

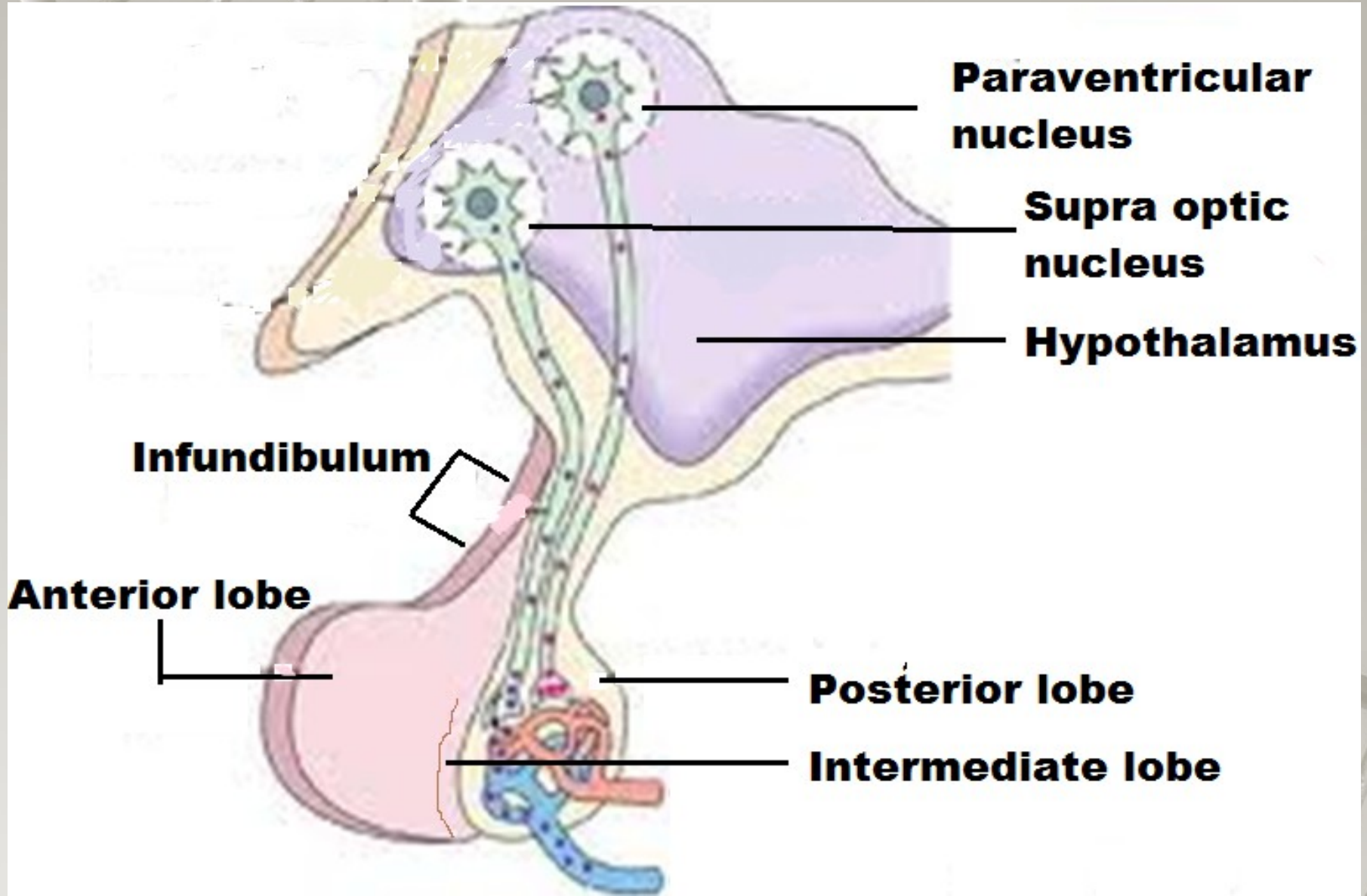


BIOLOGY

Pituitary gland and Its Functions

Effects of Narcotic Drugs and Alcohol on Human Body

Pituitary Gland and its functions



- **Location - sella turcica**
- **Attached to the hypothalamus by a stalk called infundibulum.**
- **Size - pea sized**
- **Measures - 1-3 cm in diameter**
- **weighs - 0.5gms**

Lobes-

- **Adenohypophysis or Anterior pituitary**
- **Neurohypophysis or Posterior pituitary.**

• **Adenohypophysis consists of three divisions-**

- **Pars distalis**
- **Pars tuberalis**
- **Pars intermedia**

- **Adenohypophysis** arises from the roof of pharynx as an upward outgrowth called **Rathke's pouch**.
- **Neurohypophysis** arises from the **hypothalamus** as a downward outgrowth.
- **Adenohypophysis** consists of two types of cells
 - **Chromophobe cells (about 50%)**
 - **Chromophil cells (about 50%)**

•**Chromophobes-**

•do not possess granules, stain poorly,
•non secretory, precursors of chromophils.

•**Chromophils** contain a large number of granules and are darkly stained.

•Based on staining property,

-**Acidophilic cells or Alpha cells** (about 35%)

-**Basophilic cells or beta cells** (about 15%)

• **Chromophils** are classified into five types (secretory basis)

1. Somatotropes

- GH

2. Corticotropes

- ACTH

3. Thyrotropes

- TSH

4. Gonadotropes

- FSH & LH

5. Lactotropes

- Prolactin

• **Somatotropes and Lactotropes are acidophils while others are basophils.**

• **The secretion of adenohypophysis is regulated by Releasing and Inhibitory hormones secreted by the hypothalamus.**

•The Releasing and Inhibitory hormones are-

- Growth hormone/ Somatotropin releasing hormone (GHRH or SRH)**
- Growth hormone Release Inhibitory hormone(GHRIH) or Somatostatin**
- Thyrotropin Releasing hormone(TRH)**
- Corticotropin Releasing hormone (CRH)**

-Gonadotropin Releasing hormone(GnRH)

-Prolactin Releasing hormone(PRH)

-Prolactin Inhibitory hormone (PIH)

-Melanocyte Releasing hormone(MRH)

-Melanocyte Inhibitory hormone(MIH)

**Hormone secreted by
Adenohypophysis and their
functions:**

- 1. Growth Hormone(GH) or
Somatotropic hormone(STH)**
 - **Stimulates growth of the
body(bone, muscles etc)**
 - **Hyposecretion**
 - a) **In children-leads to Dwarfism**
 - b) **In adults- leads to Simmond's
disease**

-Hypersecretion

a) In children- leads to Gigatism

b) In adults- leads to Acromegaly

2. Adrenocorticotrophic Hormone (ACTH) or Corticotropin

-Stimulates growth and secretion of adrenal cortex

3. Thyroid Stimulating hormone (TSH) or thyrotropin

-Stimulates growth and secretion of thyroid gland

4. Gonadotropins

A. Follicle Stimulating hormone (FSH)

- In **males**- sperm formation
- In **females**-growth of ovarian follicles , secretion of oestrogens

B. Luteinizing hormone (LH)

- In **females**- stimulates **ovulation**, growth of **corpus luteum** and secretion of **progesterone**

-In **males**, it is called **Interstitial cell stimulating hormone (ICSH)** which stimulates **Leydig's cells** to secrete **testosterone**.

5. Prolactin (PRL) or Luteotropic hormone (LTH)

-**Stimulates growth of mammary glands and secretion of milk**

6. Melanocyte Stimulating hormone (MSH)

-secreted by **pars intermedia**

-Stimulates melanin pigment synthesis in humans.

Neurohypophysis:

•It is made up of neural type of cells called **pituicytes** and **unmyelinated nerve fibres**.

- The **pituicytes** act as supporting cells and do not secrete any hormone.
- The **unmyelinated nerve fibres** come from **supra optic and paraventricular nuclei** of hypothalamus through **pituitary stalk**.
- **Neuohypophysis** does not secrete any hormone but **stores and releases hormones** secreted by **neurosecretory cells** hypothalamus.

Hormones of Neurohypophysis and their functions:

1. Oxytocin:

- Secreted by **paraventricular nucleus** of hypothalamus.
- **Childbirth & facilitating delivery.**
- **Contracts smooth muscle fibres of mammary glands and stimulated release milk after childbirth.**

2. Vasopression or Antidiuretic hormone (ADH)

- It is secreted by the **supra optic nucleus** of hypothalamus.
- Reabsorption water in the DCT and CT.
- Increase of BP.
- **Hyposecretion**-cause **Diabetes insipidus**.

Drug and Alcohol Abuse

- **Drug** – A chemical which , when taken in some way alters the body functions.
- Intake of drug for a medical purpose to treat body's disorder is known as its **“Use”**.
- Intake of drug for a non-medical purpose and in amount, strengths and manner or frequency that impairs physical and mental function is called **“Abuse”**.

- **Addiction** is the habitual, psychological and physiological dependence on a substance or a practice, beyond voluntary control.
- An **addictive (habit forming) drug** is a substance that modifies the biological or social behavior of a person by stimulating, depressing or distorting the functions of the body and mind.

Types of addictive drugs

1. Psychotropic drugs:

- They are **mood altering** drugs which **selectively affect behaviour, perception and mental ability.**

- **Stimulants, Sedatives and tranquillizers (Depressants) and Opiates (Analgesics) are of psychotropic drugs.**

2. Psychedelic drugs (Hallucinogens)

- **They are drugs which alter thoughts feelings and perceptions without actual sensory stimulus.**
- **They cause the users to see, imagine and hear things in an exaggerated manner.**

Major Groups of Drugs and their Effects:

| Types of drugs | Example | Effects |
|------------------------------------|---|--|
| Stimulants | Caffeine, Cocaine, Amphetamines | Make a person more wakeful , alert and active , cause excitement |
| Sedatives and Tranquilizers | Barbiturates, Benzodiazepines | Depress CNS activity, give feeling of calmness, relaxation, drowsiness. high doses induce deep sleep. |
| Opiates(Analgesics) | Opium, morphine, codeine, Heroin, pethidine, Methadone | Suppress brain activity, relieve pain |
| Hallucinogens | Bhang, ganja, charas, LSD, Mescaline, Psilocybin | Alter thoughts, feelings and perceptions cause illusion |

Plant yielding Narcotic drugs

- 1. *Papaver somaniferum* (poppy)-
Opium and its derivatives
(Morphine, Codeine, Heroin)**
- 2. *Cannabis sativa*- Bhang, Ganja,
Marijuana, Charas**
- 3. *Thea sinensis* (Tea)- Caffeine**
- 4. *Coffea* (Coffee)- Caffeine**
- 5. *Theobroma cacao* (Cacao)-
Caffeine**

6. *Erythroxylon coca* (Coca)-
Cocaine

7. *Lophophora williamsii* (Peyote
cactus)- **Mescaline**

8. *Claviceps purpurea* (Ergot
fungus)- **LSD**

9. *Psilocybe mexicana* (Mexican
mushroom)- **Psilocybin**

Alcohol Abuse:

- **Alcoholism** is a state of continued excessive use of alcohol and addiction to it.
- **Alcohol** - quickly absorbed in the stomach and upper part of the small intestine and reaches tissues in a few minutes.
- It is a **depressant** which acts as a **sedative, analgesic and anaesthetic agent**.

Effects of Alcohol

- 1. On CNS- Slurred speech, mental confusion, drowsiness, loss of balance and muscular co-ordination etc.**
- 2. On digestive system-Alcoholic fatty syndrome, liver cirrhoses, Pancreatitis, alcoholic hepatitis, loss of appetite, Hyperacidity and ulcer of oesophagus, stomach and duodenum etc.**

- 3. On Circulatory system- Cardiomegaly, Arteriosclerosis, Hypertension, Heart Attack.**
- 4. On muscles- Degeneration of contractile muscle fibrils resulting in muscle pain and weakness.**
- 5. Effects on Immunity- Immunity level falls down. They become prone to infections.**

Reasons for Drug/ Alcohol Abuse:

An adolescent can easily fall prey to drugs and alcohol. Some of the reasons are-

- **Curiosity**
- **Pleasure**
- **Group or Peer pressure**
- **Feeling of Independence**
- **Relief from pain**
- **Overcoming frustration and depression**
- **Excitement and Adventure**
- **Family history**

Prevention and Control:

- 1. Avoid** undue pressure to achieve beyond the capability of the child.
- 2. Appreciation** of even for smallest achievement of the child.
- 3. Consistent discipline** without suffocating strictness.

- 4. Education and counselling the child to face the stresses, failures, disappointments and problems in life.**
- 5. Channelization of energy of the child to develop hobby, sports, music, yoga etc.**
- 6. Seeking Professional and Medical help from Psychologists, Psychiatrists, Deaddiction and Rehabilitation specialists to treat the addicts.**

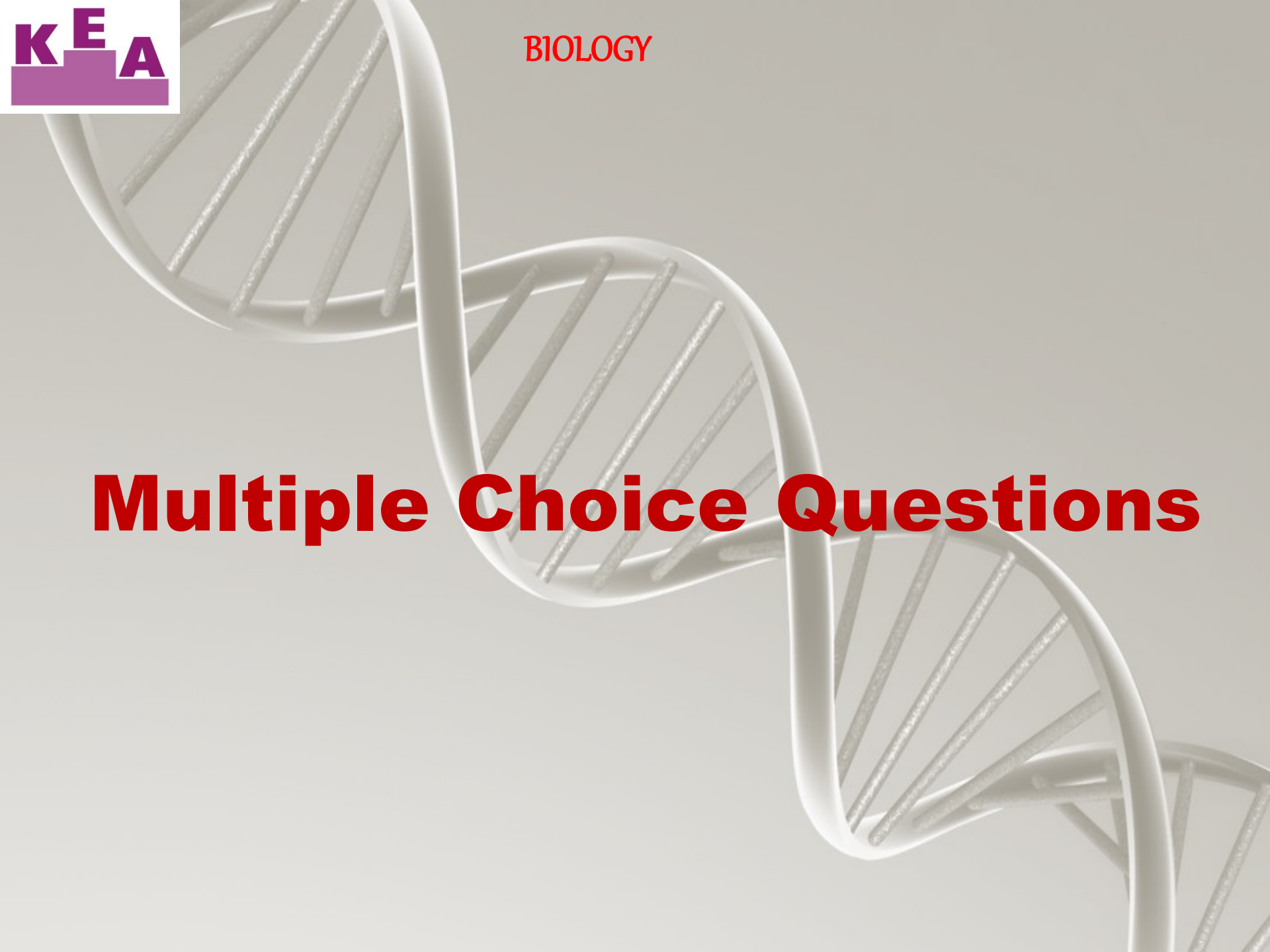
The family and friends should be considerate to the affected person and help the person to gain will power to come out of the problem.





BIOLOGY

Multiple Choice Questions



1. Various hormone releasing factors have their seat in

- 1. Hypothalamus**
- 2. Pineal body**
- 3. Pituitary gland**
- 4. Pancreas**

2. The hormone which stimulates milk production in mammals is known as

- 1. Glucagon**
- 2. Prolactin**
- 3. Progesterone**
- 4. Oestrogen**

3. Oxytocin is a

- 1. Large peptide**
- 2. Small peptide**
- 3. Fatty acid residue**
- 4. Sugar molecule**

4. Hormones controlling childbirth and milk release from mammary glands are released by

- 1. Anterior lobe of pituitary**
- 2. Thyroid**
- 3. Adrenal**
- 4. Posterior lobe of pituitary**

5. Match the following columns & choose the correct option

| | Column I | | Column II |
|----------|-----------------|----------|--|
| a | LH | p | Gametogenesis |
| b | FSH | q | Ovulation |
| c | STH | r | Reabsorption of water in Kidney tubules |
| d | ADH | s | Growth of the body |
| | | t | Thyroxine secretion |

- 1. a-q, b-s, c-t, d-r**
- 2. a-p, b-q, c-r, d-t**
- 3. a-q, b-p, c-s, d-r**
- 4. a-q, b-r, c-t, d-s**

6. Melanin is secreted under the influence of hormone of

- 1. Posterior lobe of pituitary**
- 2. Anterior lobe of pituitary**
- 3. Intermediate lobe of pituitary**
- 4. Adrenal medulla**

7. Point out the odd one

1. Noradrenaline

2. FSH

3. LH

4. Prolactin

8. Synthesis of testosterone by Leydig's cells is stimulated by

- 1. ICSH**
- 2. FSH**
- 3. TSH**
- 4. LTH**

A large, light gray, semi-transparent DNA double helix structure is positioned diagonally across the background of the slide, starting from the top left and extending towards the bottom right.

9. Acromegaly is due to the hypersecretion of

1. LH

2. MSH

3. TSH

4. STH

10. Which hormone is not produced by pituitary gland?

1. FSH

2. MSH

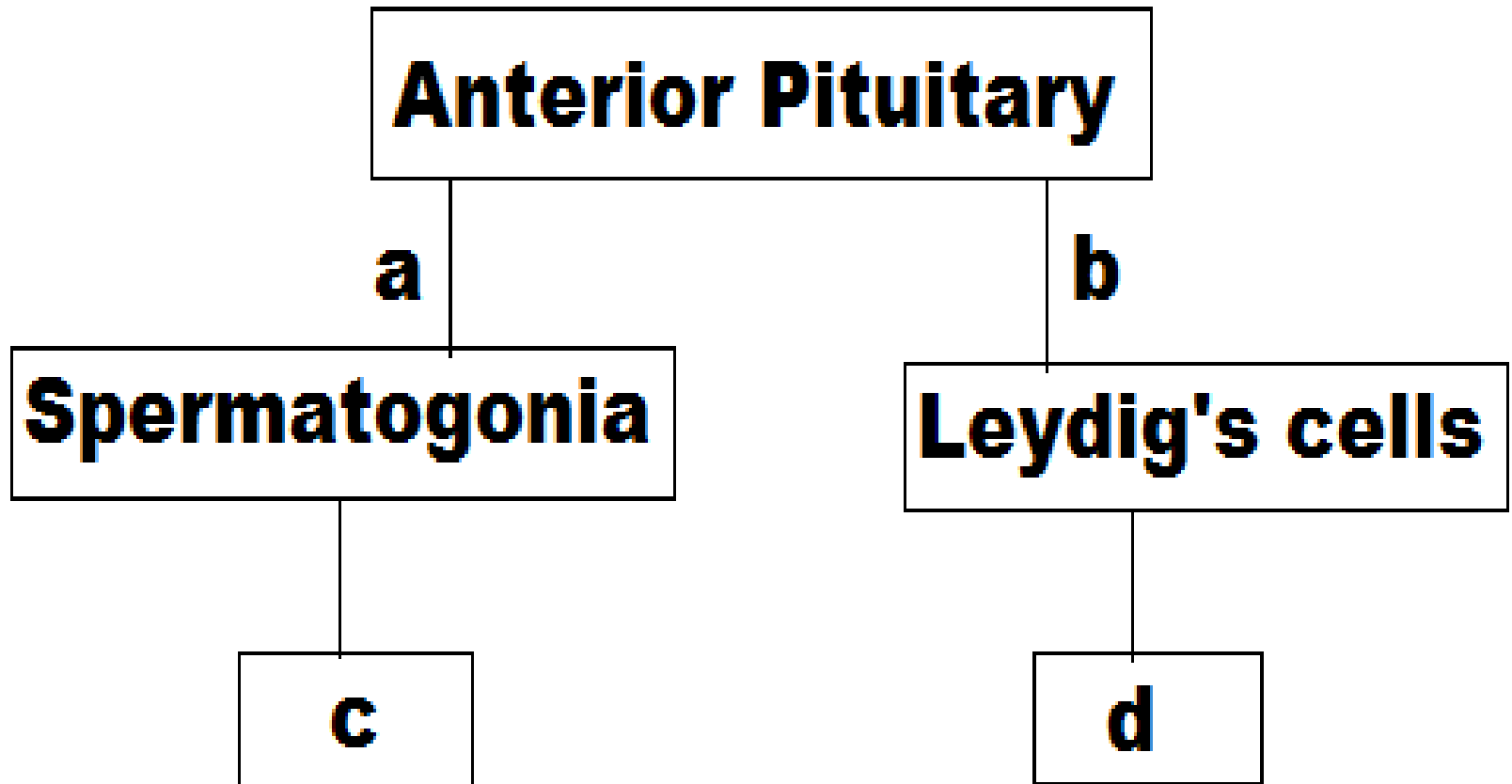
3. Oxytocin

4. Prolactin

11. Sella turcica is

- 1. A band connecting cerebral hemispheres**
- 2. Foramen of skull**
- 3. Skull depression lodging pituitary**
- 4. Lodging of heart**

12. Choose the correct combination of labelling the hormones:



- 
- A large, light gray DNA double helix structure is visible in the background, winding across the page from the top left towards the bottom right.
- 1. a- FSH, b-ICSH, c-Sperm, d- Testosterone**
 - 2. a- ICSH, b-FSH, c-Testosterone, d-Ovum**
 - 3. a-Oestrogens, b-LTH, c-Testosterone, d-FSH**
 - 4. a-FSH, b-ICSH, c-Testosterone, d-Sperm**

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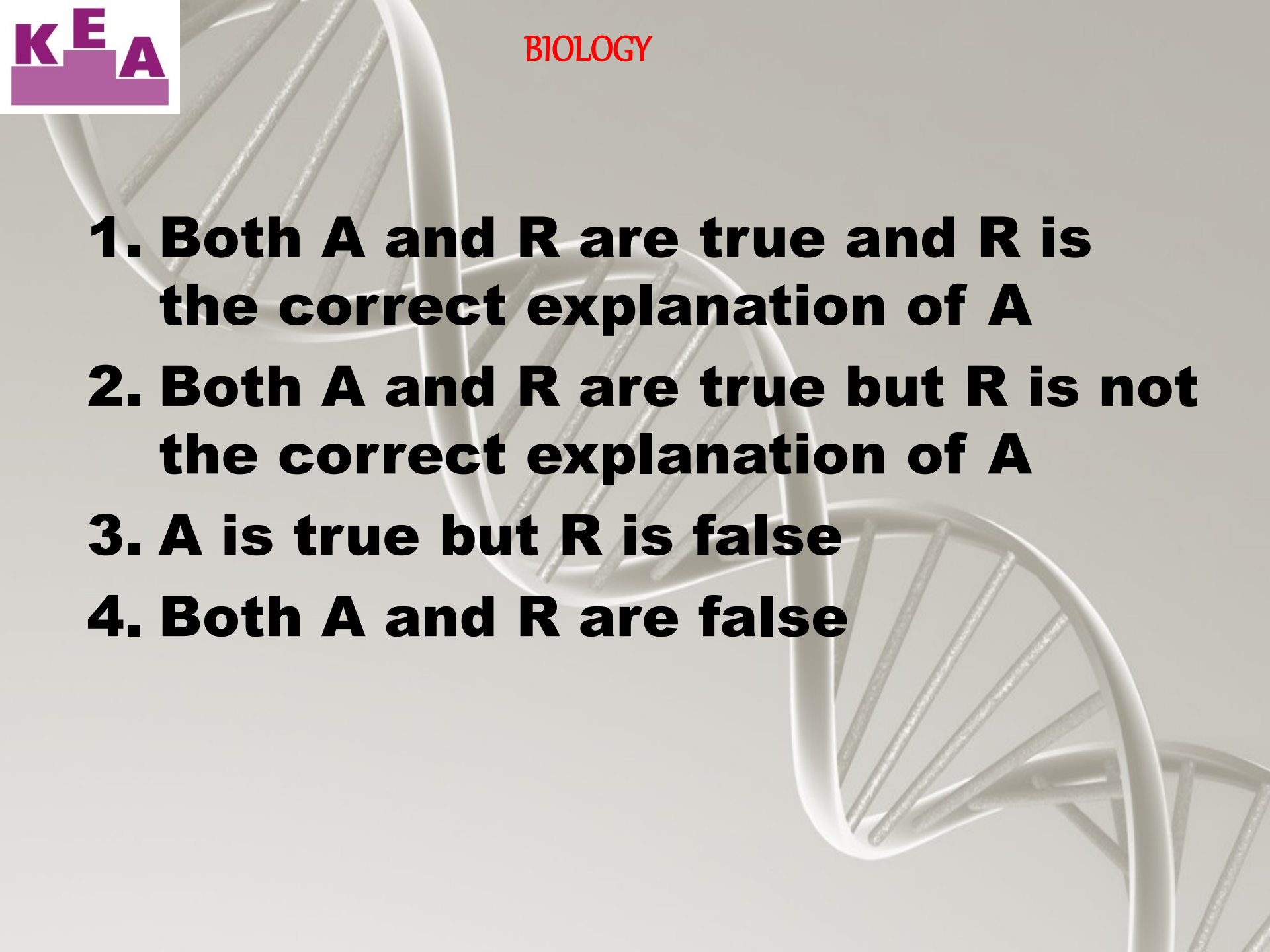
13. Secretion oestrogen is controlled by

- 1. HCG**
- 2. FSH**
- 3. Progesterone**
- 4. Testosterone**

14. The following question has a statement of Assertion(A) and a statement of Reason(R). Choose the correct option as directed.

Assertion(A): Morphine is the most effective analgesic.

Reason(R): It binds to the post synaptic membrane and blocks the binding of neurotransmitters.

- 
- A faint, light gray background image of a DNA double helix structure, showing the characteristic twisted ladder shape with two strands and connecting rungs.
- 1. Both A and R are true and R is the correct explanation of A**
 - 2. Both A and R are true but R is not the correct explanation of A**
 - 3. A is true but R is false**
 - 4. Both A and R are false**

15. Slow respiration, slow pulse and constriction of the pupil occurs due to the drug addiction of

- 1. Cocaine and Heroin**
- 2. Alcohol and thalidomide**
- 3. Nicotine and caffeine**
- 4. Morphine and Opium**

16. Match the columns:

| | Column I | | Column II |
|----------|----------------------|----------|-------------------|
| a | Stimulants | p | Nembutal |
| b | Depressants | q | Benzedrine |
| c | Opiates | r | Ganja |
| d | Hallucinogens | s | Heroin |

- 1. a-s, b-p, c-r, d-p**
- 2. a-q, b-r, c-p, d-s**
- 3. a-q, b-p, c-s, d-r**
- 4. a-p, b-q, c-s, d-r**

17. Which one alters thoughts and perceptions without any sensory stimulus?

- 1. Sedatives**
- 2. Cocaine**
- 3. Opiates**
- 4. Hallucinogens**

18. The drug often used for reducing appetite is

1. Amphetamine

2. LSD

3. Heroin

4. Valium

19. A purely synthetic opiate is

- 1. Codeine**
- 2. Morphine**
- 3. Pethidine**
- 4. Heroin**

20. Sedatives differ from tranquillizers in

- 1. Sedatives induce sleep while tranquillizers do not do so**
- 2. Sedatives are strong tranquillizers**
- 3. Sedatives cause addiction while tranquillizers do not produce such an effect**
- 4. Sedative depress brain activity while tranquilizers stimulate brain activity**

21. The mildest stimulant is

- 1. Amphetamines**
- 2. Caffeine**
- 3. Cocaine**
- 4. Charas**

22. Hangover is due to the accumulation of

- a) Ethanol in liver**
- b) Ethanol in lungs**
- c) Acetaldehyde in the body**
- d) Conversion of acetaldehyde into formaldehyde**

23. Fatty liver syndrome is due to

- 1. Infection by a virus**
- 2. Intake of excessive fat**
- 3. Intake of excessive alcohol**
- 4. Intake of tobacco by chewing**

24. Opiates are obtained from

1. *Papaver somniferum*
2. *Cannabis sativa*
3. *Thea chinensis*
4. *Claviceps purpurea*

25. THC is associated with

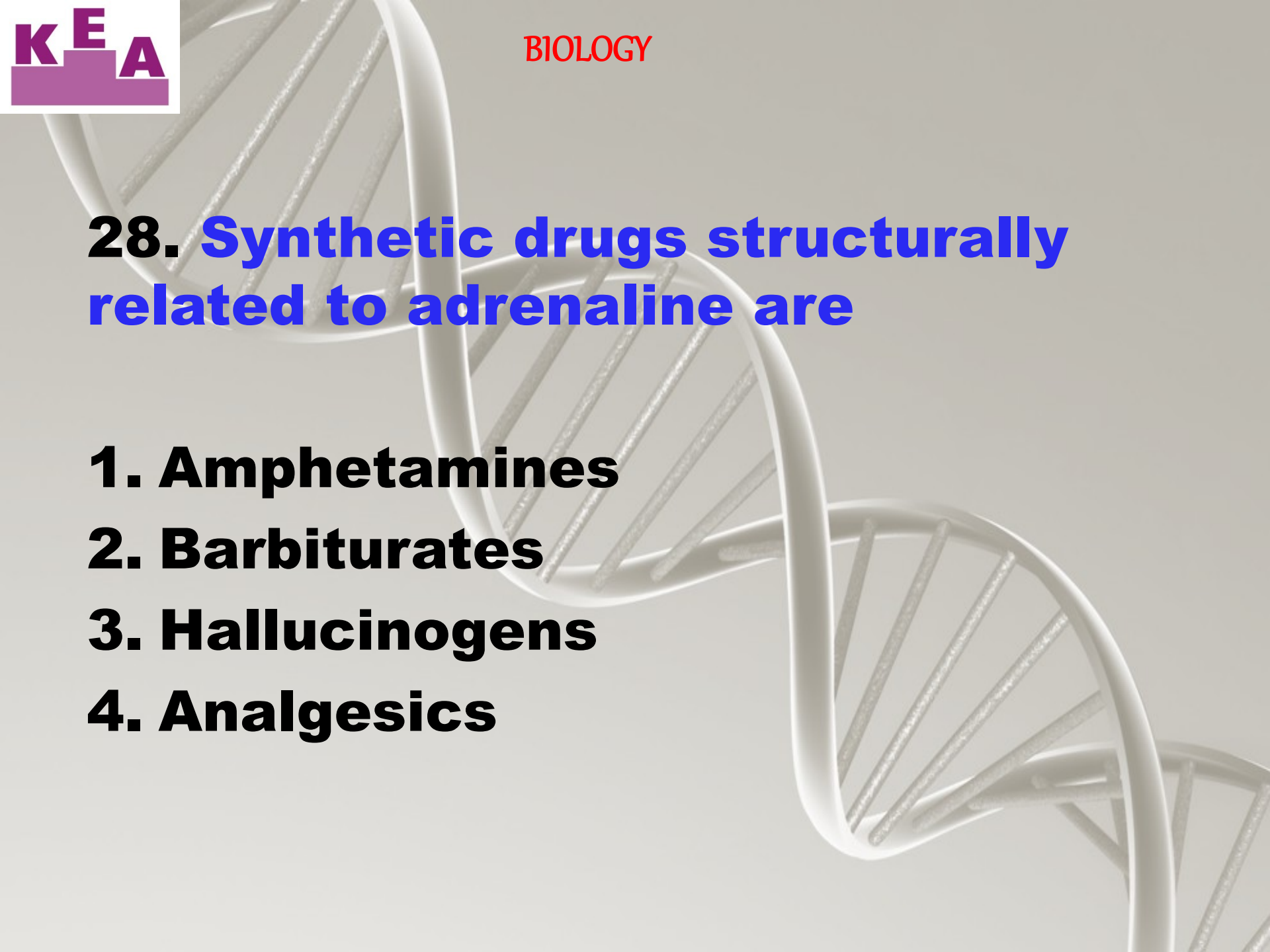
- 1. Papaver***
- 2. Cannabis***
- 3. Erthroxyton***
- 4. Theobroma***

26. Which one is correctly matched?

- 1. Cocaine- Opiate narcotic**
- 2. Bhang- Analgesic**
- 3. Reserpine- Tranquillizer**
- 4. Morphine-Hallucinogen**

27. A drug which acts like a depressant of CNS is

- 1. Amphetamine**
- 2. Caffeine**
- 3. Opium**
- 4. Cocaine**

A large, semi-transparent, light gray DNA double helix structure is shown in the background, winding across the slide from the top left towards the bottom right.

28. Synthetic drugs structurally related to adrenaline are

- 1. Amphetamines**
- 2. Barbiturates**
- 3. Hallucinogens**
- 4. Analgesics**

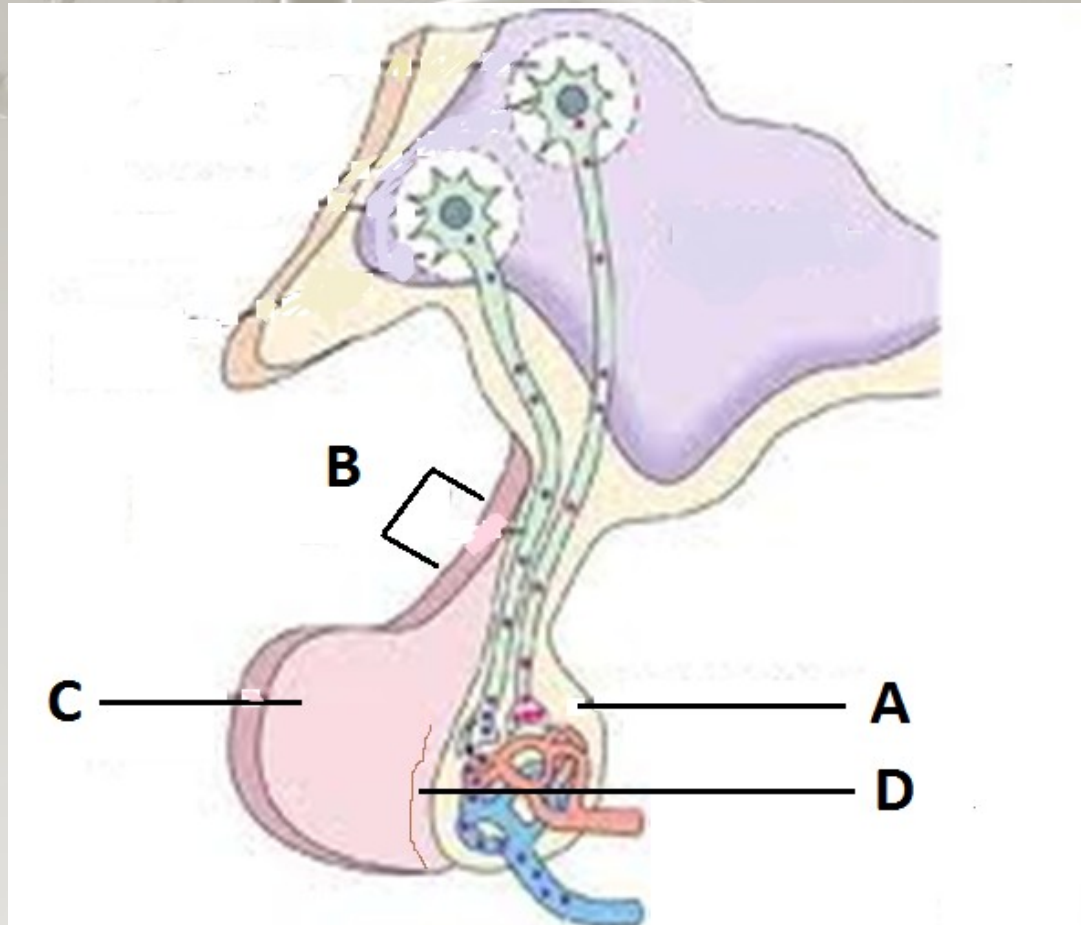
29. Alcoholism leads to

- 1. Cirrhosis of liver**
- 2. Stimulation of CNS**
- 3. Feeling of fatigue condition**
- 4. Increase in Memory**

30. Which one of the following is NOT a hallucinogen?

- 1. LSD**
- 2. Charas**
- 3. Marijuana**
- 4. Cocaine**

31. In the diagram of Pituitary gland identify the parts A,B,C,D



- 1. A- anterior lobe, B-infundibilum, C-middle lobe, D-posterior lobe,**
- 2. A-posterior lobe, B-infundibulum, C-anterior lobe, D- middle lobe**
- 3. A- infundibulum, B-posteriorlobe, C- anterior lobe, D- middle lobe**
- 4. A-posterior lobe, B-anterior lobe, C- infundibulum, D-middle lobe**

32. The enzyme required to oxidise acetaldehyde is

- 1. Ethanol oxidation**
- 2. Alcohol dehydrogenase**
- 3. Acetaldehyde dehydrogenase**
- 4. Glyceraldehyde dehydrogenase**

33. Which is the accumulation and release centre of neurohormones?

- 1. Anterior pituitary lobe**
- 2. Posterior pituitary lobe**
- 3. Intermediate lobe of pituitary**
- 4. Hypothalamus**

34. Coffee and Tea are

- 1. Fermented beverages**
- 2. Alcoholic beverages**
- 3. Distilled beverages**
- 4. Non alcoholic beverages**

35. Mescaline is obtained from

- 1. *Lophophora***
- 2. *Claviceps***
- 3. *Cannabis***
- 4. *Thea***

36. Rathke's pouch is an outgrowth of

- 1. Stomach**
- 2. Oesophagus**
- 3. Pharynx**
- 4. Intestine**

37. The cells of adenohypophysis which do not secrete hormones are

- 1. Chromophobes**
- 2. Acidophils**
- 3. Basophils**
- 4. Glial cells**

38. FSH and LH secretion is regulated by

- 1. GHRH**
- 2. CRH**
- 3. PRH**
- 4. GnRH**

39. _____ is secreted by acidophils

1. ACTH

2. LTH

3. TSH

4. FSH

40. Oxytocin is secreted by

- 1. Supra optic nucleus**
- 2. Chromophobes**
- 3. Chromophils**
- 4. Para ventricular nucleus**