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**Substrate:** Use the word bank below each paragraph to fill in the blanks in the paragraph above. Write the word in the blank, by using arrows to the answer to see if they make sense in that blank.

Enzymes \_\_\_\_\_ of numerous chemical reactions to play their role. The number of chemical reactions that are required for \_\_\_\_\_ enzymes that will have a large effect on the speed of \_\_\_\_\_ are necessary to speed up the process. These molecules are called \_\_\_\_\_ Enzymes are known as chemical catalysts because they are required to complete or \_\_\_\_\_ up the reaction in different parts of the body.

Indicate speed, complete, enzymes, depend

There are many different types of \_\_\_\_\_ Each enzyme has a specific \_\_\_\_\_ For example, the enzyme \_\_\_\_\_ found in plants, is used to make sugar during photosynthesis. Enzymes are molecules that are \_\_\_\_\_ All protein molecules function as a result of their \_\_\_\_\_ Some conditions are required for enzymes to function properly. For example, an enzyme that works within a specific \_\_\_\_\_ of pH and \_\_\_\_\_ to function properly.

Indicate shape, temperature, protein, range, structure, function



**Disorder:** \_\_\_\_\_

**Gender:** \_\_\_\_\_

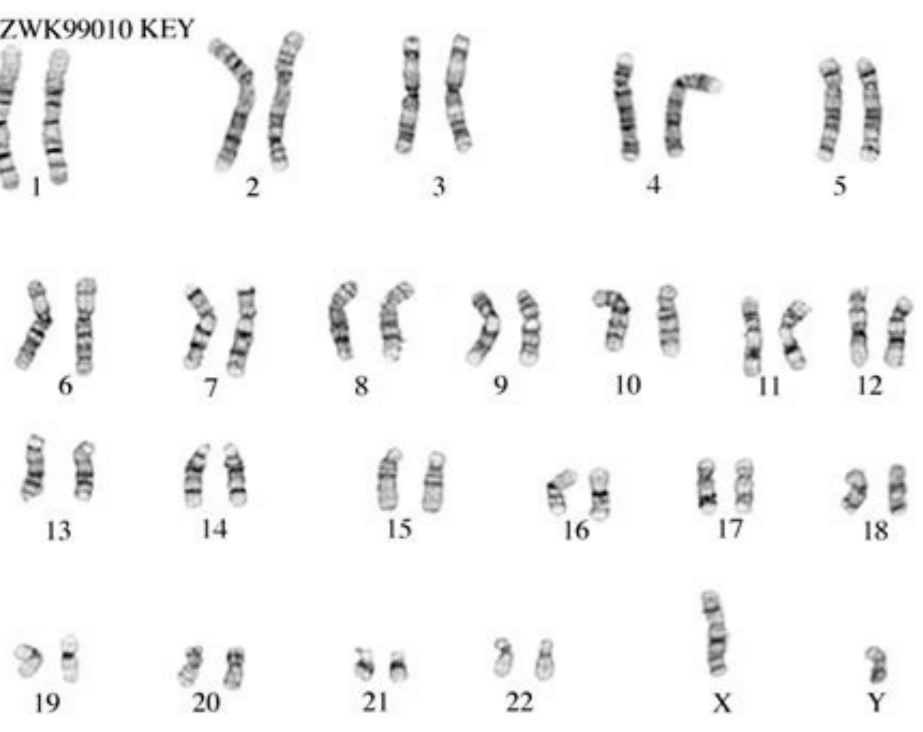
**Circle gender & disorder**

**Disorder:** \_\_\_\_\_

**Gender:** \_\_\_\_\_

**Circle gender & disorder**

4



**Karyotype 1**

1 2 3 4 5

6 7 8 9 10 11 12

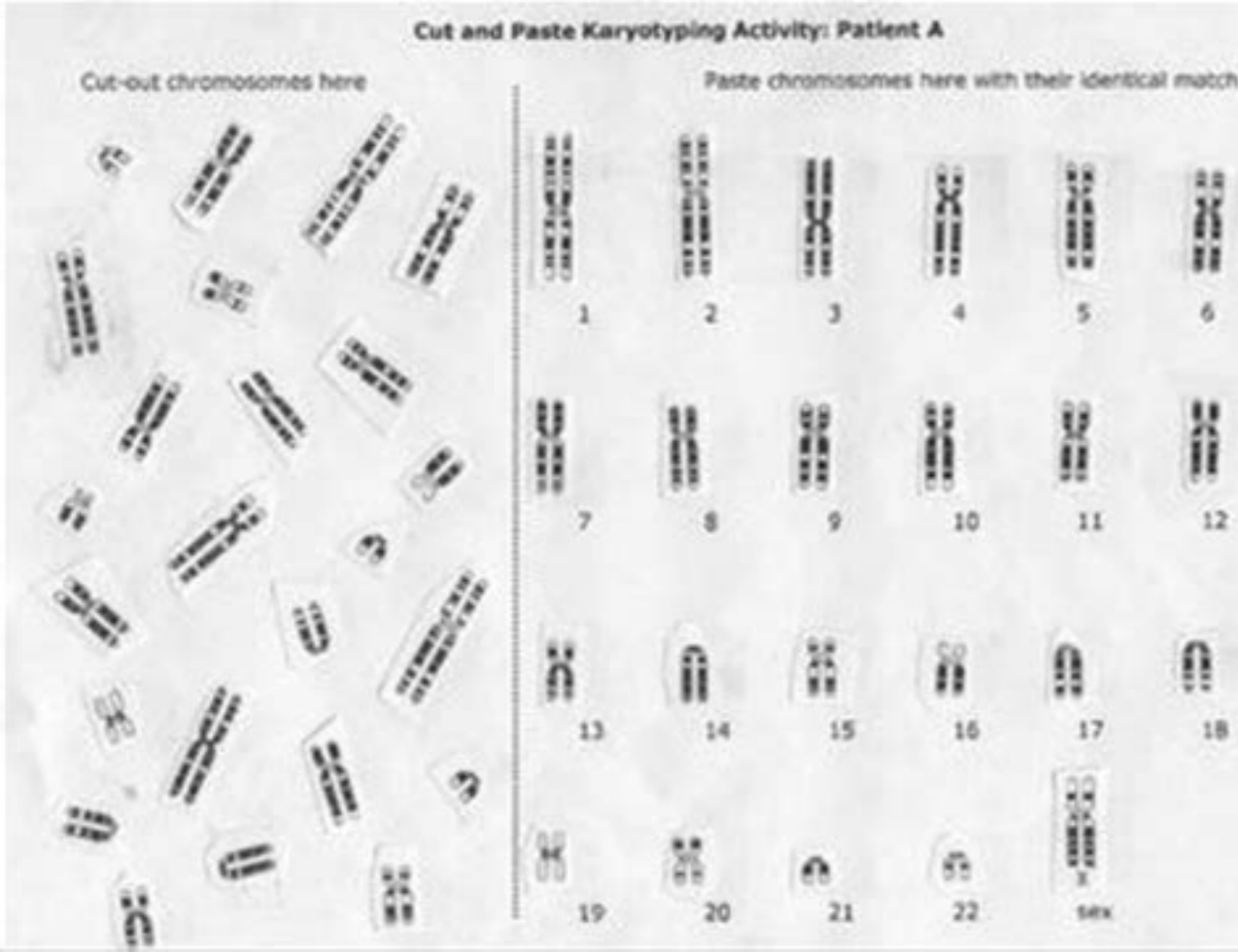
13 14 15 16 17 18

19 20 21 22 X Y

HOME PAGE

**Chromosomes**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 X Y



Karyotyping and chromosomal disorders lab answers. What chromosomal abnormalities can be diagnosed from a karyotype. How to determine genetic disorders through karyotyping. Karyotyping lab answer key. What genetic disorders cannot be detected by karyotyping. Karyotyping answer key.

A karyotype test examines blood or body fluids for abnormal chromosomes. It's often used to detect genetic diseases in unborn babies still developing in the womb. Overview Test Details Results and Follow-Up Karyotype Test Overview Test Details Results and Follow-Up Back To Top A karyotype test uses blood or body fluids to analyze your chromosomes. Chromosomes are the parts of our cells that contain genes, which consist of DNA. You inherit genes from your parents. Genes determine your traits, such as eye and skin color. Most people have 23 pairs of chromosomes (46 chromosomes total). You receive half from your mother and half from your father. But sometimes people are missing chromosomes or have extra chromosomes. Or their chromosomes might be an abnormal size, shape or sequence (order). Unusual chromosomes can mean that you have a genetic disease or disorder. When is a karyotype test needed? Adults may need this type of genetic testing if they: Are having trouble getting pregnant or getting their partner pregnant. Sometimes male or female infertility is the result of a genetic disorder. Have certain cancers or blood disorders. Diseases such as anemia, leukemia, lymphoma or multiple myeloma can change your chromosomes. Finding these abnormalities with karyotyping can guide your treatment. Have a family history of certain genetic diseases. A chromosome analysis can determine if you have abnormal chromosomes and what the chances are of passing them to your children. Unborn babies that are still developing in the womb may need karyotyping if they are at a higher risk of genetic disorders due to: Mothers who are over the age of 35 when they get pregnant. Parents with genetic disorders or family histories of genetic disorders. If a baby dies late in a pregnancy or during birth, a karyotype test can determine if a genetic disorder may have been the cause of death. Infants or young children may need a chromosome analysis if they show signs of a genetic disorder. There are many genetic disorders, each with different symptoms. Who performs a karyotype test? Different types of healthcare providers may take blood or fluid samples depending on the karyotype test you need. Pathologists (healthcare providers who study blood and tissues) or geneticists with training in chromosome analysis examine the blood or fluid in a lab. Most people don't need to do anything to prepare for a karyotyping test. If you have had recent blood transfusions, be sure to ask your healthcare provider if you need to wait before doing the test. In some cases, your healthcare provider may want you to fast (not eat or drink) before the test. Be sure to ask your provider if there are any instructions you should follow or medications to avoid before your test. Some people choose to talk with a genetic counselor before having a karyotype test. The results of a test can have profound emotional effects. This is especially true for parents who may find out their baby has a genetic disorder. Having this type of test is entirely your choice, so it's important to weigh the risks and benefits before making a decision. Are there different types of karyotype tests? Karyotype tests can take several forms: Blood test, which is the most common way to perform chromosome testing in adults, infants and children. Bone aspiration and biopsy, which tests a sample of bone marrow in people with certain cancers or blood disorders. Amniocentesis, which takes a sample of amniotic fluid (the protective fluid surrounding a baby in the womb) from around a developing fetus (unborn baby). Chorionic villus sampling (CVS), which takes a sample of cells from the placenta. This is an organ that develops in the womb during pregnancy to provide oxygen and nutrients to the fetus. What happens during a karyotype blood test? The process to get blood for a standard karyotype test only takes a few minutes. You may get the test at your healthcare provider's office, a hospital or a lab. A healthcare provider called a lab technician usually takes blood samples. Here's what you can expect: The lab technician takes blood from a vein in your arm using a thin needle. You might feel a light stick and some mild discomfort. They fill a collection tube with blood and then remove the needle. They place a small bandage on your arm. A healthcare provider who specializes in cancer (an oncologist) or blood disorders (a hematologist) usually performs a bone marrow aspiration and biopsy. It might happen in a hospital, clinic or healthcare provider's office. Here's what you can expect: Some people receive sedation before a bone marrow test to help them relax. You lie on your side or your stomach. Your healthcare provider injects the area (usually the top of your hip bone) with a local anesthetic so you feel less pain during the procedure. For the bone marrow aspiration, your healthcare provider inserts a thin needle through the bone and takes out a sample of bone marrow fluid. For the biopsy, they remove a sample of solid bone marrow tissue. You may feel some pain or pressure during the procedure. What happens during amniocentesis? If you choose to have an amniocentesis, it's usually done 15 to 20 weeks into a pregnancy. A healthcare provider specializing in complex pregnancies (maternal-fetal medicine specialist) usually performs amniocentesis. It might happen in a hospital, clinic or doctor's office. Here's what you can expect: You lie on your back and your healthcare provider performs a pregnancy ultrasound. The ultrasound helps them see the inside of your womb and the fetus. They use the ultrasound to guide a thin needle through your belly and womb, being careful not to harm the baby. The needle goes into the amniotic sac (thin membrane around the fetus that contains the amniotic fluid). You may receive some numbing medication on your skin before they insert the needle. Your healthcare provider takes a sample of amniotic fluid and then removes the needle. You might feel some stinging or cramping during the procedure. What happens during chorionic villus sampling (CVS)? If you choose to have chorionic villus sampling (CVS), the test usually happens 10 to 13 weeks into a pregnancy. Similar to amniocentesis, a maternal-fetal medicine specialist performs the procedure in a hospital, clinic or doctor's office. Based on the result of an ultrasound, your healthcare provider may recommend transcervical CVS or transabdominal CVS. The transcervical approach accesses your placenta by inserting a catheter (thin, flexible tube) into your cervix (a tube between the uterus and vagina). The transabdominal technique inserts a needle through your belly to take cells from the placenta. This procedure is similar to an amniocentesis. Here's what you can expect: You lie on your back and your provider performs a pregnancy ultrasound. The ultrasound helps them see the inside of your womb and the fetus. They use the ultrasound to guide a catheter through your cervix or a needle through your belly to reach your placenta. Your healthcare provider takes a sample of cells from the placenta. You might feel some pressure during the procedure. Talk to your healthcare provider about whether CVS or amniocentesis is the right prenatal karyotype test for you. Each test has different risks and benefits. Are there any risks with a karyotype test? There are no significant risks with a blood test, but you might experience: Bruising. Light bleeding where the needle went into your vein. Soreness on the inside of your arm. Risks of a bone marrow aspiration and biopsy include: Bleeding. Bruising. Infection. Pain or soreness at the injection site. Tingling in your legs. Risks of amniocentesis or CVS include: Bleeding. Cramping. Infection in the uterus. Miscarriage (about 1 out of 100 women have a miscarriage after CVS; less than 1 in 200 have a miscarriage after amniocentesis). Virus transmission (this is rare; if you have a virus and your blood mixes with your baby's blood during the procedure, they may get the virus). You may need to wait a few weeks for the result of your karyotype test, though it could take more or less time. Ask your healthcare provider about when you can expect your results. What do karyotype test results mean? Abnormal karyotype test results could mean that you or your baby have unusual chromosomes. This may indicate genetic diseases and disorders such as: Down syndrome (also known as trisomy 21), which causes developmental delays and intellectual disabilities. Edwards syndrome (also known as trisomy 18), which causes severe problems in the lungs, kidneys and heart. Patau syndrome, which causes poor development in the womb and low birth weight. Turner syndrome, which prevents girls and women from developing female characteristics. A note from Cleveland Clinic A karyotype test examines blood or body fluids for abnormal chromosomes. Adults, children or babies still in the womb may need this test if they're at risk for certain genetic conditions. Before choosing to have a karyotype test, talk with your healthcare provider about genetic counseling. Counseling can help you weigh the risks and benefits of chromosome analysis. Last reviewed by a Cleveland Clinic medical professional on 06/03/2021. References American Pregnancy Association. Chorionic Villus Sampling: CVS. ( Accessed 5/24/2021. Cancer Research UK. Bone marrow test. ( Accessed 5/24/2021. March of Dimes. Amniocentesis. ( Accessed 5/24/2021. MedlinePlus. Karyotype Genetic Test. ( Accessed 5/24/2021. Get useful, helpful and relevant health + wellness information enews Cleveland Clinic is a non-profit academic medical center. Advertising on our site helps support our mission. We do not endorse non-Cleveland Clinic products or services. Policy

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