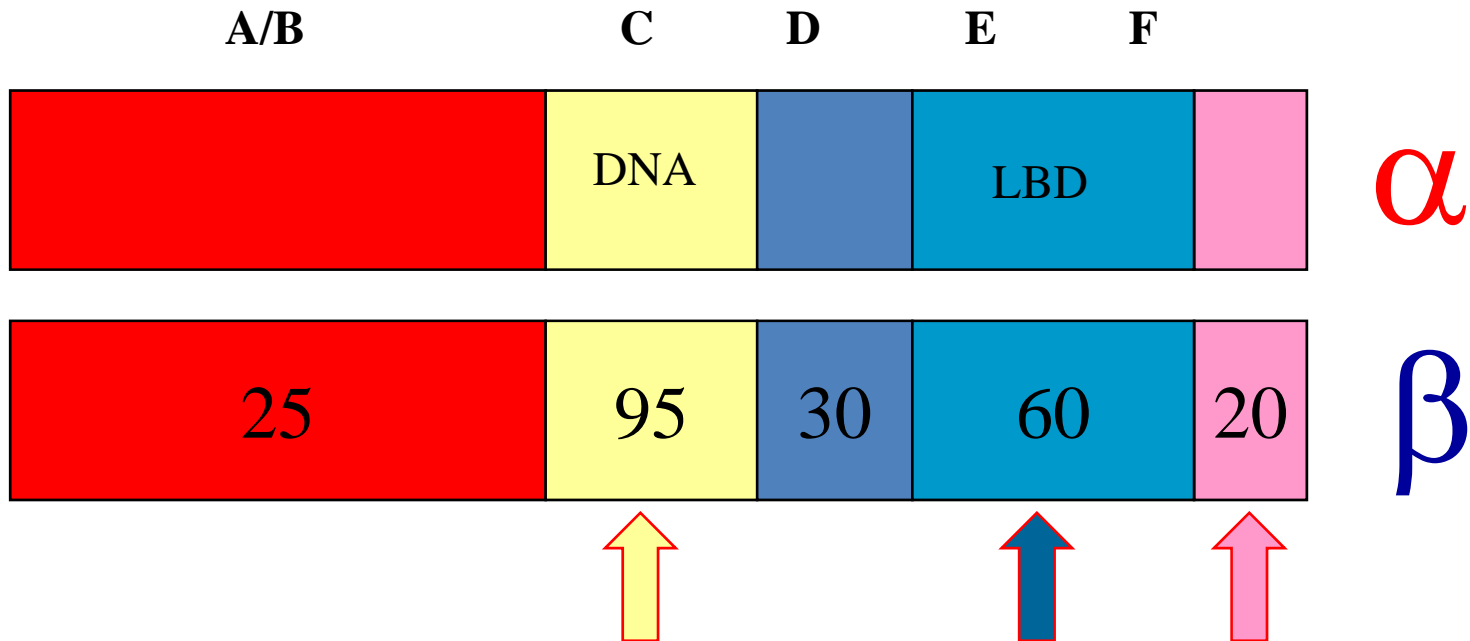


Responses in the brain of estrogen receptor disrupted mice. Shughrue, PL et al., Proc. Natl. Acad. Sci. USA: Vol. 94, 1997

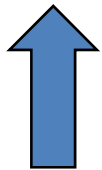
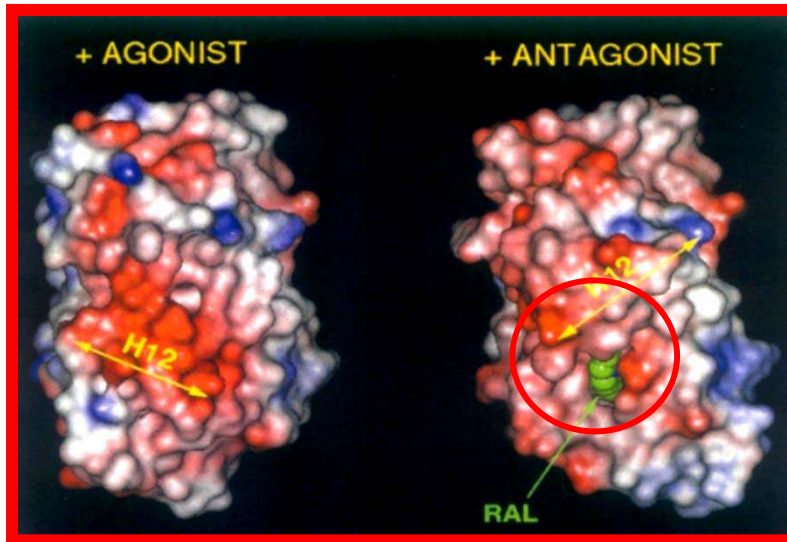
Cloning of a Novel Estrogen Receptor Expressed in Rat Prostate and Ovary

GGJM Kuiper, E Enmark, M Peltö-Huikko, S Nilsson, and J Gustafsson

Proc. Natl. Acad. Sci. USA: Vol. 93, No. 12, 5925-5930, June 11, 1996



ER- β LBD crystal structure



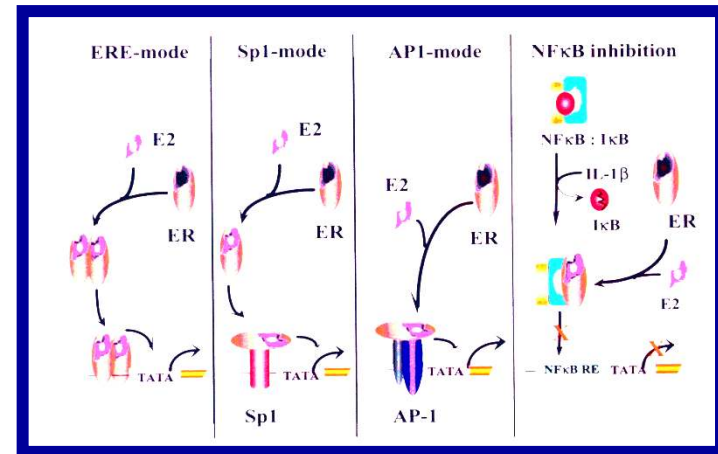
genistein



raloxifen

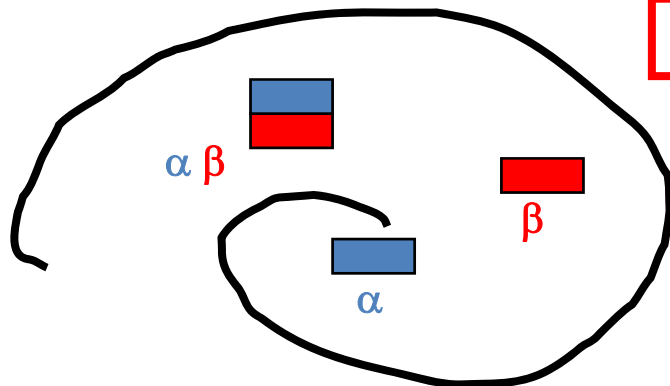
ER actions

1 2 3 4

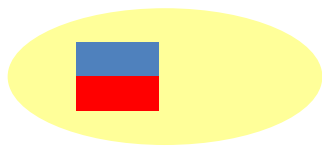
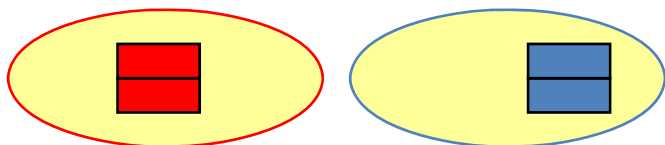


Forrás: Nillson, S., *Physiol. Rev.*, 81:1535, 2001

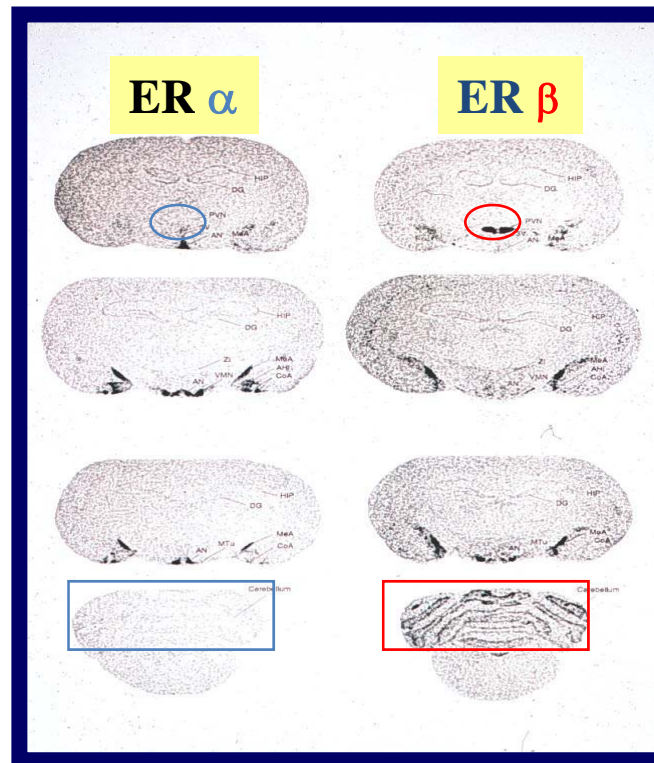
ER α and ER β distribution in brain



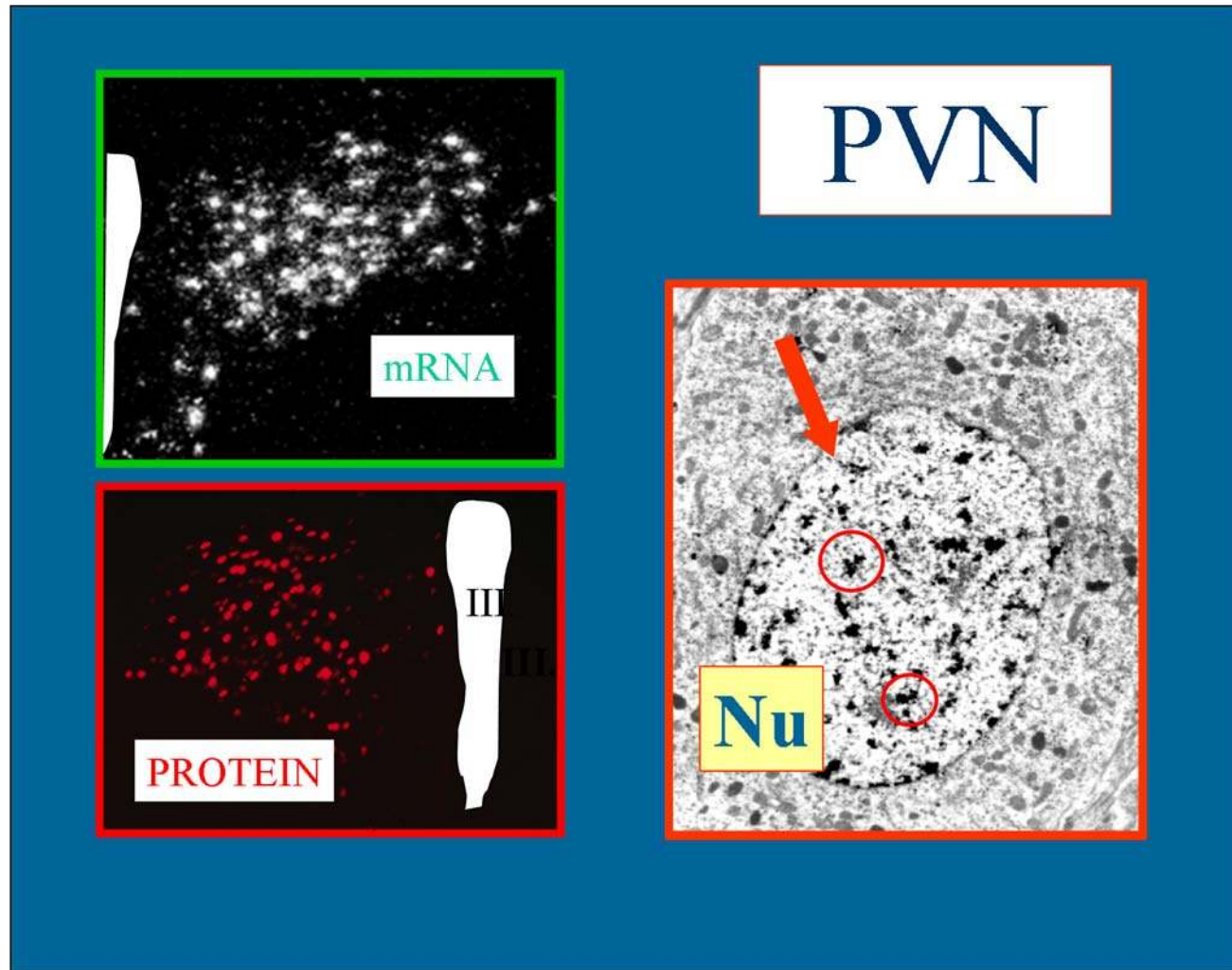
HOMODIMER



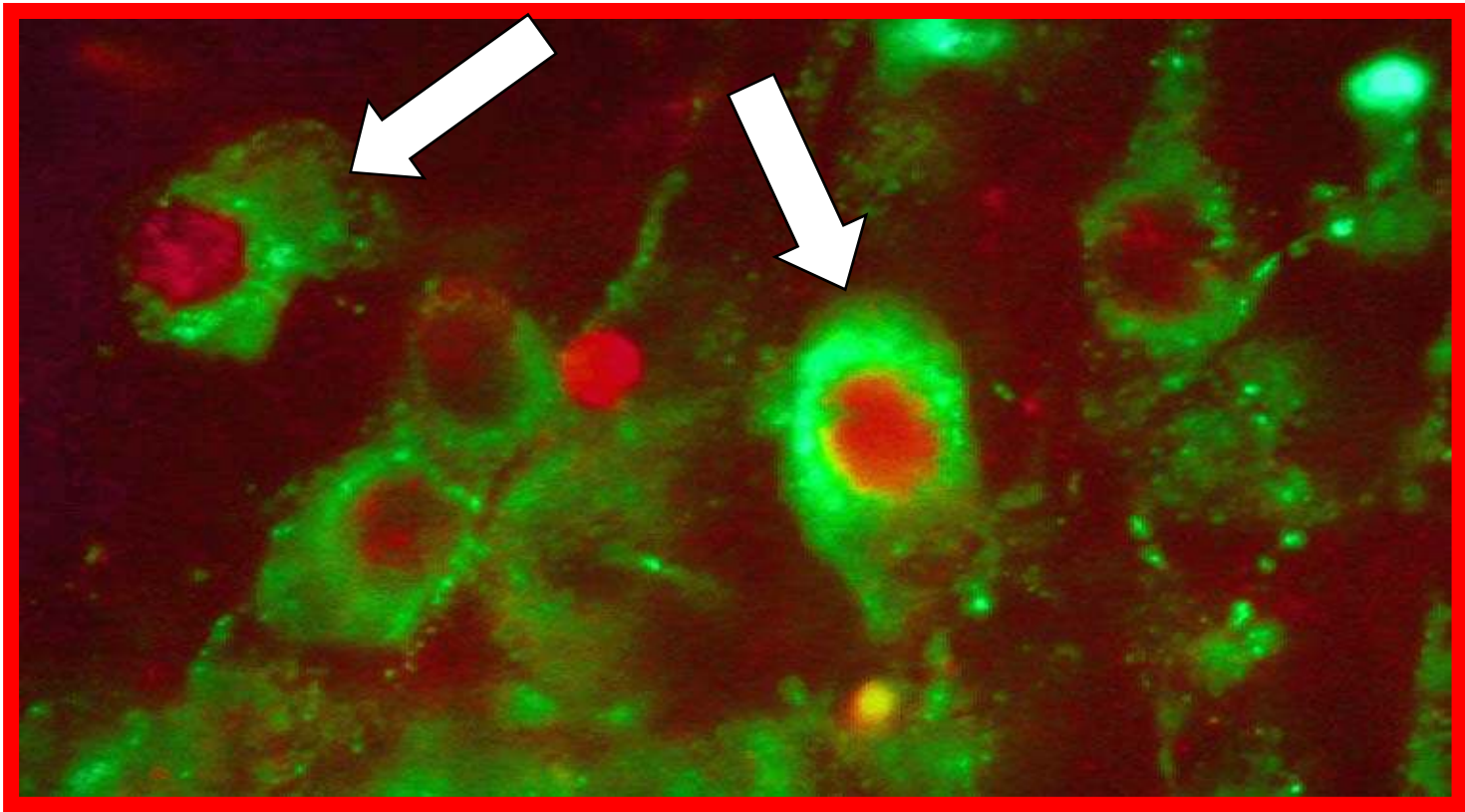
HETERODIMER

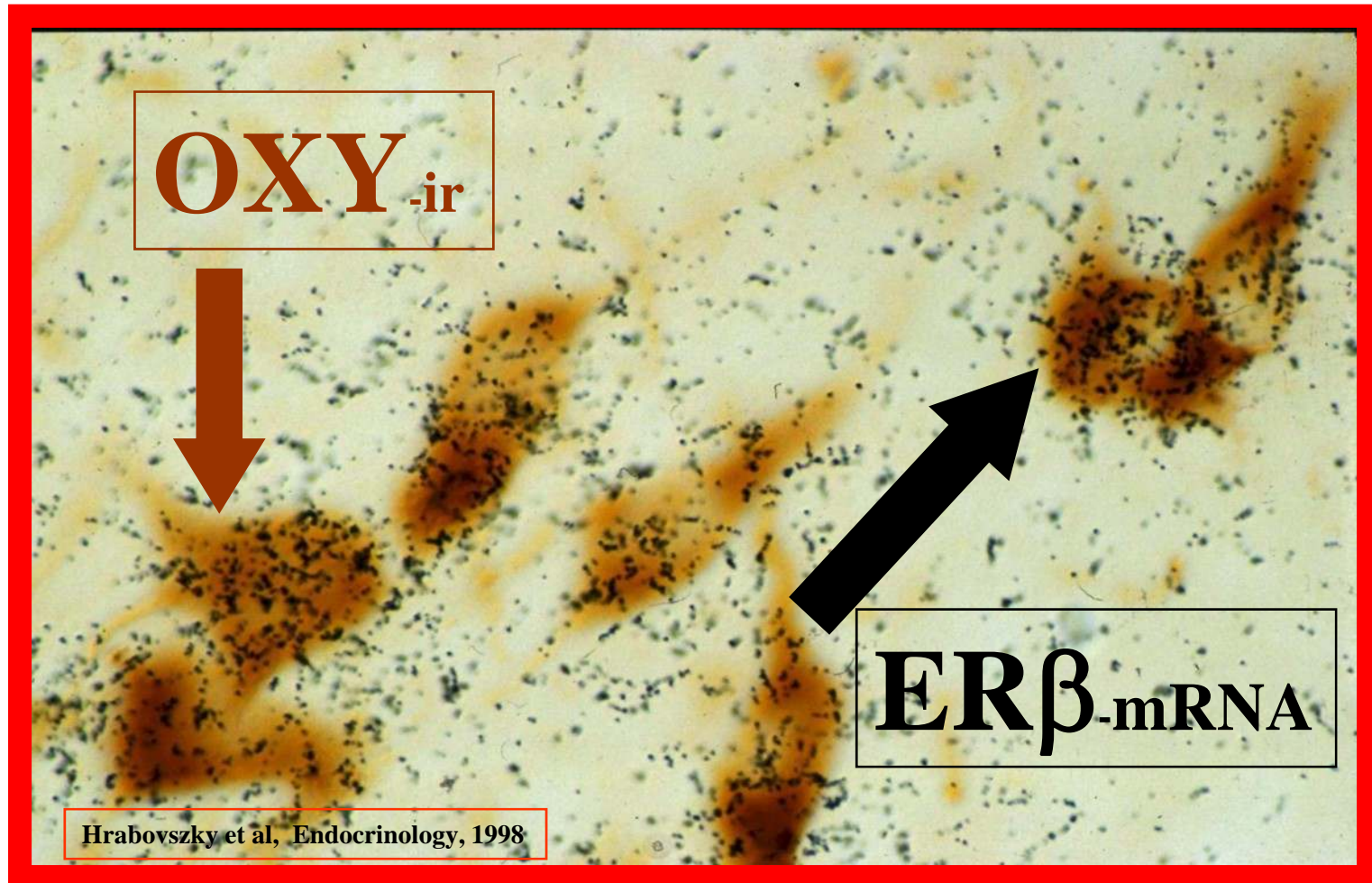


Forrás: Shughrue, P. et al., J. Comp. Neurology
388:507-525, 1997

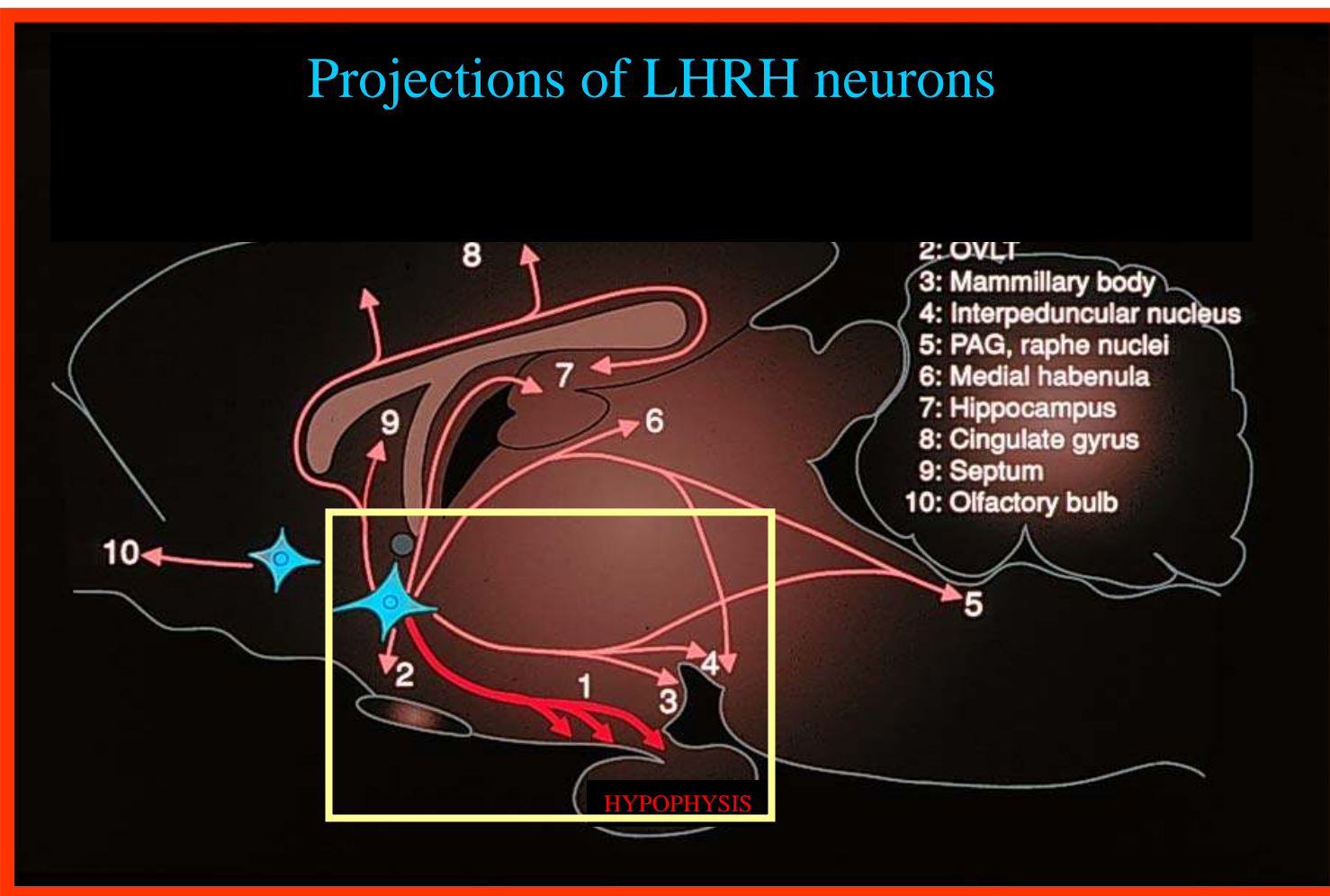


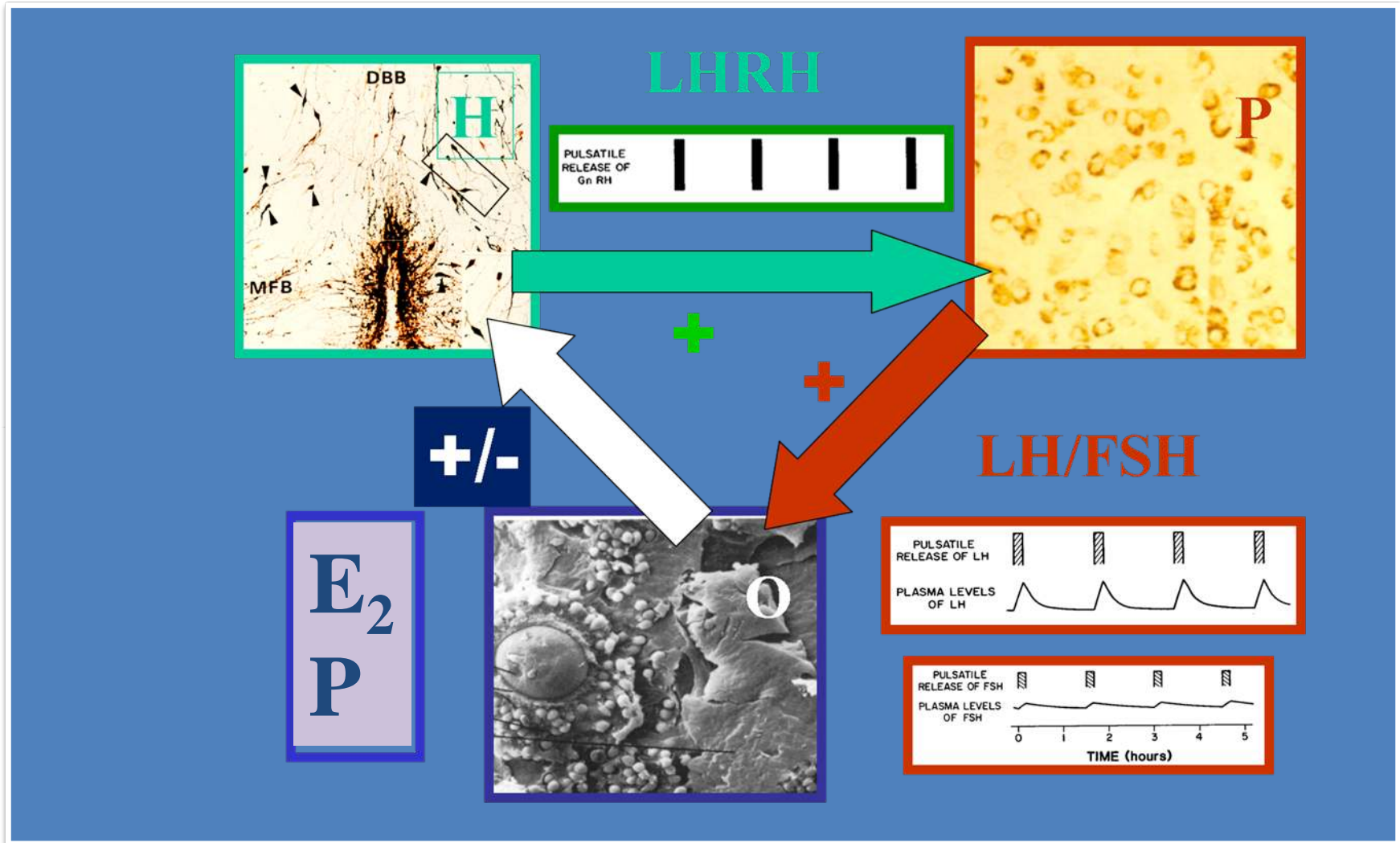
VASOPRESSIN-ER β

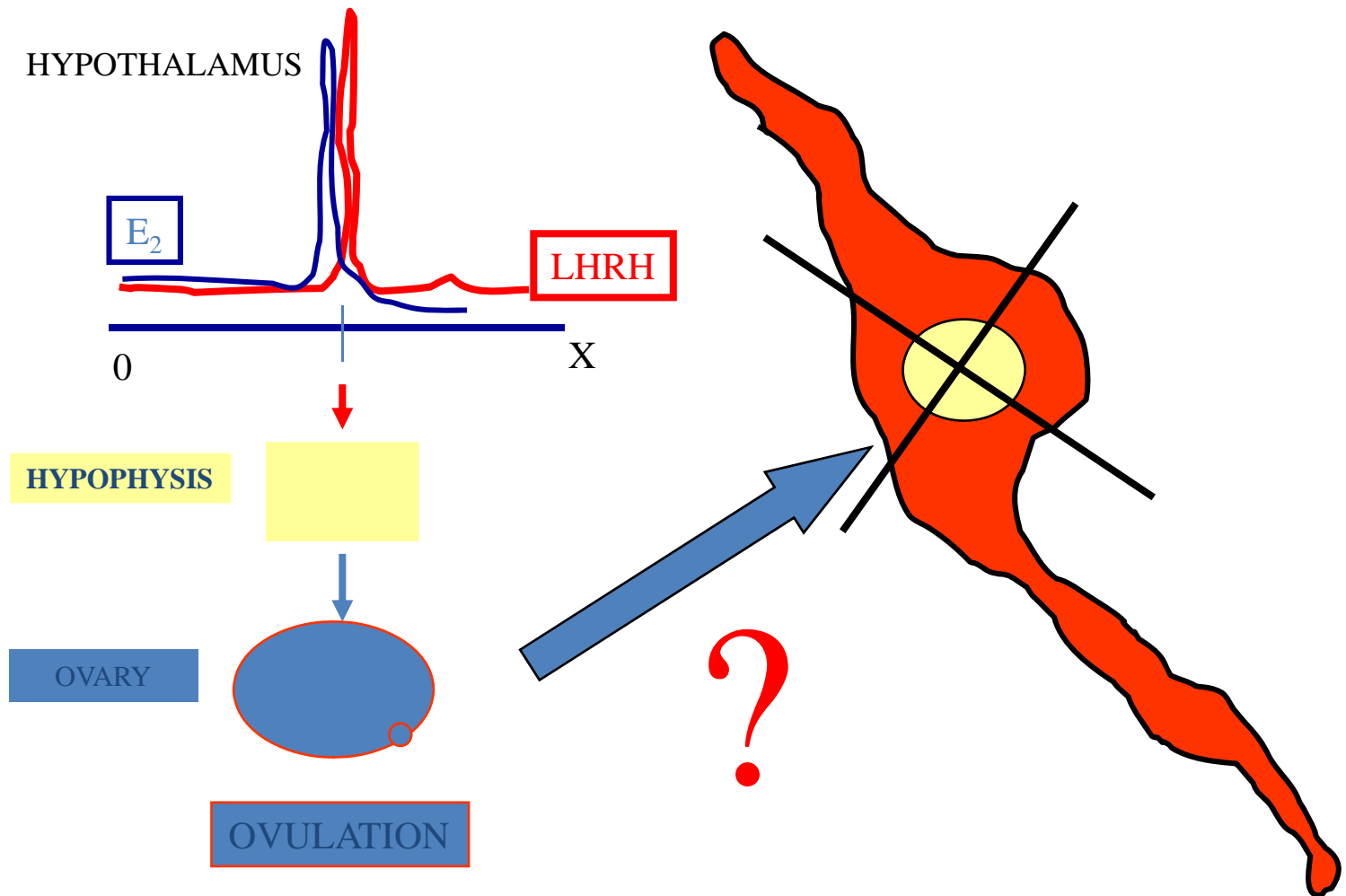




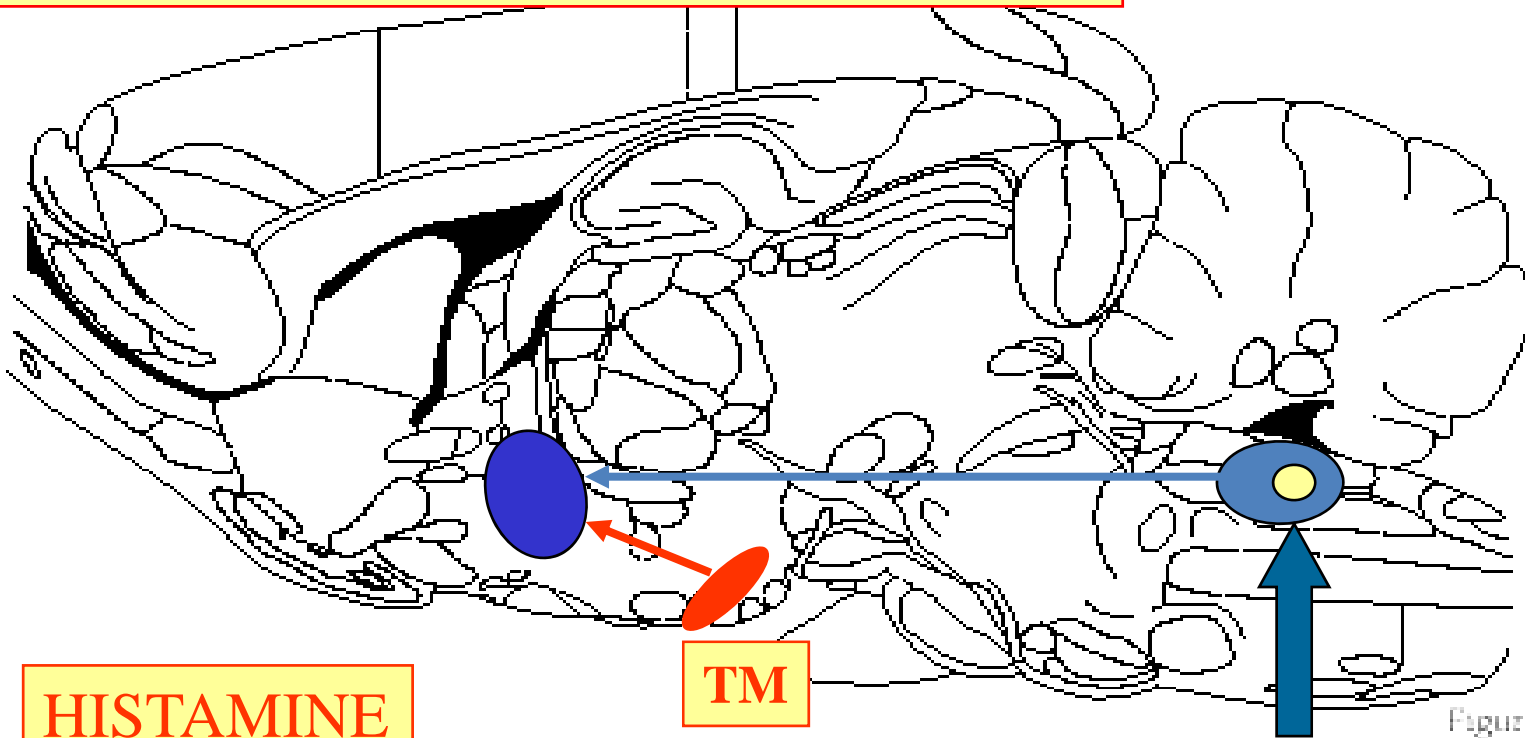
Projections of LHRH neurons

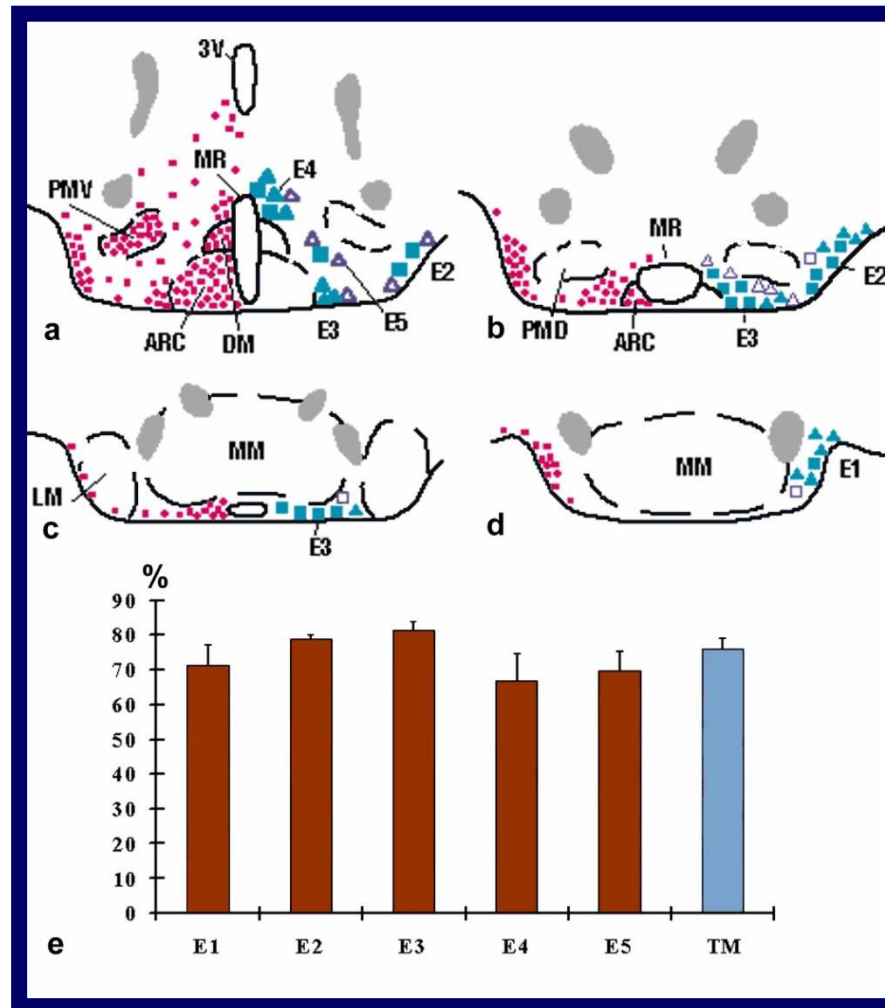


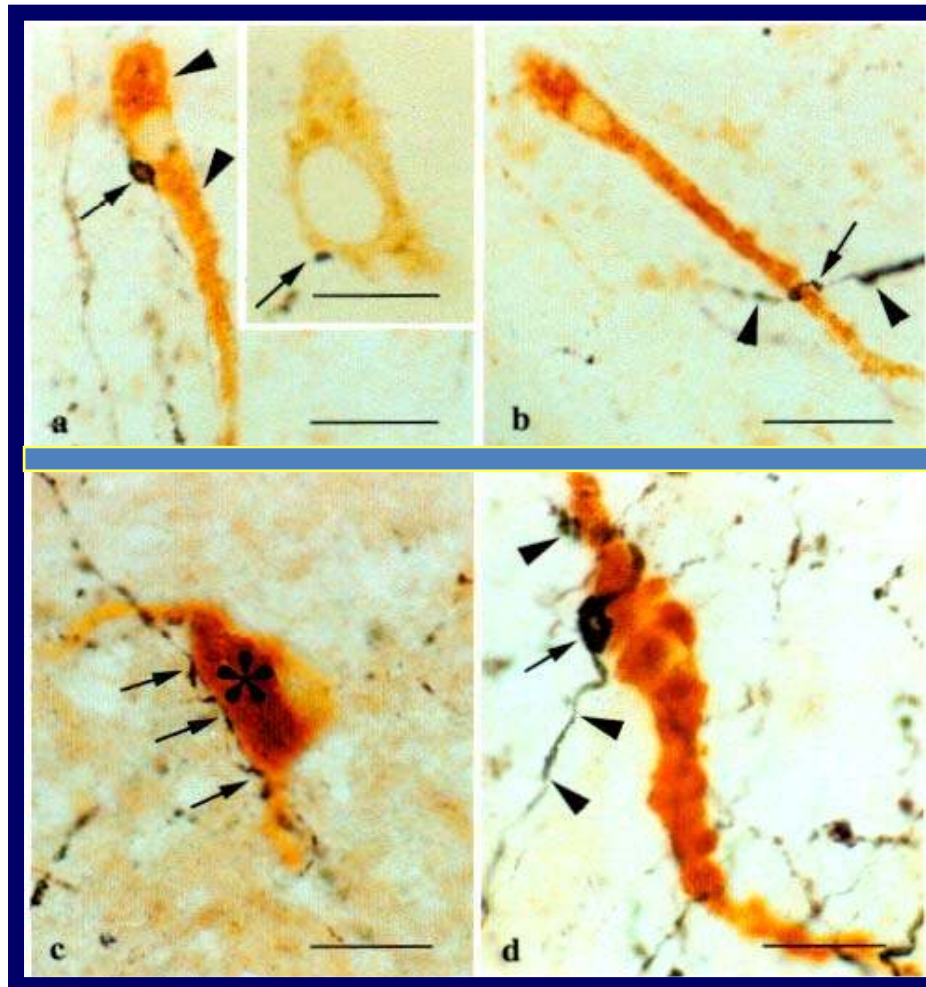




INDIRECT REGULATION







RAT

Human

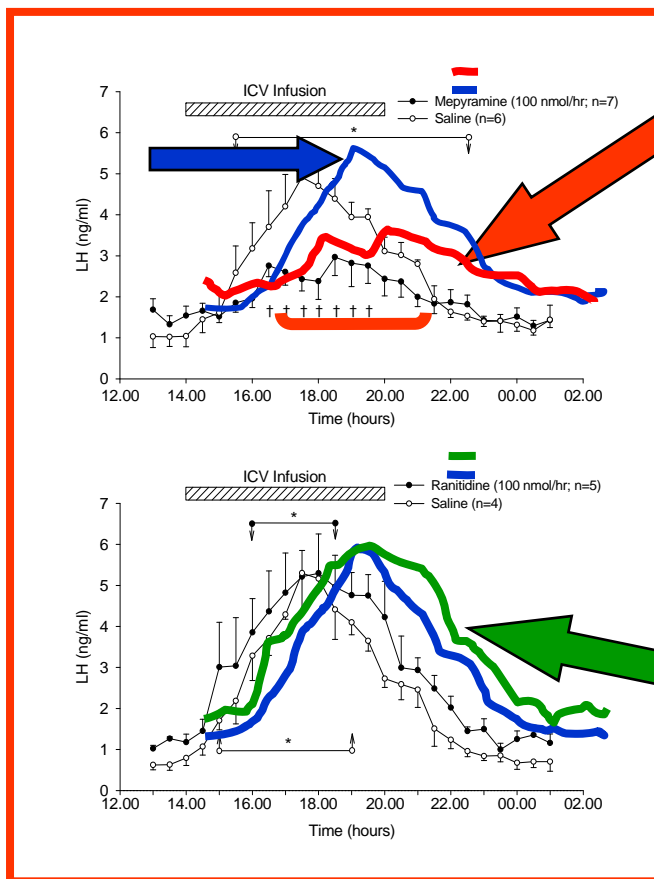
Ethical permit: No. 372

Fekete et al,
Endocrinology, 1999

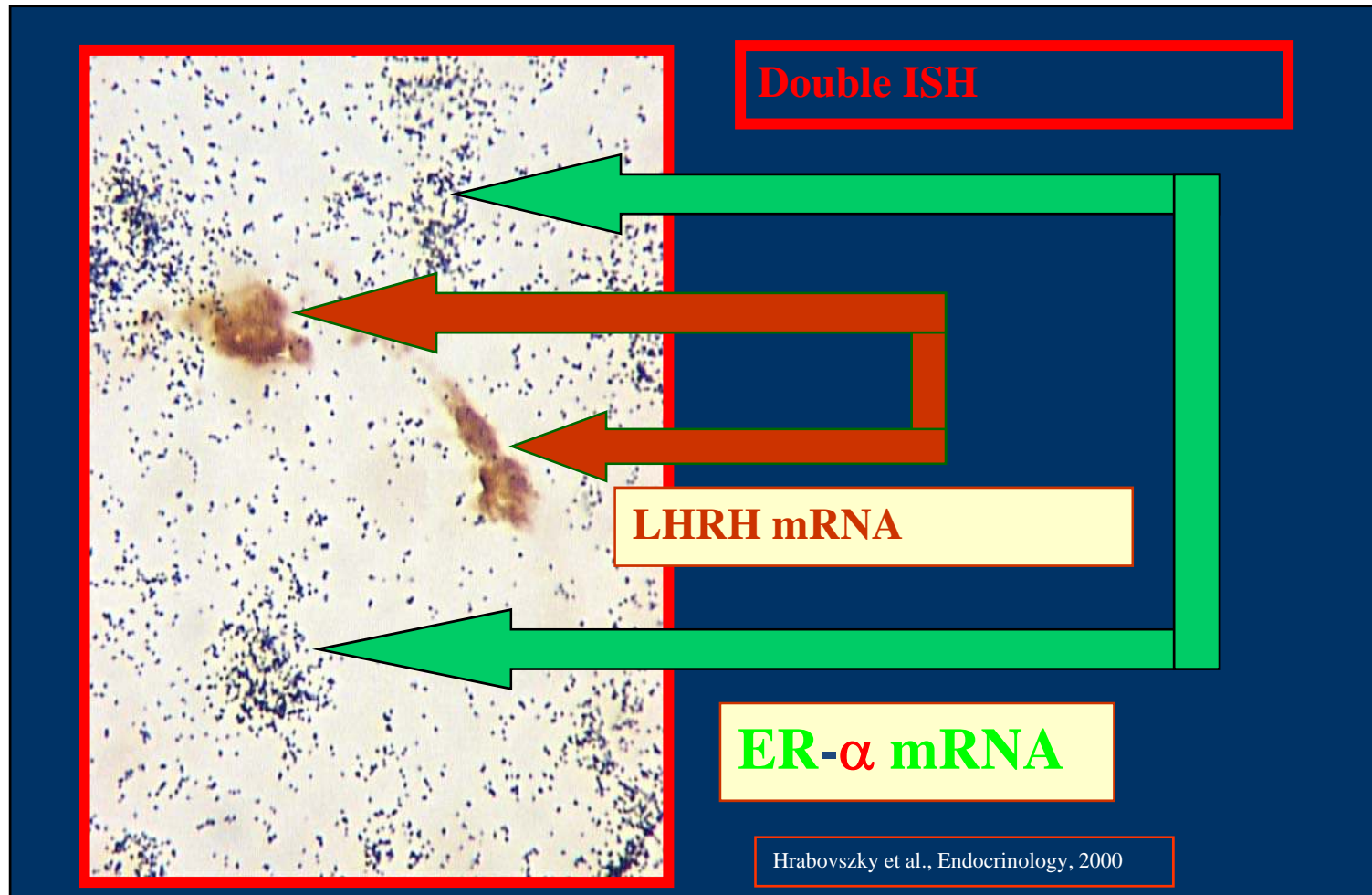
MEPYRAMINE



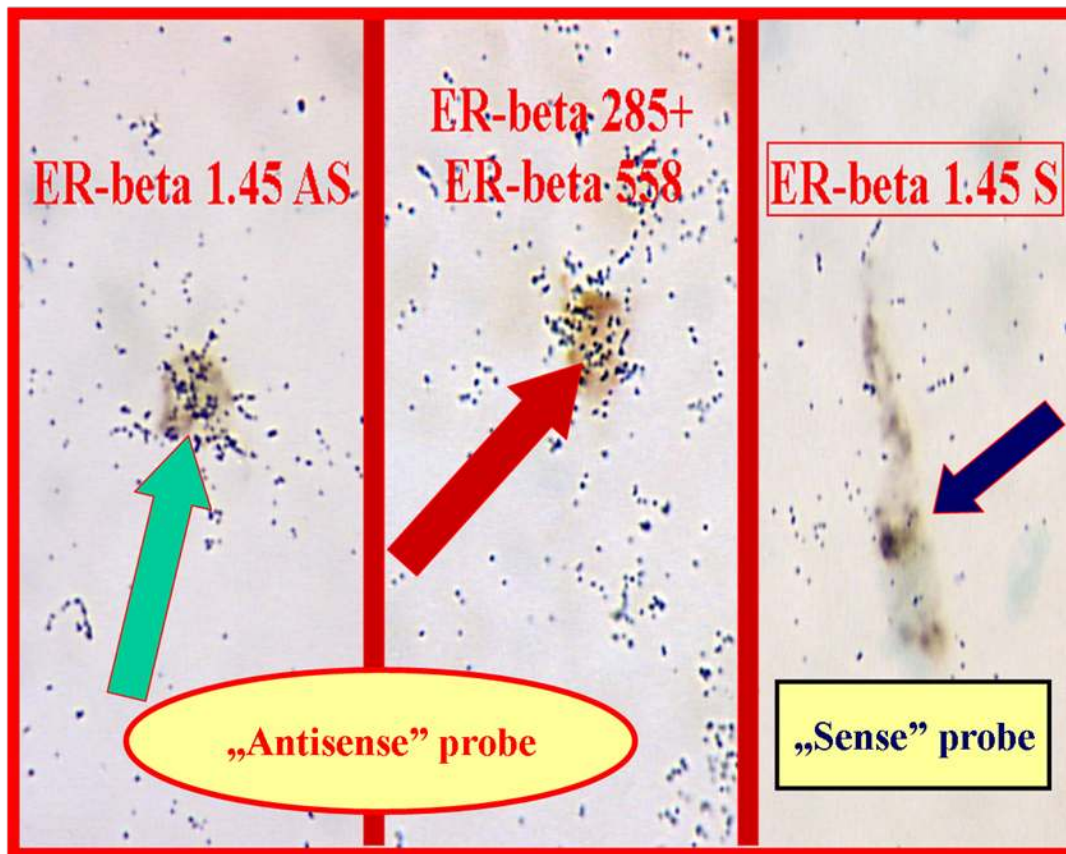
Effects of
H receptor
antagonists on
LH release



RANITIDINE

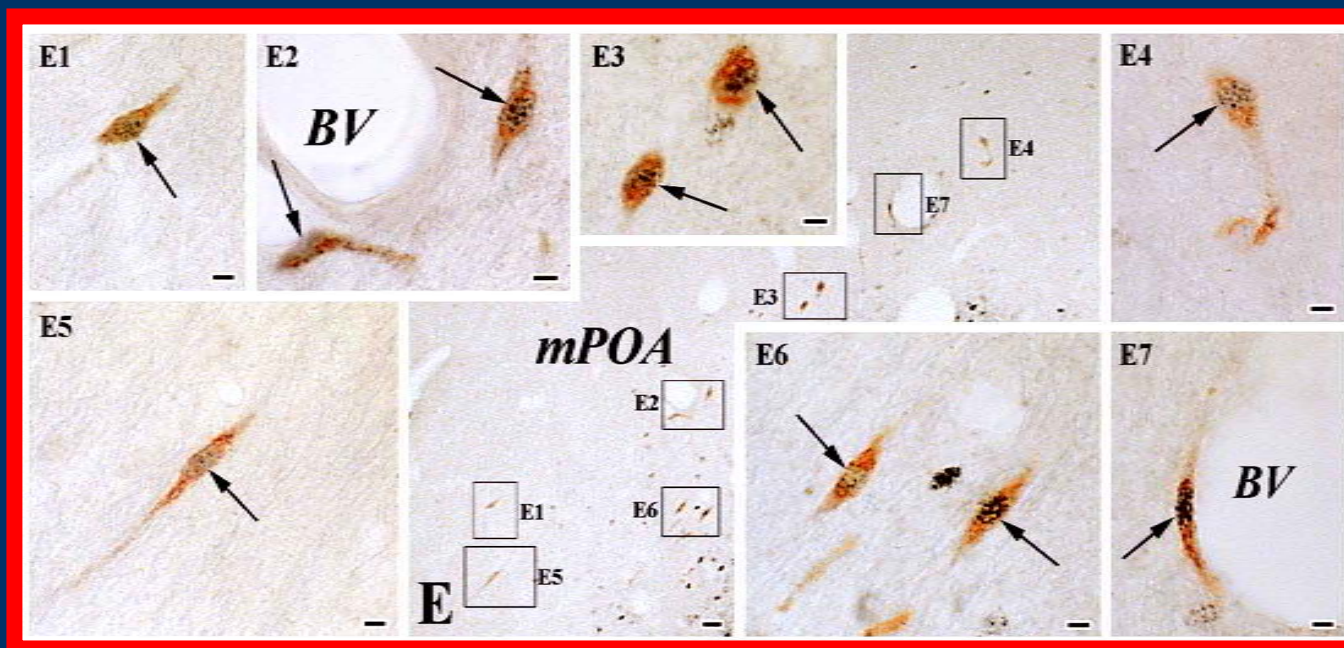


ER- β mRNA expression in LHRH neurons



Hrabovszky et al, Endocrinology, 2000

ER β protein expression in LHRH neurons



Hrabovszky et al., Endocrinology, 2001

