

## MCQ exam

Mark your answers on the answer sheet (page 2 of the second document)

**1. In patients with major depression, a decreased sensitivity of glucocorticoid receptors was supported by:**

- a) a higher decrease in plasma levels of ACTH in response to dexamethasone, as compared to normal healthy subjects
- b) a higher decrease in plasma levels of cortisol in response to dexamethasone, as compared to normal healthy subjects
- c) a lower decrease in plasma levels of ACTH in response to dexamethasone, as compared to normal healthy subjects
- d) a lower decrease in plasma levels of cortisol in response to dexamethasone, as compared to normal healthy subjects
- e) a less pronounced impairment of memory function in response to hydrocortisone, as compared to normal healthy subjects

**2. A forebrain overexpression of mineralocorticoid receptors in rodent animal models is associated with:**

- a) increased anxiety levels in response to stress
- b) decreased anxiety levels in response to stress
- c) increased corticosterone response to stress
- d) decreased corticosterone response to stress
- e) decreased glucocorticoid receptor function in hippocampus

**3. In patients with major depression, dexamethasone causes:**

- a) a more pronounced inhibition of T-cell proliferation in response to PHA
- b) a less pronounced inhibition of T-cell proliferation in response to PHA
- c) a more pronounced inhibition of cytokine production in response to PHA
- d) a less pronounced inhibition of cytokine production in response to PHA
- e) a less pronounced inhibition of B-cell proliferation in response to PHA

**4. In patients with obsessive-compulsive disorder, functional neuroimaging studies have shown:**

- a) decreased functional activity within the orbitofrontal cortex, as compared to normal healthy subjects
- b) increased functional activity within the orbitofrontal cortex, as compared to normal healthy subjects
- c) increased functional activity within the caudate nucleus, as compared to normal healthy subjects
- d) increased functional activity within the thalamus, as compared to normal healthy subjects
- e) decreased functional activity within the amygdala, as compared to normal healthy subjects

**5. In patients with obsessive-compulsive disorder, psychological treatments such as cognitive-behavioral therapies have been found to:**

- a) reduce the functional activity within the orbitofrontal cortex
- b) reduce the functional activity within the anterior cingulate cortex
- c) increase the functional activity within the caudate nucleus
- d) increase the functional activity within the anterior cingulate cortex
- e) increase the functional activity within the orbitofrontal cortex

**6. In patients with obsessive-compulsive disorder, cognitive inflexibility was associated with:**

- a) a less marked activation within the caudate nucleus during specific challenging task, as compared to normal healthy subjects
- b) a less marked activation within the anterior cingulate cortex during specific challenging task, as compared to normal healthy subjects
- c) a more pronounced activation within the caudate nucleus during specific challenging task, as compared to normal healthy subjects
- d) a more pronounced activation within the anterior cingulate cortex during specific challenging task, as compared to normal healthy subjects
- e) a less marked activation within the dorsolateral prefrontal cortex during specific challenging task, as compared to normal healthy subjects

**7. The pathophysiology of Parkinson's disease can involve all these mechanisms except:**

- a) The loss of dopaminergic neurons of the pars compacta of substantia nigra
- b) The loss of dopamine fibers in the striatum
- c) The loss of glutamatergic neurons in the subthalamic nucleus
- d) The loss of GABA neurons of the globus pallidus
- e) The loss of serotonergic neurons of the raphe nucleus

**8. Among the following propositions, select the correct proposition(s). Parkinson's disease is characterized by:**

- a) Bradykinesia
- b) Essential tremor
- c) Tremor at rest
- d) Dyskinesias characterized by involuntary abnormal movements
- e) Myoclonus

**9. Among the following propositions, select the correct proposition(s):**

- a) L-Dopa induces a stable improvement of motor symptoms in all the stages of Parkinson's disease
- b) Deep brain stimulation of the subthalamic nucleus leads to an improvement of motor symptoms accompanied by dyskinesias
- c) Deep brain stimulation of the subthalamic nucleus improves the motor symptoms by inhibiting the majority of subthalamic neurons
- d) Deep brain stimulation of the subthalamic nucleus increases the tissue level of glutamate in the pars reticulata of substantia nigra of 6-OHDA rats
- e) Deep brain stimulation of the subthalamic nucleus increases the tissue level of GABA in the pars reticulata of substantia nigra of 6-OHDA rats

**10. Among the following propositions, select the correct proposition(s):**

- a) In the striatum, dopamine D1 receptors are located on the projection neurons of the indirect pathway
- b) Dopamine D2 receptors of the striatum are located on the projection neurons of the direct pathway
- c) Activation of dopamine D1 receptors exerts an excitatory effect on striatal projection neurons
- d) Activation of dopamine D2 receptors exerts an excitatory effect on striatal projection neurons
- e) The D1 and D5 receptors belong to the same family of dopaminergic receptors

**11. Among the following propositions, select the correct proposition(s):**

- a) Dopamine neurons of the pars compacta of substantia nigra project exclusively on the striatum
- b) Dopamine depletion into the subthalamic nucleus activates D2 receptors to maintain the tonic neuronal firing
- c) Dopamine D5 receptors are characterized by constitutive activity, which is at the origin of the bursty activity in the subthalamic nucleus in the 6-OHDA rat model of Parkinson's disease
- d) Local injection of D5 receptor agonist into the subthalamic nucleus changed bursty activity to a tonic activity in the 6-OHDA rat model of Parkinson's disease
- e) Local injection of D5 receptor agonist into the subthalamic nucleus can be proposed as a target in the treatment of Parkinson's disease

**12. Among the following propositions, select the correct proposition(s):**

- a) The internal part of the globus pallidus is the exclusive output structure of the basal ganglia
- b) The subthalamic nucleus sends glutamatergic projections to the output structures of the basal ganglia
- c) The external part of the globus pallidus is one of the input structures of the basal ganglia
- d) Tonic oscillatory activity of subthalamic nucleus neurons is the pathological signature in animal models of Parkinson's disease as well as in parkinsonian patients
- e) Deep brain stimulation of the subthalamic nucleus improves severe depression in parkinsonian patients

**13. The plasma half-life of levodopa is**

- a) 15-30 min
- b) 1 – 1.5 h
- c) 3 – 5 h
- d) 5 – 8 h
- e) 10 – 15 h

**14. Rasagiline is**

- a) A selective dopamine D3 receptor antagonist
- b) A reversible monoamine oxidase-B (MAO-B) inhibitor
- c) A serotonin reuptake inhibitor
- d) A reversible MAO-A and MAO-B inhibitor
- e) An irreversible MAO-B inhibitor

**15. Which of the following statements about monoamine oxidase (MAO) enzyme distribution is (are) false?**

- a) MAO-B are highly represented in the brain
- b) MAO-A are highly represented in the brain
- c) MAO-A are highly represented in the gastrointestinal tract
- d) MAO-B are highly represented in blood platelets
- e) MAO-A are present in the liver

**16. Which of the following statements concerning the Catechol-O-methyltransferase (COMT) enzyme is (are) false?**

- a) COMT participate in the metabolism of levodopa and dopamine
- b) COMT degrade dopamine into 3-O-methyldopa
- c) COMT degrade levodopa into 3-O-methyldopa
- d) 3-O-methyldopa facilitates the transfer of levodopa across the blood brain barrier
- e) Selegiline is a selective COMT inhibitor

**17. Which of the following statements concerning Saffinamide is (are) true?  
Saffinamide**

- a) Is a selective and reversible MAO-B and DA reuptake inhibitor
- b) Is a selective and irreversible MAO-B and DA reuptake inhibitor
- c) Exerts a state-dependent blockade of voltage-dependent Na<sup>+</sup> channels
- d) Increases glutamate release
- e) Its antidyskinetic effects could be attributed to non-dopaminergic mechanisms related to decreased glutamate release

**18. The orbitofrontal cortex is involved**

- a) in motivational aspects of behavior
- b) in socialization
- c) in cognitive flexibility
- d) in perseveration
- e) behavioral disinhibition when it is lesioned

**19. The prefrontal cortex encompasses different regions :**

- a) A dorsolateral region
- b) A temporal region
- c) An orbitofrontal region
- d) A cingulate region
- e) A premotor region

**20. Working memory involves:**

- a) A phonological loop
- b) A visual sketchpad
- c) Hippocampal information processing
- d) The occipital cortex
- e) A central executive system

**21. The anterior cingulate cortex**

- a) Has a cognitive and an affective part
- b) Plays a role in explicit memory
- c) Its lesion could induce an akinetic-mutism syndrom.
- d) Plays a role in attentional processes
- e) Is involved in the pathophysiology of Tourette's syndrome

**22. The dorsolateral prefrontal cortex is concerned with tasks that require:**

- a) Long-term memory
- b) Short-term memory
- c) Procedural memory
- d) Consciousness of information processing
- e) Neural mechanisms of praxis

**23. Which edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) by the American Psychiatric Association got an unexpected worldwide influence at the beginning of the 1980's?**

- a) DSM-II
- b) DSM-III
- c) DSM-III-R
- d) DSM-IV
- e) DSM-5

**24. Who was David Rosenhan (1929-2012)?**

- a) The chair of the DSM-IV task Force
- b) A psychiatrist who criticized the medicalization by the DSM of normal shyness
- c) The father of psychiatric epidemiology
- d) The author of a 1973 experiment in which eight pseudopatients were sent in several psychiatric institutions
- e) The author of *Asylums: Essays on the Social Situation of Mental Patients and Other Inmates* (1961)

**25. Which sentence is false?**

- a) A – Both DSM-III and DSM-IV methodologies rely on what can be called the “professor model”
- b) B – DSM-III was built on a fragile decision-making process
- c) C – DSM-III provided operational criteria for each mental disorder
- d) D – DSM-IV was not mainly funded by the pharmaceutical industry
- e) E – The majority of the experts involved in the revision of the DSM-5 are American psychiatrists

**26. Which claim is false concerning psychiatry in the USA during the 1970s?**

- a) There were deep ideological divisions amongst psychiatrists
- b) The inter-reliability of many psychiatric diagnoses was high
- c) The population in some mental asylums in the USA was over 5,000 people.
- d) Many clinicians were still influenced by psychoanalysis
- e) The American Psychiatric Association was involved in the standardization of classification systems

**27. Which sentence is false?**

- a) Homosexuality was officially removed from the DSM-II in 1973
- b) At the end of the 1960s, there was a growing negative feeling in the gay community towards psychiatrists
- c) Many psychiatrists in the 1970s thought that psychotherapy could be effective in order to “cure” homosexuality
- d) Homosexuality was still considered until 1992 in the DSM as a serious mental disorder
- e) In the 1960s, being homosexual was commonly seen inside the psychiatric institution as incompatible with being a psychiatrist

**28. Which sentence is true concerning the a-theoretical position in the DSM-III:**

- a) It is incompatible with the idea that mental disorders are brain disorders
- b) It is incompatible with the idea that some life events may cause mental disorders
- c) It relies on the lack of specificity of mental symptomatology
- d) It can be described as a “purely descriptive” and “neutral” approach with regard to etiology
- e) It relies on the consensus that all mental disorders are biological

**29. Attention Deficit Hyperactivity Disorder:**

- a) Is an homogeneous disorder
- b) Is associated with stereotyped behaviors
- c) Is characterized by inattention
- d) can be present during adulthood
- e) is only present during childhood

**30. Attention Deficit Hyperactivity Disorder:**

- a) Is a neurodevelopmental disorder
- b) Is always a genetic disorder
- c) Is always determined by the environment
- d) Results from the combination of genetic and environmental factors
- e) Is a social construct

**31. The following comorbidities can associate with Attention Deficit Hyperactivity Disorder:**

- a) Neuropsychological dysfunctions
- b) Conduct problems
- c) Anxiety
- d) Language disorder
- e) Sleep disorder

**32. Evolution with age of Attention Deficit Hyperactivity Disorder:**

- a) Can lead to higher rates of substance use disorders
- b) Can lead to higher rates of obesity
- c) Can be associated with low self-esteem
- d) Can be associated with higher rates of trauma
- e) Can improve

**33. The link between Attention Deficit Hyperactivity Disorder and addictions:**

- a) Can be due to a common vulnerability
- b) Can result from reverse causality
- c) Is present only in the case of comorbid behavioral disorders
- d) Is present only in males
- e) Is common

**34. Attention Deficit Hyperactivity Disorder and bipolar disorder:**

- a) Are never comorbid
- b) Overlap in several symptoms
- c) Are sometimes difficult to distinguish
- d) Can share the symptom of motor inattention
- e) All answers are correct

**35. According to the DSM5, Autism Spectrum Disorder is**

- a) A communication disorder
- b) An anxiety disorder
- c) A neurodevelopmental disorder
- d) A genetic disorder

**36. The Temporal Voice areas**

- a) Are located in the Inferior Frontal Gyrus
- b) Respond more to vocal than non-vocal sounds
- c) Are located along the Superior Temporal Sulcus
- d) Respond more to non-vocal than vocal sounds

**37. What are the best practices when conducting a research on ASD?**

- a) Perform only group analysis
- b) Ignore clinical information regarding the patient
- c) Look at individual data
- d) Know your population

**38. A voice's fundamental frequency**

- a) Corresponds to the perceived voice pitch
- b) Is a biological marker of ASD
- c) Corresponds to the resonance step of voice production
- d) Depends on the quantity of air that flows through the vocal cords

**39. Voice production involves three stages, they are**

- a) Respiration, digestion, resonance
- b) Inhalation, resonance, articulation
- c) Respiration, phonation, resonance
- d) Articulation, resonance, perception

**40. The auditory pathways includes the following structures**

- a) The occipital cortex
- b) The superior colliculi
- c) The Thalamus
- d) The putamen



# PHYSIOPATHOLOGIE EN NEUROLOGIE ET PSYCHIATRIE

**Mardi 28 Novembre**

Durée total de l'examen : 2 heures

Vous devez répondre aux QCMs et À UN SEUL des deux autres sujets (topic 1 **ou** topic 2).  
PENSEZ à indiquer votre numéro d'étudiant sur les feuillets de réponse (pages 2 et 3 ou 7).

Total examination duration: 2 hours

You must respond to the MCQ exam and to ONLY ONE of the two other exams topics (topic 1 **OR** topic 2). REMEMBER to indicate your student number on pages 2 and 3 or 7 of this examination paper.

Numéro étudiant/  
Student number : \_\_\_\_\_

## MCQ exam (20 pts)

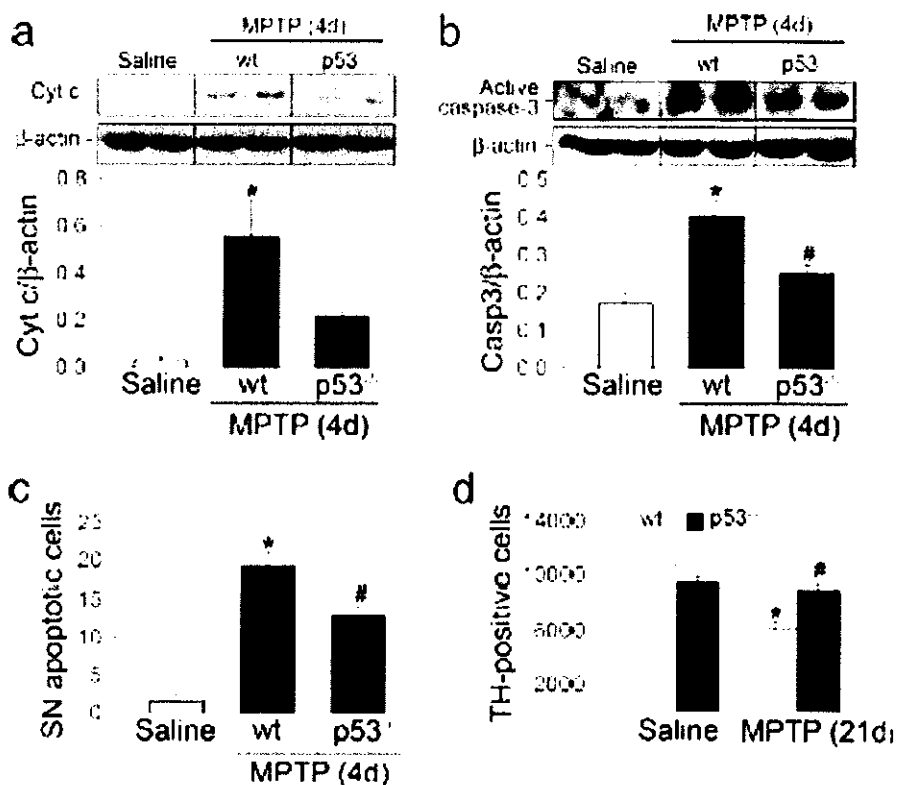
Test duration: 1 hour

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This exam contains 40 multiple choice questions, each worth 0.5 points.

Indicate with a cross the correct response(s) for each question. Each question could have several correct answers. Make sure that your answer is clearly marked.





**Fig. 3.** Loss of p53 in gene-targeted mice attenuates MPTP-induced SNpc DA apoptotic cell death. (a and b) At the peak of MPTP-induced mitochondria-dependent apoptotic cell death (4 days after the last MPTP injection), cytochrome c release and caspase-3 activation are reduced in ventral midbrain cytosolic fractions of p53-deficient mice. (c) The number of MPTP-induced SNpc apoptotic neurons is decreased in the ventral midbrain of p53-deficient mice compared with similarly treated wild-type mice. Morphological criteria to identify apoptotic cells included shrinkage of the cell body, chromatin condensation, and the presence of distinct, round, well defined chromatin clumps, demonstrated on thionin staining, as in ref. 8. (d) p53-deficient mice exhibit a significant protection against MPTP-induced SNpc DA cell death, as determined by assessing the number of SNpc DA neurons at 21 days after the last MPTP injection. \*,  $P < 0.05$  compared with saline-injected mice; #,  $P < 0.05$  compared with MPTP-injected wild-type mice.

**Q2. What is the main hypothesis tested in this experiment?**

**Q3. Briefly describe the methods.**

**Q4. Describe the main results of the experiment.**

**Q5. Conclude and discuss the results.**





Numéro étudiant/

Student number : \_\_\_\_\_

**Topic n°2 (Choose only one topic !)**

**Muriel Darnaudéry**

répondre dans l'espace imparti / answer only in the space provided

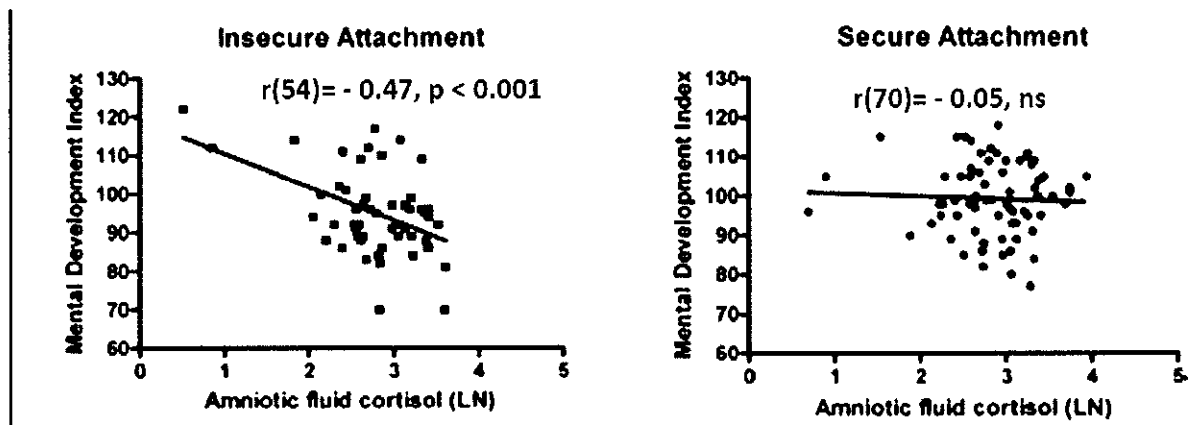
1. Les glucocorticoïdes sont responsables des effets délétères du stress prénatal. Donnez des arguments expérimentaux en faveur de cette hypothèse et des arguments montrant l'implication d'autres facteurs.

Glucocorticoids underlie the detrimental effects of prenatal stress. Describe experimental evidences supporting this hypothesis and studies indicating that others factors are also involved.

(10 points, 1 page max)

2. Quel était le but de l'expérience? Décrivez brièvement la méthodologie utilisée et décrivez les résultats de l'étude. Proposez une interprétation des résultats au regard de vos connaissances sur l'impact des facteurs pré et post-nataux sur le cerveau. Discutez les limites de l'étude.

What was the aim of the experiment? Briefly describe the methods. Expose the results. Discuss results according to your knowledge on pre and postnatal environment impact on brain. Discuss the limitations of the study.



*Bergman et al., Biol Psychiatry. 2010 Jun 1;67(11):1026-32*

(10 points, 1 page max)





