PLEASE HAND IN

UNIVERSITY OF TORONTO
Faculty of Arts and Science

DECEMBER 2007 EXAMINATIONS

CSB 325H1F

Duration – 2 hours

No Aids Allowed

Name: _____

Student Number: _____

Please answer all questions on the scantron sheet. Please write in pencil.
There are 60 multiple choice questions. Each question is worth 1 Mark. Total of 60 marks. Read questions carefully before answering. Please fill in the correct answer on the scantron sheet. There are 11 pages in this examination. After completion please place the scantron sheet inside the exam paper and return both.

1. Thyroid hormones are produced by:
   a) thyroglobulin conjugation
   b) iodination of free tyrosines
   c) iodination of thyroglobulin
   d) lysosomal peroxidation
   e) extracellular iodination of T3

2. Thyroid hormone receptors without ligands can act as
   a) gene repressors
   b) steroids
   c) GPCRs
   d) gene activators
   e) binding elements

hydrophobic therefore can bind TF to increase/ decrease gene expression across all tissue types

3. Paraventricular nucleus produces:
   a) TRH
   b) ACTH
   c) Prolactin
   d) NPY
   e) orexins

4. CRF can stimulate:
   a) thyrotropes
   b) somatotropes
   c) lactotropes
   d) somatolactotropes
   e) gonadotropes

CRF can stimulate both thyrotropes and corticotropes (+ reciprocal feedback)

5. Melanin concentrating hormone is:
   a) weight reducing hormone
   b) hormone secreted from paraventricular nucleus
   c) weight increasing hormone
   d) orexigenic hormone

6. NPY secretion from the arcuate nucleus stimulate:
   a) CRF
   b) Galanin
   c) Orexins
   d) Perception and orientation
   e) dopamine

inhibits CRF

- stimulates dopamine as possible cure with stress/depression/ anxiety
--> trying to develop this as a drug

7. Leptin:
   a) is not secreted from adipocytes
   b) does not stimulate sympathetic activity
   c) does not stimulate norepinephrine
   d) is not anorexigenic
   e) is not orexigenic

ABC are incorrect
--> stimulates sympathetic activity to release NE and is also secreted from adipocytes
We didn't learn this but, anorexigenic--> appetite surpressent
therefore it IS this and thus d) is incorrect
e) orexigenic--> appetite stimulant

8. Cortisol inhibits the transcription of:
   a) glycogen synthetase
   b) phosphoenolpyruvate carboxykinase
   c) thyroxine
   d) POMC

precursor for ACTH and it's a negative feedback system to inhibit cortisol

increases glycogen synthetase by converting glucose to glycogen in the liver
I don't think glycolysis continues, just gluconeogenesis so I am GUESSING b)
--> T4 wouldn't be inhibited because these systems are complimentary with HPA and HPT axis both stimulated when stressed and CRH and TRH also positive reciprocal feedbackk
--> POMC is the precurosor for ACTH

9. Mammalian Sertoli cells secrete:
   a) activin and inhibin
   b) FSH, LH and estradiol
   c) testosterone and activin
   d) testosterone and inhibin
   e) estradiol and inhibin

10. Metabolites of testosterone are
   a) epitestosterone
   b) estrone and estradiol
   c) dehyroepiandrosterone, estrone, dihydroxytestosterone
   d) androstenedione, estradiol, dihydroxytestosterone

11. If there is lack of dihydroxytestosterone, which systems would you expect to be affected:
    a) epididymus and brain
    b) scrotum, voice, prostate
    c) beard
    d) hair and skin
    e) vas deferens and penis

12. Progesterone is not:
    a) influenced by FSH, LH
    b) secreted by placenta
    c) secreted by corpus luteum
    d) converted from androstenedione
    e) produced by adrenal cortex

13. Actions of prolactin on the follicle and corpus luteum include:
    a) inhibition of estradiol synthesis and inhibition of progesterone synthesis, respectively
    b) inhibition of estradiol synthesis and maintenance of progesterone synthesis, respectively
    c) maintenance of estradiol synthesis and maintenance of progesterone synthesis, respectively
    d) maintenance of estradiol synthesis and inhibition of progesterone synthesis, respectively
    e) inhibition of estradiol synthesis and inhibition of inhibit secretion, respectively

14. During puberty GnRH secretion is caused by:
    a) Increase in TNF, NPY, glutamate and leptin
    b) Decrease in leptin, increase in glutamate and decrease in GABA didnt learn this
    c) Increase in leptin and glutamate and decrease in GABA
    d) Increase in GABA, glutamate and NPY
    e) None of the above

15. During the follicular phase of the menstrual cycle,
    a) estradiol has a facilitatory action on GnRH neurons
    b) estradiol has an inhibitory action on GnRH neurons
    c) prolactin is actively inhibiting GnRH neurons
    d) prolactin is being actively released by the adenohypophysis
    e) progesterone has a facilitatory action on GnRH neurons

estrodiol is positively feedback on GnRH during follicular phase

16. Arousal and learning are activated by sympathetic nervous system stimulation through:

a) nucleus of solitary tract to adrenal medulla releasing epinephrine
b) locus coeruleus affecting adrenal medulla to release norepinephrine
c) amygdala releasing norepinephrine to improve memory
d) area postrema sensing epinephrine and activating adrenal medulla
e) area postrema sensing epinephrine and activating locus coeruleus

area postrema--> vomitting centre

locus coreleus

17. Maternal care reduces anxiety through upregulation of glucocorticoid receptors because:

a) upregulation of glucocorticoid receptors results in increased HPA activity
b) upregulation of glucocorticoid receptors results in decreased HPA activity
c) upregulation of glucocorticoid receptors results in more CRF secretion
d) upregulation of glucocorticoid receptors results in hippocampal inhibition
e) upregulation of glucocorticoid receptors results in grooming

glucocorticoids--> cortisol
increase in receptors = decrease HPA activity needed to generate same response?
Therefore reduce anxiety?

18. Parental behaviors are regulated by:

a) sexually dimorphic brain areas
b) hormones secreted by posterior pituitary
c) hormones secreted by SON
d) adrenal medulla hormones

19. C21 steroid release by female goldfish signals to:

a) upregulate male estrogen receptors
b) male gonadotropin release from vomeronasal organ
c) male gonadotropin release from anterior pituitary
d) females to release C19 steroids

20. Tsetse flies are attracted to chemicals released by antelopes is an example of:

a) pheromones
b) synomones
c) allomones
d) kairomones
e) none of the above

these are all alleochemicals

--> antelopes and flies are different species so can't be pheremones because that's within a species

21. Urocortin I and urotensin are:

a) paralogues
b) orthologues
c) corticotropins
d) receptors
e) nore of the above

Urocortin in birds/mammals, sauvagine in frogs and utrotensin I in teleosts/holosteans

--> species diverage therefore orthologues

22. Urocortin I and Urocortin II in mice are :
    a) paralogues
    b) orthologues
    c) corticotropins
    d) receptors

functionally different because of gene divergance

23. In fish urotensin I can be released from
    a) medial longitudinal fasciculus only
    b) Edinger-Westphal nucleus only
    c) Urophysis only
    d) medial longitudinal fasciculus and urophysis
    e) Edinger-Westphal nucleus and urophysis

both brain and urophysis

24. Signaling through CRF receptor 1 induces:
    a) sex steroids
    b) IGF-1
    c) anxiety
    d) glycogenolysis
    e) anxiolysis

25. Adrenal cortex cells have receptors:
    a) POMC
    b) CRF
    c) MC1
    d) MC2

should have ACTH receptors which is cleaved from the POMC.
It's not CRF because that acts on pars distalis
MC1--> melanocortin receptor (includes ACTH and MSH)
MC-2 associated with ACTH....
BUT WE DID NOT LEARN THIS, RIGHT?

26. In the arctic hare the change into a summer coat can be regulated by:
    a) insulin
    b) leptin
    c) NPY
    d) MCH
    e) none of the above

27. The release of MSH from pars intermedia is stimulated by
    a) CRF in response to light
    b) NPY in response to light
    c) CRF and TRH in response to light
    d) CRF and TRH in response to dark
    e) none of the above

we didn't learn this either?
but must be in response to light and it's from the POMC pro-hormone

28. Beta-endorphin:

a) acts on the opioid receptors to decrease dopaminergic neurotransmission to the lactotropes

b) acts on the opioid receptors to increase dopaminergic neurotransmission to the lactotropes

c) acts on the opioid receptors to increase dopaminergic neurotransmission to the gonadotropes

d) acts on the opioid receptors to decrease dopaminergic neurotransmission to the corticotropes

decrease stress when you workout---> release endorphin--> inhibit cortiocotropes from releasing ACTH---> decrease corisol (inhibit HPA axis)

29. The main hormone secreted by corpus luteum is:

a) Progesterone
b) Estradiol
c) Androstenedione
d) FSH
e) LH

does this question even make sense? vasopressin is a hormone it doesn't release anything? maybe it's trying to ask wht the ant. pit does release? ACTH is released by pars distalis so that is a possible answer
prolactin--> anterior pituitary as well
TRH --> from PVN
but TRH can increase prolactin...

30. In the anterior pituitary vasopressin releases:

a) prolactin
b) TRH
c) ACTH
d) none as it is not found in the pituitary portal system

vasopressin + CRF or CRF + oxytocin in the PVN ----> releases ACTH from anterior pituitary

31. Light input from the retina will stimulate:

a) NPY, dopamine, GABA, MSH
b) NPY, epinephrine, glutamate, MSH
c) CRF, TRH, MSH
d) NPY, dopamine, GABA

32. In Xenopus, pesticide methoxychlor can:

a) increase vasotocin
b) decrease vasotocin
c) increase vasopressin
d) increase prolactin

?

33. The nervous system is absent in

a) Radiates
b) Agnathans
c) Poriferans
d) Deuterostomes

not in sponges
nerve net started with bilaterial animals
--> radiates, dueterostomes, agnathans (protosomia)

34. Neuropeptide NPY:
a) only enters the brain through the circumventricular organs
b) does not need to ever leave the brain as it is made and used there
c) freely goes through the blood brain barrier
d) needs to be transported into and out of the brain

35. Chondrichthyan pituitary glands have:
a) neurointermediate lobe, portal system and buccal or ventral lobe
b) combined neurointermediate lobe and pars distalis, portal system.
c) neurointermediate lobe and a portal system
d) direct neural connection between hyphothalamus and anterior pituitary

36. Urodele pituitary glands, in comparison to mammalian pituitary glands have:
a) greater portal system
b) less developed pars intermedia
c) more developed pars intermedia
d) more lobular pars nervosa

I'm guessing mammals have developed the complete pars nervosa vs. amphibians still had some indigitation with the intermedia

37. Dopamine beta-hydroxylase is found in:
a) brain only
b) adrenal cortex only
c) gonads only
d) sympathetic ganglia and adrenal cortex

converts dopamine to NE
PNMT used to convert NE to Epi

38. Norepinephrine receptors are:
a) G-protein coupled receptors, adrenergic
b) G-protein coupled receptors, muscarinic
c) Ion channels, beta-type
d) Ion channels, inhibitory

39. Ligands for GPCR can be:
a) peptide hormones
b) ionic calcium
c) monoamines
d) all of the above
e) G proteins

i.e. opsins

40. The function of the G apha subunit is to:
a) act as a secondary messenger
b) transduct signal to GPCR
c) transduct signal to the pathway effectors
d) bind PKC
e) release calcium

41. Smad signal transducers are used by the ligand signaling of:
a) ANP
b) estrogen
c) inhibin ?
d) insulin
e) prolactin

42. Dehydration induces:
a) angiotensinogen release
b) ANP release
c) rennin processing
d) angiotensin I processing
e) vasopressin processing

43. Deficiency in vasopressin could result in:
a) antidiuresis
b) diuresis
c) increased plasma sodium
d) decreased plasma sodium
e) none of the above

44. In the brain ANP:
a) releases vasopressin
b) inhibits rennin secretion kidney
c) inhibits vasopressin release
d) inhibits aldosterone synthesis synthesized in adrenal cortex
e) all of the above

45. POMC is secreted by:
a) adrenal cortex cells
b) corticotropes
c) PVN cells
d) none of the above
e) all of the above

cortisol

46. Increased activation of the glucocorticoid receptor signaling does not cause:
a) hyperglycemia
b) lipolysis
c) protein synthesis
d) immunocompromised state protein catabolism
e) bone loss

47. ACTH is not released in response to:
a) CRF
b) Oxytocin
c) Vasopressin
d) TRH
e) TSH

TRH released from PVN as well as CRF and they have reciprocal postiive feedback
vs. TSH is released from pars distalis to stimulate the thyroid

48. Provide the best sequential description of the stress axis activation
a) norepinephrine, epinephrine, ACTH, corticosteroids, metabolism
b) ACTH, norepinephrine, epinephrine, corticosteroids, metabolism
c) Corticosteroids, metabolism, ACTH, norepinephrine, epinephrine
d) Corticosteroids, metabolism, ACTH, norepinephrine, epinephrine happen simultaneously

short-term then long term

49. Suprachiasmatic nucleus cells do not have receptors for:
a) 5HT
b) NPY
c) GABA
d) vasopressin
e) PACAP

I don't know about serotonin and GABA

but it does for vasopressin
PACAP/ GH no idea
NPY?

50. Vasopressin receptor activation in the pineal gland stimulates:
a) melatonin transporter
b) melatonin receptor
c) hydroxyl-indole-O-methyl transferase
d) tyrosine hydroxylase
e) dopamine

except we didn't learn this...

51. Melatonin does not:
a) cross the membranes
b) bind to a GPCR
c) scavenge free oxygen radicals
d) use voltage gated ion channels
e) use retinoid-related nuclear receptor

52. Relative to serotonin, what chemical changes make melatonin lipophilic
a) blocked hydroxyl and amino groups
b) extra amino group
c) blocked tyrosine hydroxyl group
d) none, they are both lipophilic

53. IGF-1 receptors are found in:
a) extracellular matrix
b) only in liver
c) most cell membranes
d) osteoclast precursors
e) cartilage

basically like insulin

54. Sitting and watching a TV show may stimulate
a) thyroid hormone
b) cholecystokinin
c) aldosterone
d) PTH
e) NPY

preserve your water?

increase oxygen consumption when you're not doing anything like sleeping

55. Lipogenesis is not stimulated by
a) glucagon like peptide
b) gastric inhibitory peptide
c) leptin
d) orexins
e) GH

56. The adrenal gland does not produce
a) estradiol
b) aldosterone
c) testosterone
d) epinephrine
e) ACTH

57. Osteolysis is stimulated by:
a) estrogen
b) calcitonin
c) IGF1
d) Triiodothyronine
e) testosterone

break down bone --> part of cortisol effects-- increase IGF-1

thyroid hormones increase growth so many break down bone first then rebuild??

58. Osteoclasts are stimulated by:
a) estrogen
b) calcitonin
c) thyroxin
d) PTH
e) none of the above

59. 1, 25 dihydroxycholecalciferol:

a) acts as a transcription factor
b) is regulated by plasma prolactin
c) binds Ca2+ transporters
d) regulates osteoclasts
e) found in the skin

skin, bones and brain?
--> vitamin D helps skin so
makes sense

60. The aggressive behaviour of the female spotted hyena has been attributed to

a) excess production of androstenedione
b) a lack of estradiol
c) excess production of dihydroxytestosterone
d) a lack of progesterone
e) b and d, only
f) not understanding a thing in CSB325 lectures