Neurobiology Quiz

28 questions

Name: _____ **Date:** _____ **Score:** _____

1. Which biological state is identified as the 'default' setting for most modern institutions according to the Richmond Anomaly analysis?

- **A** The Respiration Mode
- **B** Hunter, Gatherer Mode
- **C** The Anabolic Play State
- **D** The Sovereign Health State

2. What is the primary physical penalty referred to as 'Hypertonicity' in the context of the cortisol tax?

- **A** Reduced blood flow to the prefrontal cortex
- **B** The breakdown of muscle tissue for fuel
- **C** Chronic, low-level muscle tension
- **D** Accelerated depletion of glycogen reserves

3. How does high cortisol affect the brain's processing centres during a high-stakes contest?

- **A** It strengthens the connection between the prefrontal cortex and the amygdala.
- **B** It reroutes blood flow away from the prefrontal cortex.
- **C** It increases spatial awareness and strategic execution.
- **D** It activates the ventral vagus nerve to enhance peripheral vision.

4. In the 'Thriving Cocktail', which hormone is specifically responsible for antagonising and dampening the release of cortisol?

- **A** Dopamine
- **B** Serotonin
- **C** Oxytocin
- **D** Adrenaline

---

5. Which molecule is described as the 'master key' to Richmond's success due to its ability to activate the body's internal braking system?

- **A** Endorphin
- **B** Anandamide
- **C** Noradrenaline
- **D** Glucocorticoid

---

6. What is the primary function of the Endocannabinoid System (ECS) according to the Richmond Anomaly framework?

- **A** To mobilise emergency sugar through accelerated glycolysis.
- **B** To act as a natural 'braking system' that restores balance.
- **C** To increase resting muscle tension for explosive action.
- **D** To trigger the catabolic breakdown of muscle and connective tissue.

---

7. What occurs during the process of 'Retrograde Inhibition' within the nervous system?

- **A** A signal travels forward to increase the release of glutamate.
- **B** The sending neuron forces the receiving neuron to shut down permanently.
- **C** Anandamide travels backward from a receiving neuron to a sending neuron.
- **D** Cortisol travels from the adrenal glands to the prefrontal cortex.

---

8. Why did Richmond players exhibit unprecedented injury resilience during the 2017 season?

- **A** Because they used pharmacological blockers to numb pain during games.
- **B** Because they were maintained in an anabolic (building and repair) state.
- **C** Because they avoided physical exertion during the training week.
- **D** Because their CB_1 receptors were functionally downregulated.

9. What evidence suggested Richmond's late-game dominance was due to metabolic efficiency rather than just superior fitness?

- **A** They dominated their opponents consistently from the first minute of the game.
- **B** Their players showed higher levels of adrenaline in the fourth quarter.
- **C** They conserved glycogen stores by remaining in an aerobic metabolism.
- **D** They utilised proteolysis to generate extra energy late in the game.

10. How did the 'Triple H' sessions contribute to the biological shift of the team?

- **A** They focused on identifying the technical deficits of each player.
- **B** They provided a permission structure for vulnerability and psychological safety.
- **C** They were designed to increase competitive aggression between teammates.
- **D** They allowed coaches to micromanage the social lives of the athletes.

11. Which player's transformation was described as a shift from a 'perfect but tight' leader to an 'ego-free' servant leader?

- **A** Dustin Martin
- **B** Bachar Houli
- **C** Trent Cotchin
- **D** Jack Riewoldt

12. What is the consequence of 'functional downregulation' of CB_1 receptors in a chronically stressed individual?

- **A** The body becomes hyper-sensitive to calming social signals.
- **B** The HPA axis is left to fire unchecked, resulting in a 'loss of the brake'.
- **C** It facilitates the rapid repair of micro-tears in muscle tissue.
- **D** It triggers a surge in anandamide production to restore balance.

13. In the context of 'Terrain Theory', what is the primary clinical objective for elite performance or health?

- **A** Increasing mechanical load to build physical toughness.
- **B** Upregulation of the Endocannabinoid System and regulation of the HPA axis.
- **C** Maximising catecholamine levels to ensure high arousal during competition.
- **D** Utilising external pharmacological substitutions to force cellular responses.

14. Which chemical component of the 'Thriving Cocktail' provides focus and drive without the hyperarousal and crash of an adrenaline spike?

- **A** Endorphins
- **B** Dopamine
- **C** Cortisol
- **D** Oxytocin

15. What does the term 'Anabolic Terrain' imply for an athlete's recovery?

- **A** The athlete's body is actively breaking down protein for fuel.
- **B** The body is in a state of building and repair, promoted by lowering cortisol.
- **C** The athlete is experiencing 'tunnel vision' and cognitive decline.
- **D** The athlete is burning glucose through accelerated glycolysis.

16. Which player was known as the 'emotional barometer' who celebrated others' successes more than his own?

- **A** Trent Cotchin
- **B** Jack Riewoldt
- **C** Bachar Houli
- **D** Dustin Martin

---

17. The '5 coffee' mandate was a tool designed to:

- **A** Improve the cardiovascular endurance of the athletes.
- **B** Manually repair the social fabric and dismantle cliques.
- **C** Monitor the players' caffeine intake during the off-season.
- **D** Gather data on the players' personal spending habits.

---

18. What is the relationship between the Prefrontal Cortex (PFC) and the Amygdala in the 'Play State'?

- **A** The Amygdala overrides the PFC to ensure rapid survival reflexes.
- **B** The PFC remains online and integrated, allowing for strategic clarity.
- **C** The PFC is bypassed entirely to maximise physical speed.
- **D** The PFC induces a state of hyper-vigilance and fear.

---

19. According to the 'Phew' protocol, how does chronic stress affect cellular quality control?

- **A** It accelerates apoptosis to remove damaged cells quickly.
- **B** It creates a 'biological blockade' against programmed cell death.
- **C** It improves the accuracy of DNA replication in the striatum.
- **D** It triggers an anabolic environment that prevents cellular mutations.

---

20. Dustin Martin's 2017 season was described as an expression of 'disciplined freedom'. What did this imply?

- **A** Freedom from the team's strict tactical game plans.
- **B** The discipline to ignore personal health in favour of winning.
- **C** The discipline to let go of internal fear and external expectation.
- **D** A tactical role where he was allowed to play without any defensive duties.

21. Which process is described as the body 'literally breaking down muscle and connective tissue to fuel the panic response'?

- **A** Glycogenesis
- **B** Proteolysis
- **C** Homeostasis
- **D** Retrograde Signalling

22. What was the critical condition imposed on Damian Hardwick by Richmond's leadership for his retention in 2017?

- **A** He had to deliver a Premiership within 12 months.
- **B** He had to lead a complete cultural pivot based on connection.
- **C** He was required to strictly monitor player compliance with fitness standards.
- **D** He had to adopt a more authoritarian model of leadership.

23. What is the role of anandamide in the 'negative feedback loop' of the stress response?

- **A** It stimulates the adrenal glands to produce more cortisol.
- **B** It signals the sending neuron to stop firing aggressively.
- **C** It reroutes blood flow away from the prefrontal cortex.
- **D** It induces hypertonicity to prepare the body for combat.

24. The 'Phew' text argues that humanity's over-reliance on the 'Hunter, Gatherer' brain is a result of:

- **A** An inevitable and successful evolutionary progression.
- **B** A biological prison that defies conventional analysis.
- **C** A lack of advanced modern technology.
- **D** Superior physical conditioning compared to our ancestors.

25. Which hormonal ratio is referred to in sports science as the 'gold standard' for recovery, as mentioned in Appendix B?

- **A** The Oxytocin to Adrenaline ratio
- **B** The Testosterone to Cortisol (T:C) ratio
- **C** The Dopamine to Serotonin ratio
- **D** The Anandamide to Glutamate ratio

26. In the 'Phew Protocol', what is the purpose of using cryogenic THCA and oxidized CBNa in the 'Whisper Theory'?

- **A** To flood the system with loud signals to force a response.
- **B** To encourage the body to upregulate and build more CB_1 receptors.
- **C** To permanently shut down the HPA axis to prevent all stress.
- **D** To induce a state of 'hyper-arousal' required for elite athletics.

27. What was the 'smoking gun' of the Richmond Anomaly's biological shift, according to the on-field data?

- **A** Their total number of goals scored in the first quarter.
- **B** The stunning lack of soft tissue injuries compared to the league average.
- **C** The high number of free kicks awarded to their star players.
- **D** The increased speed of their players during pre-season testing.

28. The concept of 'Sakinah' in the Phew Protocol refers to:

(A) A state of aggressive competitive focus.

(B) Deep tranquillity and a peace dividend of biological surplus.

(C) The mandatory consumption of high-caffeine beverages.

(D) A tactical formation used by Richmond's defensive unit.

Answer Key

1. **B** *The text describes this 'Survival State' as a wrong evolutionary turn where humanity became over-reliant on an anxious, inefficient brain response.*

2. **C** *Hypertonicity is described as a 'chronic, low-level clench' that reduces muscle elasticity and fluidity, increasing injury risk.*

3. **B** *The 'stupid brain effect' occurs when the strategic command centre is taken offline in favour of the primitive, reactive amygdala.*

4. **C** *Oxytocin, the 'bonding hormone', acts as a powerful anxiolytic that directly signals systemic safety to the nervous system.*

5. **B** *Anandamide, the 'bliss molecule', binds to CB_1 receptors to provide retrograde inhibition of the stress response.*

6. **B** *The ECS uses negative feedback loops to stop aggressive neural firing and restore systemic calm.*

7. **C** *Anandamide binds to CB_1 receptors on the sending neuron, delivering a message to 'stop firing' to restore calm.*

8. **B** *By lowering cortisol, the players avoided catabolic tissue breakdown and could conduct real-time repair of micro-tears.*

9. **C** *While opponents burned emergency fuel through catabolism, Richmond stayed in a low-cost metabolism, leaving them with 'full tanks' for the finish.*

10. **B** *By sharing personal stories, the team replaced the 'mask of toughness' with authentic connection, triggering oxytocin release.*

11. **C** *Cotchin moved from a polished, demanding style to one of radical self-compassion and servant leadership.*

12. **B** *The body removes receptors to dampen the noise of constant threat, leaving the stress response without its regulatory mechanism.*

13. **B** *Establishing a healthy internal 'terrain' is the prerequisite for all other metabolic or physical interventions to be effective.*

14. **B** *By celebrating small wins and humour, Richmond generated dopamine to maintain drive while avoiding the 'panic' response of adrenaline.*

15. **B** *By reducing stress hormones, growth hormones and testosterone can function properly to heal micro-tears and recover faster.*

16. **B** *Previously seen as 'petulant', Riewoldt transformed his passion into a care-focussed brotherhood.*

17. **B** *By forcing connection with less-known teammates, the team replaced isolation with a sense of safety and brotherhood.*

18. **B** *In the play state, managed levels of stress chemicals allow the brain's executive centres to function effectively under pressure.*

19. **B** *High cortisol downregulates the 'kill switches' of malfunctioning cells, creating a terrain ripe for chronic disease.*

20. **C** *By silencing 'nervous' energy, he achieved a state of liberation where his nervous system no longer required external validation.*

21. **B** *Proteolysis is a destructive, catabolic process where proteins are broken down into emergency sugar.*

22. **B** *The leadership chose stability and connection over the 'quick fix' of firing the coach.*

23. **B** *By binding to CB_1 receptors, it hits the 'mute button' on the wave of panic.*

24. **B** *The analysis suggests we have lost the ability to access our optimal 'Respiration Mode' due to chronic stress.*

25. **B** *If cortisol is high, testosterone is blocked; shifting this ratio by lowering cortisol prevents the late-game 'fade'.*

26. **B** *By providing a subtle stimulus, the neuron perceives a deficit and builds more 'antennas' to catch the signal.*

27. **B** *This lack of injuries was 'unheard of' and proved they were maintaining an anabolic terrain that healed micro-tears.*

28. **B** *The protocol aims to clear the static of survival-mode so one can better fulfil their purpose and service.*