

A CHROMOSOME STUDY

In this activity, you will create a karyotype from a page of mixed chromosomes. Karyotypes are created by matching homologous pairs and numbering them from largest to smallest. Abnormalities, such as extra or deleted chromosomes can then be diagnosed. Pictured chromosomes will be used for this model rather than real chromosomes, but the process is the same for real chromosomes extracted from cell or fetal samples.

Two karyotypes will be created - A karyotype is a pattern or picture of chromosomes from one cell **grouped into pairs** and **organized by size**. The first you will create represents a normal human karyotype of a male or a female, the second represents and abnormal karyotype. You will then compare and diagnose the abnormality present in the patient of the second karyotype.



Normal Human Karyotype

- Obtain the page marked "normal" - these are pictures of chromosomes from a normal human.
- Cut each chromosome out and set the ones labeled X & Y aside.
- Pair each chromosome up with its match - the X & Y will not match.
- Arrange the chromosomes in pairs from largest to smallest. **NUMBER** them starting from one.
- Place the sex chromosomes last, at the #23 spot.

1. How many total chromosomes are present in this karyotype? _____

2. How many sex chromosomes are present? _____

How many autosomes (not sex chromosomes)? _____

3. What is your person's sex chromosomes (XX or XY)? _____ Is this a boy or girl? _____

Body cells are called somatic cells. Somatic cells include the skin, liver, muscle, stomach and other bodily cells. The karyotype you prepared is from a somatic human cell. The term **diploid chromosome number** refers to the number of chromosomes in a somatic cell. The diploid number varies from species to species, however it does not differ from somatic cell to somatic cell within the same organism. To find your diploid number, simply count the number of chromosomes in your karyotype.

4. What is the diploid chromosome number for your karyotype? _____

The **HAPLOID CHROMOSOME NUMBER** refers to the number of chromosomes in an organism's sex cells. Sperm in males, eggs in females. The **haploid number**, is always -half- that of the diploid number.

5. What would the haploid chromosome number for your karyotype be? _____

Abnormal Human Karyotype

- Obtain the page marked "abnormal" - there is more than one set, take note of which set you have (A, B, C, D) → _____
- Cut each chromosome out and set any labeled ones (X, Y) aside.
- Pair each chromosome up with its match - the X & Y will not match.
- Arrange the chromosomes in pairs from largest to smallest. **NUMBER** them starting from one.
- Place the sex chromosomes last, at the #23 spot.

Lab 21 A Chromosome Study Answer Key

Katrin Zwirgmaier



Lab 21 A Chromosome Study Answer Key:

Handbook of Autopsy Practice Jurgen Ludwig, 2002-07-18 The second edition of *Handbook of Autopsy Practice* appeared in 1979 under the title *Current Methods of Autopsy Practice* W B Saunders Company that edition was out of print in the early 1980s Now over 20 years later it appeared timely to thoroughly update the material in a third edition by adding what we have learned in the meantime and eliminating text that has become obsolete There is an acute need for a complete and readily accessible resource for autopsy work because few pathologists still specialize in autopsy practice and as a consequence expertise in autopsy technology and autopsy pathology has declined Our colleagues in the forensic field have remained the only large group of autopsy practitioners For most other pathologists the economic situation time constraints and the steadily decreasing autopsy rates have made a career in autopsy pathology unattractive This state of affairs is perpetuated by a lack of interest among many of our young colleagues partly because the teaching of autopsy pathology and autopsy techniques during most residencies is insufficient Numerous articles have been written about this situation but the trend I fear is irreversible Still autopsies will be requested particularly in complex and difficult situations where the questions remaining after the death of the patient might challenge even experienced autopsy pathologists Under these circumstances this *Handbook of Autopsy Practice* should meet a particular need by providing the prosecutor with a source of information when it is most required in the autopsy room

Handbook of Autopsy Practice Brenda L. Waters, 2010-05-19 *Handbook of Autopsy Practice* Fourth Edition is divided into three parts Part I contains six new chapters in which the reader will find an assortment of tools that will increase the value of the autopsy Included in the section are valuable resources and tools such as a sample next of kin letter a quality assurance worksheet new discourse on the dissection procedure which is accompanied by a worksheet and template for the gross description There is also a new detailed discussion of the safe handling of sharps complete with photographs and the reader will also find the updated requirements of the Eye Bank of America and the U S Food and Drug Administration for ocular tissue transplantation Part II has been updated with new diseases and recent references added Practicing autopsy pathologists residents and students are invited to review this alphabetical listing of disorders before each autopsy in order to reacquaint themselves with what they might encounter Part III provides a series of tables providing organ weights and body measurements for fetuses children and adults *Handbook of Autopsy Practice* Fourth Edition is an essential resource for clinicians pathologists residents and students who strive to hone their trade and increase the value of the autopsies they perform

The AGT Cytogenetics Laboratory Manual Marilyn S. Arsham, Margaret J. Barch, Helen J. Lawce, 2017-04-24 Cytogenetics is the study of chromosome morphology structure pathology function and behavior The field has evolved to embrace molecular cytogenetic changes now termed cytogenomics Cytogeneticists utilize an assortment of procedures to investigate the full complement of chromosomes and or a targeted region within a specific chromosome in metaphase or interphase Tools include routine analysis of G banded chromosomes specialized stains that

address specific chromosomal structures and molecular probes such as fluorescence in situ hybridization FISH and chromosome microarray analysis which employ a variety of methods to highlight a region as small as a single specific genetic sequence under investigation The AGT Cytogenetics Laboratory Manual Fourth Edition offers a comprehensive description of the diagnostic tests offered by the clinical laboratory and explains the science behind them One of the most valuable assets is its rich compilation of laboratory tested protocols currently being used in leading laboratories along with practical advice for nearly every area of interest to cytogeneticists In addition to covering essential topics that have been the backbone of cytogenetics for over 60 years such as the basic components of a cell use of a microscope human tissue processing for cytogenetic analysis prenatal constitutional and neoplastic laboratory safety and the mechanisms behind chromosome rearrangement and aneuploidy this edition introduces new and expanded chapters by experts in the field Some of these new topics include a unique collection of chromosome heteromorphisms clinical examples of genomic imprinting an example driven overview of chromosomal microarray mathematics specifically geared for the cytogeneticist usage of ISCN s cytogenetic language to describe chromosome changes tips for laboratory management examples of laboratory information systems a collection of internet and library resources and a special chapter on animal chromosomes for the research and zoo cytogeneticist The range of topics is thus broad yet comprehensive offering the student a resource that teaches the procedures performed in the cytogenetics laboratory environment and the laboratory professional with a peer reviewed reference that explores the basis of each of these procedures This makes it a useful resource for researchers clinicians and lab professionals as well as students in a university or medical school setting

Cytogenetic Laboratory Management Susan Mahler Zneimer, 2016-11-21 Cytogenetic Laboratory Management Cytogenetic Laboratory Management Chromosomal FISH and Microarray Based Best Practices and Procedures Cytogenetic Laboratory Management Chromosomal FISH and Microarray Based Best Practices and Procedures is a practical guide that describes how to develop and implement best practice processes and procedures in the genetic laboratory setting The text first describes good laboratory practices including quality management design control of tests and FDA guidelines for laboratory developed tests and preclinical validation study designs The second focus of the book is on best practices for staffing and training including cost of testing staffing requirements process improvement using Six Sigma techniques training and competency guidelines and complete training programs for cytogenetic and molecular genetic technologists The third part of the text provides stepwise standard operating procedures for chromosomal FISH and microarray based tests including preanalytic analytic and postanalytic steps in testing which are divided into categories by specimen type and test type All three sections of the book include example worksheets procedures and other illustrative examples that can be downloaded from the Wiley website to be used directly without having to develop prototypes in your laboratory Providing a wealth of information on both laboratory management and molecular and cytogenetic testing Cytogenetic Laboratory Management will be an essential tool for laboratorians

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Government-wide Index to Federal Research & Development Reports, 1966 **NBS Special Publication**, 1968

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