

Year 10 Science Knowledge Booklet

Term 6

Name:

Class:

Year 10 Knowledge and Pillars Test Timetable and Workbook Deadlines						
14 th June	Paper 1	Revision for end of year assessment				
28 th June	C5	C5				
12 th July	Homework 3 in this organiser					





Complete the homework workbook identified on the front of this Knowledge organiser and learn the key knowledge questions and answers ready for the end of year assessment.

Big questions: What is homeostasis and response?

What would happen if you didn't drink enough water? How does the nervous system work? How does the reflex arc protect us? How do drugs affect reactions? How does the endocrine system work? How do we control blood glucose? How is the menstrual cycle controlled? What is contraception and how does it work? How do we treat infertility?

Key vocabulary

Adrenaline	Hormone produced by the adrenal gland in times of fear/stress.
Barrier method (of	Condom or diaphragm. Prevents sperm from reaching the egg.
contraception)	
Central Nervous System	The brain and spinal cord together. Coordinates the response of the
	effectors.
Chemical method (of	Contraceptive pill/implant/patch. Prevents ovulation (release of the egg).
contraception)	
Coordination centre	Receives and processes information from receptors e.g. CNS, pancreas
Endocrine system	The system of glands that secrete hormones.
FSH	Produced by the pituitary gland. A hormone that causes an egg to mature in
	the ovary. Causes oestrogen to be produced.
Glucagon	A hormone produced when blood glucose concentration is too low.
Glycogen	A storage molecule made from many glucose molecules bonded together.
	Found in the liver and muscle cells.
Homeostasis	Maintenance of internal conditions, so they are kept at optimum.
Hormone	A chemical secreted by a gland that travels in the blood and has an effect on
	a target organ. The effects are slower and longer-lasting than the responses
	from the nervous system.
Insulin	A hormone produced when blood glucose concentration is too high.
LH	Produced by the pituitary gland. A hormone that causes ovulation.
Negative feedback	Negative feedback ensures that the changes are reversed and returned back
_	to optimum level.
Oestrogen	Produced by the ovaries. Causes blood lining of the uterus to develop. Stops
	FSH being produced. Stimulates the release of LH.
Oral contraceptives	The contraceptive pill.
Pituitary gland	A gland that secretes several hormones into the blood. It is also known as the
	master gland.
Progesterone	Produced by the ovary. Maintains the blood lining in the uterus. Stops the
	production of the LH and FSH.
Reflex action	A fast, automatic. Does not involve thinking parts of the brain.
Testosterone	Males hormone produced by the testes. Stimulates sperm production.
Thyroxine	Hormone produced by the thyroid gland. Stimulated the metabolic rate.
	Important in growth and development.

What would happen if you didn't drink enough water?



How does the nervous system work?



How does the reflex arc protect us?





How do drugs affect reactions?



How does the endocrine system work?



What is contraception and how does it work?

Name of contraception method	Hormonal or non- hormonal?	How does it work?					
Oral Contraceptives	Hormonal	Contain hormones to inhibit FSH production so no eggs mature					
Injection/Implant/Skin patch	Hormonal	Slow release of progesterone inhibits the maturation and release of eggs					
Barrier method	Non-hormonal	Stops sperm reaching the egg					
Intrauterine devices	Can be Hormonal	Prevents implantation of an embryo or releases a hormone					
Spermicidal agents	Non-hormonal	Kill or disable sperm					
Rhythm method	Non-hormonal	Abstaining from intercourse when an egg may be in the oviduct					
Surgical sterilisation	Non-hormonal	Cut oviduct/sperm duct so gametes can pass along					

How is the menstrual cycle controlled?



How do we treat infertility?





Complete the final section of the homework workbook identified on the front and learn the key knowledge questions and answers for all of the areas covered in this knowledge organiser ready for the test.

Wider reading

https://www.bbc.co.uk/news/health-47691567

Male pill - why are we still waiting?

By Michelle Roberts

Health editor, BBC News online

• Published 26 March 2019



IMAGE SOURCE,GETTY IMAGES

A birth control pill for men has passed initial human safety tests, experts at a leading medical conference have heard.

The once-daily pill contains hormones designed to stop sperm production.

It would be a welcome addition to condoms or vasectomy - the only options currently available to men.

But doctors at the Endocrine Society's annual meeting were told it could still take a decade to bring it to market.

Sex drive

The female pill was launched in the UK more than 50 years ago. So why is a male pill proving so difficult?

Some say there has been less societal and commercial will to get a male pill off the ground but **opinion polls** suggest many men would consider taking it if a pill did become available. Whether women would trust men to reliably take it is another issue.

<u>A UK survey by Anglia Ruskin University</u>, in 2011, found 70 out of 134 women would worry that their male partner would forget to take a pill.

Biologically, the challenge of creating a hormone-based pill for men is making sure that it doesn't blunt sex drive or reduce erections.

Sperm production

In fertile men, new sperm cells are constantly made in the testicles, triggered by hormones. Temporarily blocking this effect without lowering hormone levels to such an extent that it creates side-effects is the issue.

But this latest male pill, being tested by researchers from LA BioMed and the University of Washington, should hopefully achieve this goal, researchers say.



IMAGE SOURCE,GETTY IMAGES

Initial "phase one" safety tests with 40 men looked promising, they told the Endocrine 2019 meeting in New Orleans.

For the 28 days of the study:

- 10 took a placebo, or dummy pill
- 30 took the experimental male pill, 11-beta-MNTDC

And among those taking the androgen-based drug, levels of hormones required for sperm production dropped greatly compared with placebo, returning to normal after the trial. **Erectile dysfunction**

Side-effects, meanwhile, were few and mild.

Five men on the pill reported mildly decreased sex drive - and two described mild erectile dysfunction - but sexual activity was not decreased, no participant stopped taking it because of side-effects and all passed safety tests.

The researchers behind the work, Prof Christina Wang and colleagues, are excited but cautious about the findings.

"Our results suggest that this pill, which combines two hormonal activities in one, will decrease sperm production while preserving libido," she said.

But bigger, longer trials were needed to check it would work well enough as a birth control. **Body gel**

And this is not the only prototype hormone-based male contraceptive Prof Wang has been testing.

She and colleagues have come up with a body gel <u>men in the UK will be trying as part of an</u> international trial.

Users apply it daily to their back and shoulders, where it can be absorbed through the skin. Progestin hormone in the gel blocks natural testosterone production in the testicles,

reducing sperm production to low or nonexistent levels, while replacement testosterone in the gel maintains sex drive and other functions that rely on the hormone.

Meanwhile, Prof Wang, Dr Stephanie Page, and colleagues at the University of Washington School of Medicine, have been testing another compound - DMAU - that they believe men could take as an oral daily contraceptive pill.

And <u>trials in 100 men</u> have suggested this is safe enough to move into the next phase of testing.

Mood disorders

Other scientists have been trying delivering longer-acting birth control hormones in a jab given every other month.

But they **stopped enrolling men to their phase-two study**, looking at the safety and effectiveness of the injection, after some of the volunteers reported side-effects, including mood disorders or depression.

For men who don't fancy taking hormones, researchers have been looking at ways to block sperm flow, stopping it from ever leaving the penis - effectively, a non-surgical vasectomy. Vasalgel - a polymer material that is injected into the two ducts that transports sperm from the left and right testicles to the penis - is being developed as a non-hormonal, reversible, long-acting male contraceptive.

So far, **<u>it has been tested in animals only</u>** - but the researchers behind it have recently received funding to look to begin human trials.

Potential market

Prof Richard Anderson, of the University of Edinburgh, is leading one of the UK trials that will test a contraceptive body gel on men.

He said the pharmaceutical industry had been slow to get behind the idea of a new male contraceptive despite good evidence that both men and their female partners would welcome the additional choice.

"I think that industry has not been convinced about the potential market," he said. "It's certainly been a long story - part of it is lack of investment."

Chequered history

With little industry involvement, he said, researchers had had to rely on charitable and academic funding, which took time.

Allan Pacey, professor of andrology, at the University of Sheffield, said: "The development of a male birth control pill, or injection, has had a chequered history without much success so far and so it is good to see that new preparations are being tested.

"The key will be if there is enough pharmaceutical company interest to bring this product to market if their trials are successful.

"Unfortunately, so far, there has been very little pharmaceutical company interest in bringing a male contraceptive pill to the market, for reasons that I don't fully understand but I suspect are more down to business than science."

How to get the most out of your knowledge organiser:

- To get the most use out of the knowledge organisers you should be learning sections and then selftesting.
- There are several different things you can do
 - Look, cover, write, check, correct
 - Read through the organisers
 - Mind maps
 - Key spellings
 - Make a glossary
 - Missing out key words
 - Questions/answers answers/questions
 - Flash cards
 - Revision clock learning
 - Mnemonics

Science Learning Tools and wider study:

The Oak Academy – Online Science lessons BBC Bitesize science <u>You tube channels:</u> Fuse school Ted talks Free science lessons Primrose Kitten <u>Shows on Netfilx</u> Our planet Tiny creatures A life on our planet



Try to answer all of these key knowledge questions. Then check your answers using the last page. These are some of the questions that will be in the knowledge quizzes and the end of term tests.

Key knowledge question	Your answer
What are the three types of	
neurone?	
What is the order of how the	
nervous system works?	
What parts make up the central	
nervous system (CNS)	
Why are reflexes important?	
What hormone is produced if blood	
glucose is too high?	
What is a hormone?	
In what order are the hormones	
released in the menstrual cycle?	
What is ovulation?	
What is the male reproductive	
hormone?	
The monthly hormonal cycle of female	
humans is called the cycle.	
Two muscles working in pairs are called?	
What 4 things does your skeleton/ bones do?	
What do we call 2 or more different	
tissues working together to carry out a	

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* The Lanthanides (atomic numbers 58 – 71) and the Actinides (atomic numbers 90 – 103) have been omitted.

Relative atomic masses for Cu and CI have not been rounded to the nearest whole number.

Inset for GCSE Chemistry (8482), Combined Science: Trilogy (8464), and Cambined Science: Synergy (8465) papers v1



Try to answer all of these key knowledge questions. Then check your answers using the last page. These are some of the questions that will be in the knowledge quizzes and the end of term tests.

Key knowledge question	Your answer						
What are the three types of neurone?	motor neurone, sensory neurone, relay neurone						
What is the order of how the	stimuli, receptor, sensory neurone, CNS, motor						
nervous system works?	neurone, effector, response (this orders only)						
What parts make up the central nervous system (CNS)	Brain and spinal cord						
Why are reflexes important?	to protect you from danger						
What hormone is produced if blood glucose is too high?	Insulin						
What is a hormone?	A chemical that cause a response in the body						
In what order are the hormones released in the menstrual cycle?	FSH, oestrogen, LH, progesterone						
What is ovulation?	The release of a mature egg from the ovary						
What is the male reproductive hormone?	testosterone						
The monthly hormonal cycle of female humans is called the cycle.	The menstrual cycle						
Two muscles working in pairs are called?	Antagonistic						
What 4 things does your skeleton/ bones do?	Structure, movement, protection, making blood cells						
What do we call 2 or more different tissues working together to carry out a function?	An organ						