SAWA UNIVERSITY

اسم المادة و الكورس

LAB. 6 CHROMOSOME STRUCTURE AND CYTOGENETIC MAPPING

Sawa University — جامعـــــة ســـــــاوة الاهلية

College of health and medical techniques — كليـــــة التقنيـــات الصحيـة والطبيـة

Department of Medical Laboratories — قسم تقنيات المختبرات الطبية

Third Stage — المرحلـــــــــــة الثالثة

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محاضرة رقم 6

Lecture No. 6

الجانب العملي:الوراثة الطبية

Medical genetics-Practical

Objectives of Banding

MEDICAL GENETICS LAB.

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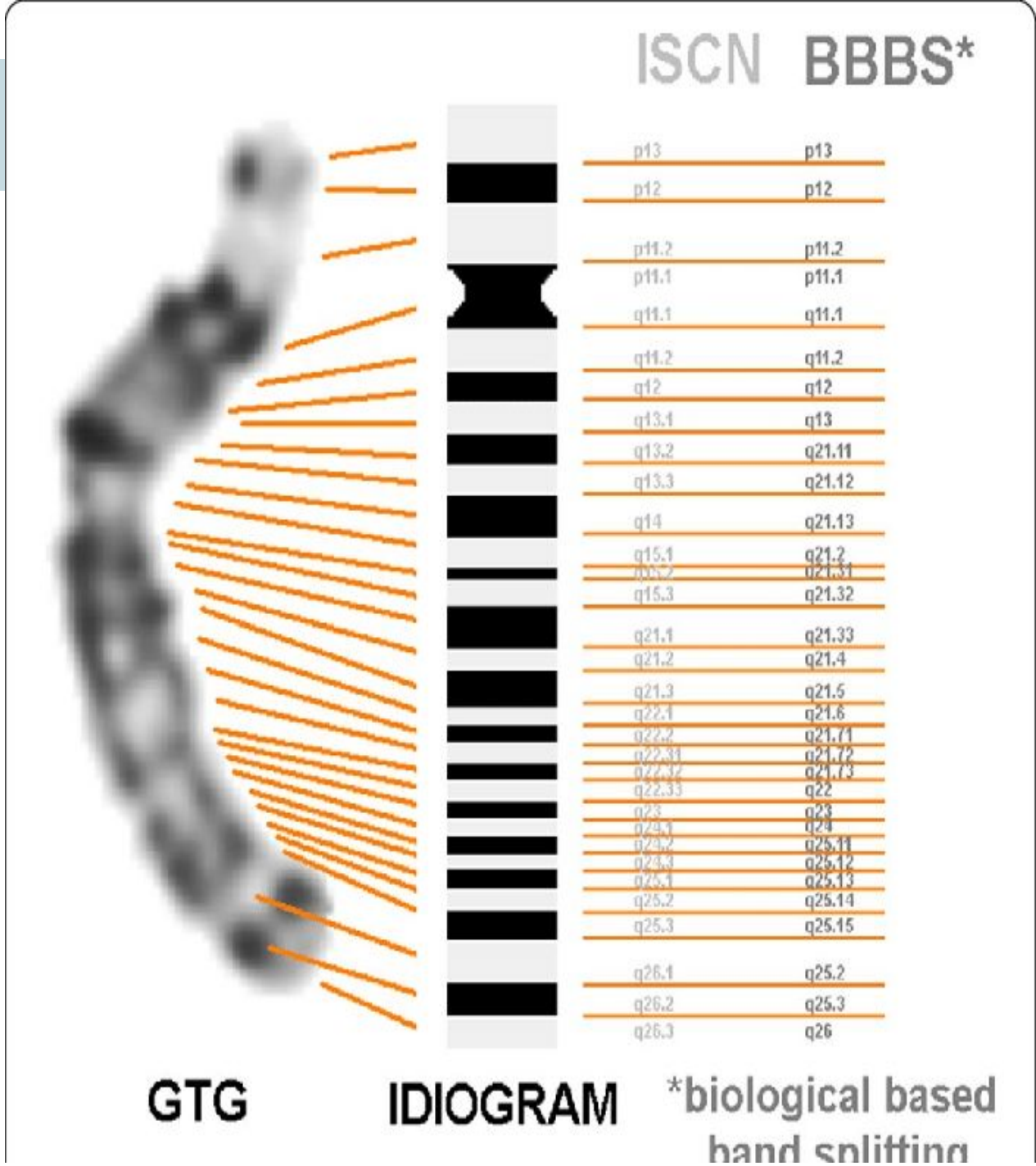
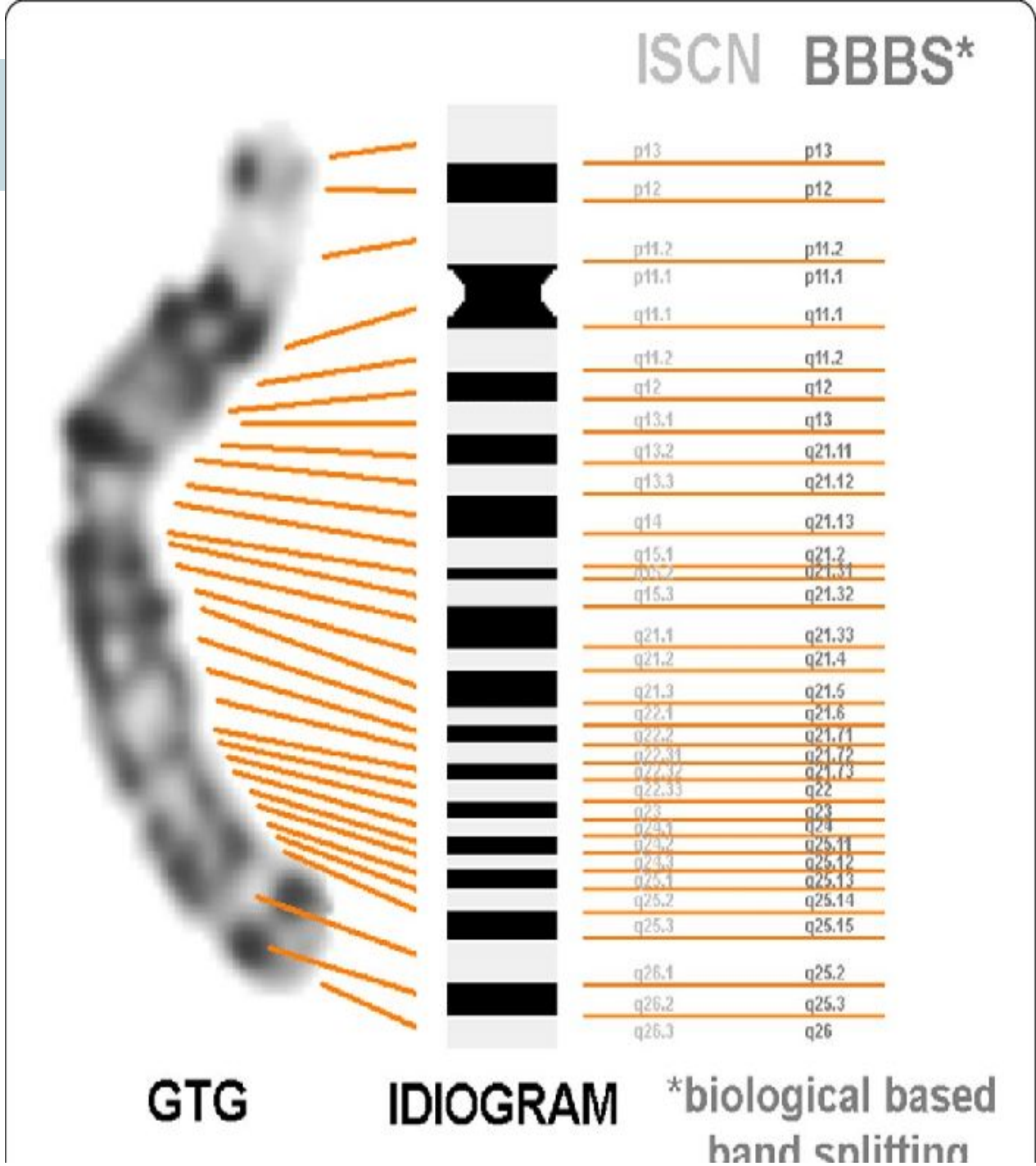


Objectives of Banding

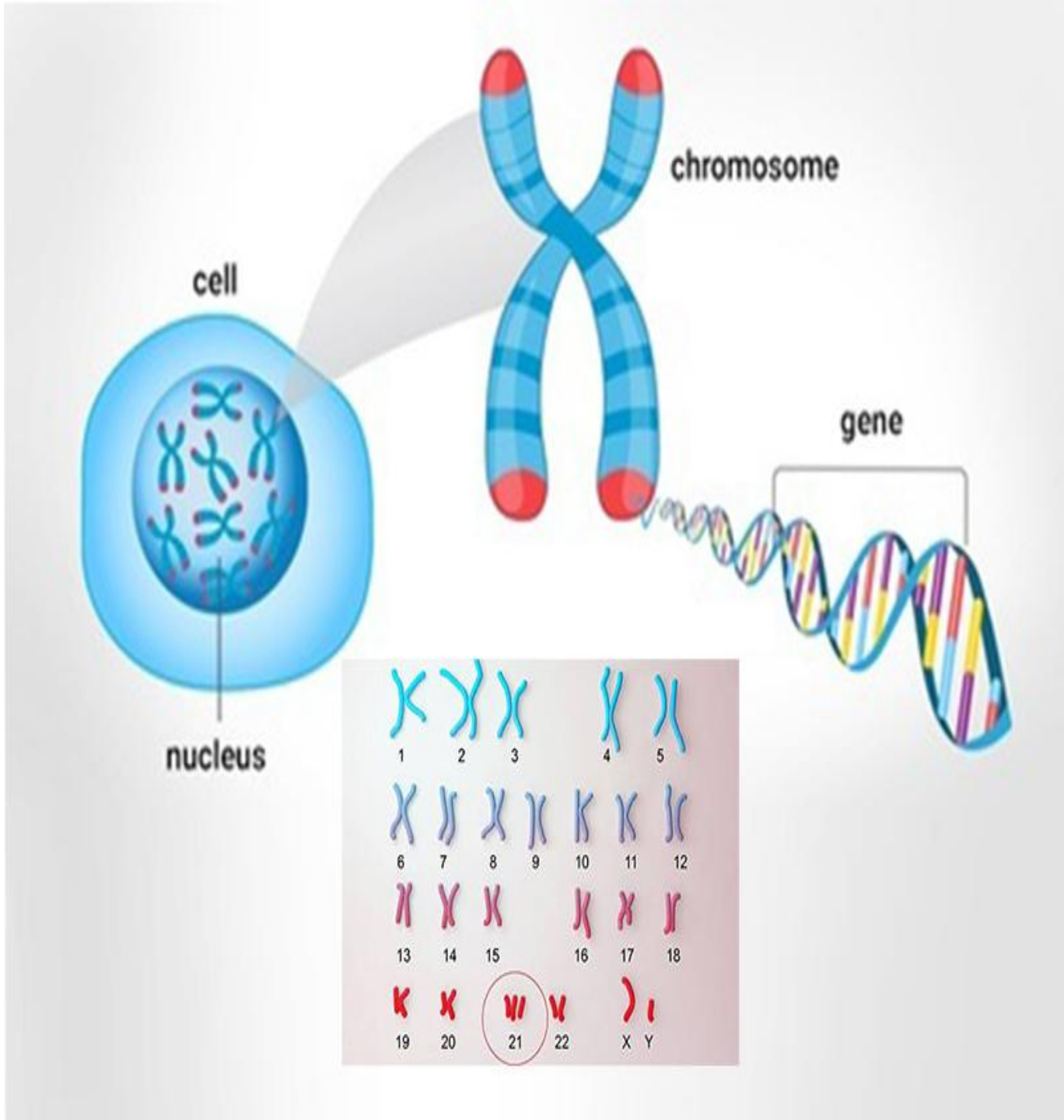
By the end of this lab, students should be able to:

1. **Describe the principle of chromosome banding.**
2. **Identify major banding techniques (G, Q, R, C, T, NOR).**
3. **Differentiate between the staining mechanisms of each type.**
4. **Explain the diagnostic applications of banding in medical genetics.**



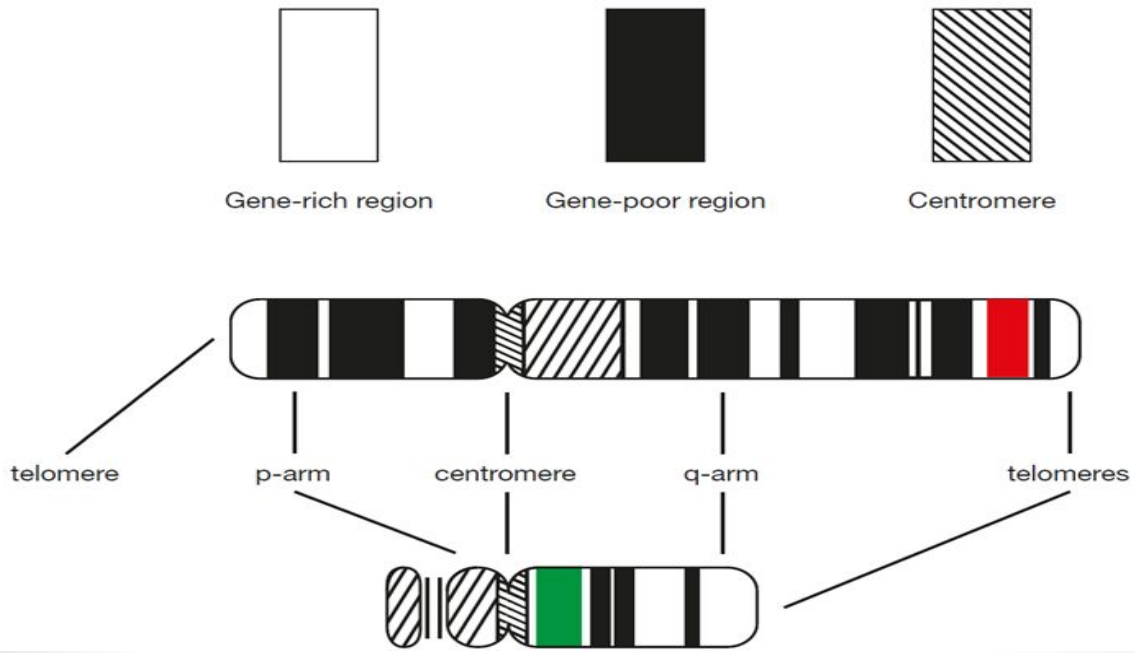
Introduction

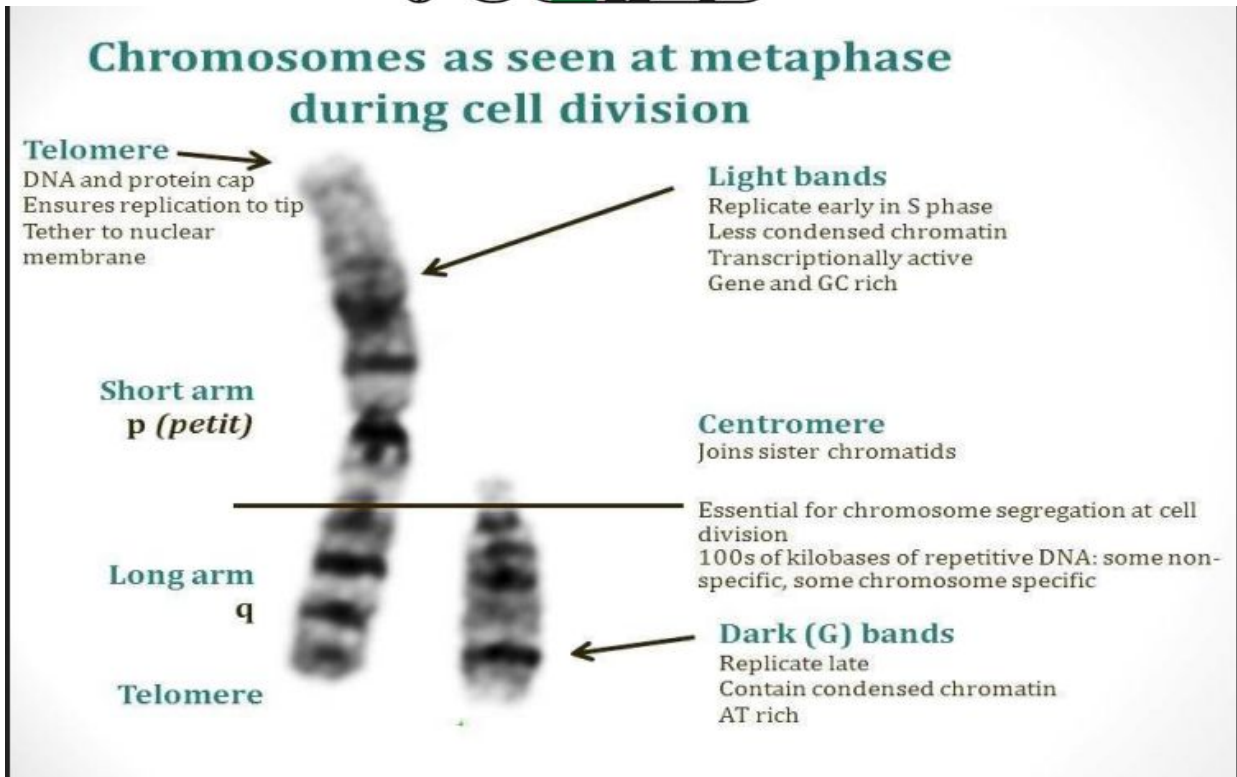
- **Chromosome banding is a cytogenetic technique used to produce a characteristic pattern of light and dark bands along the length of chromosomes. These banding patterns allow the precise identification of individual chromosomes, detection of structural abnormalities, and accurate karyotyping.**
- **Each technique produces a distinct banding pattern based on differences in DNA composition, chromatin structure, and staining properties.**

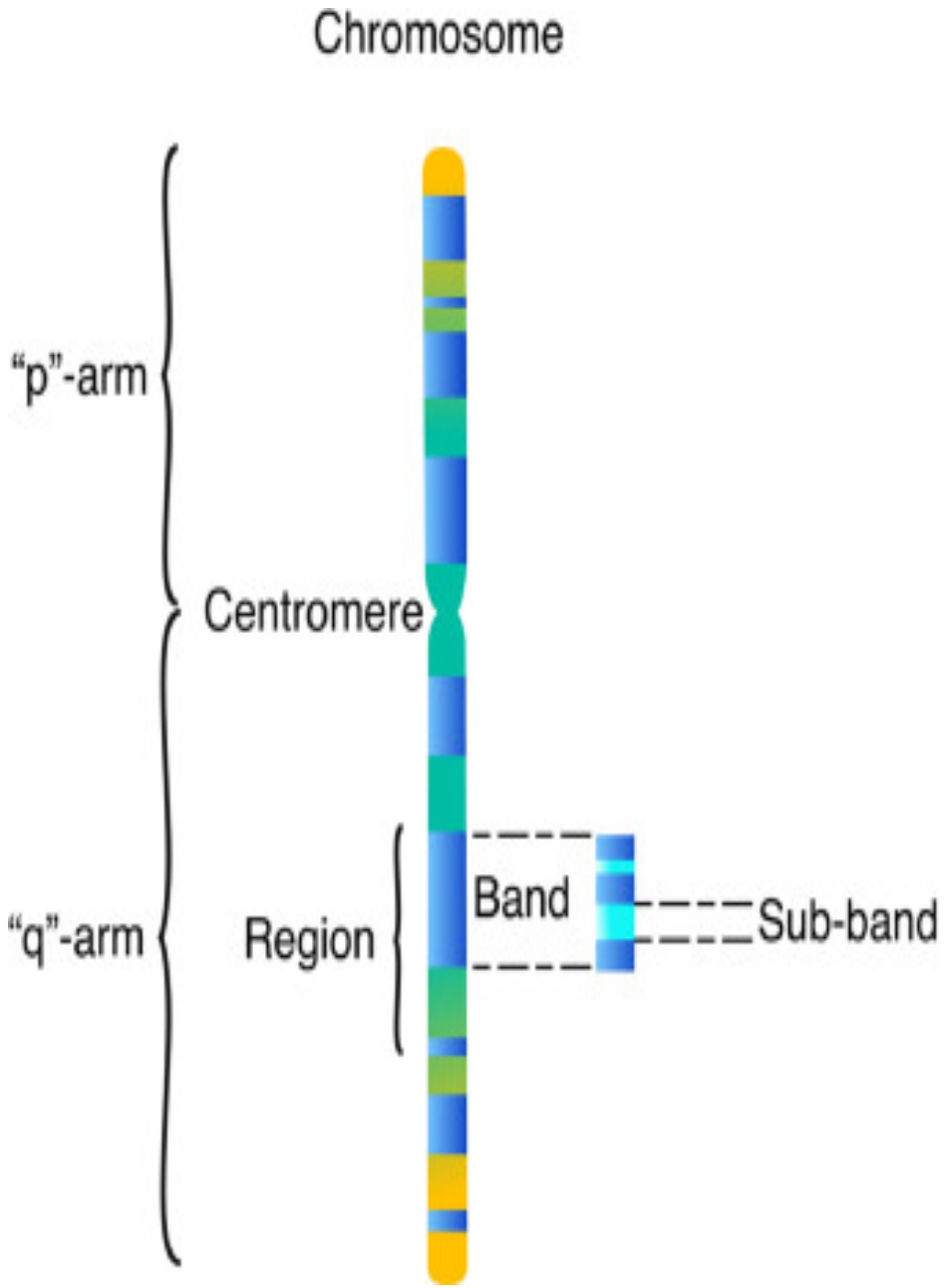


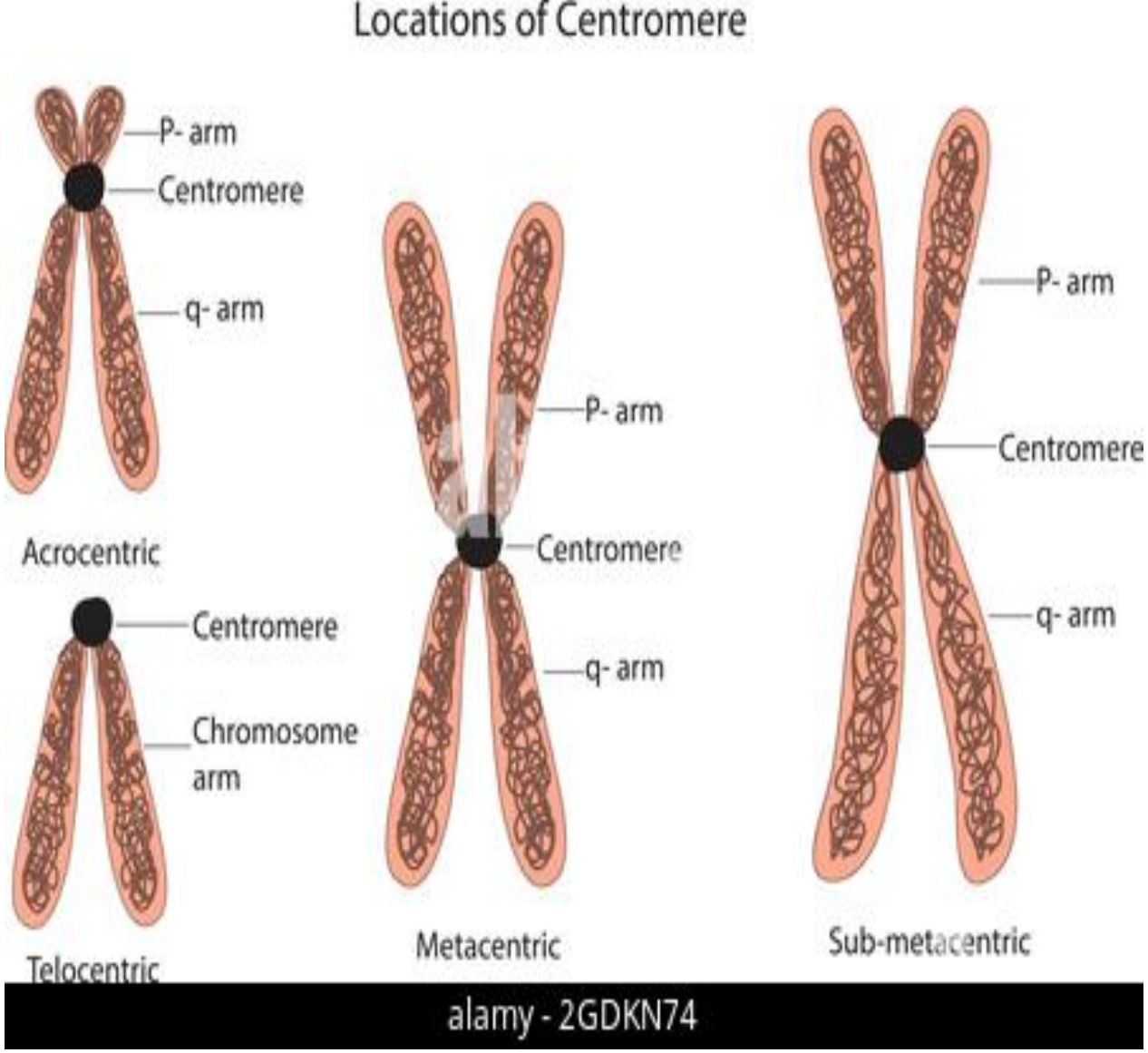
Principle of Chromosome Banding

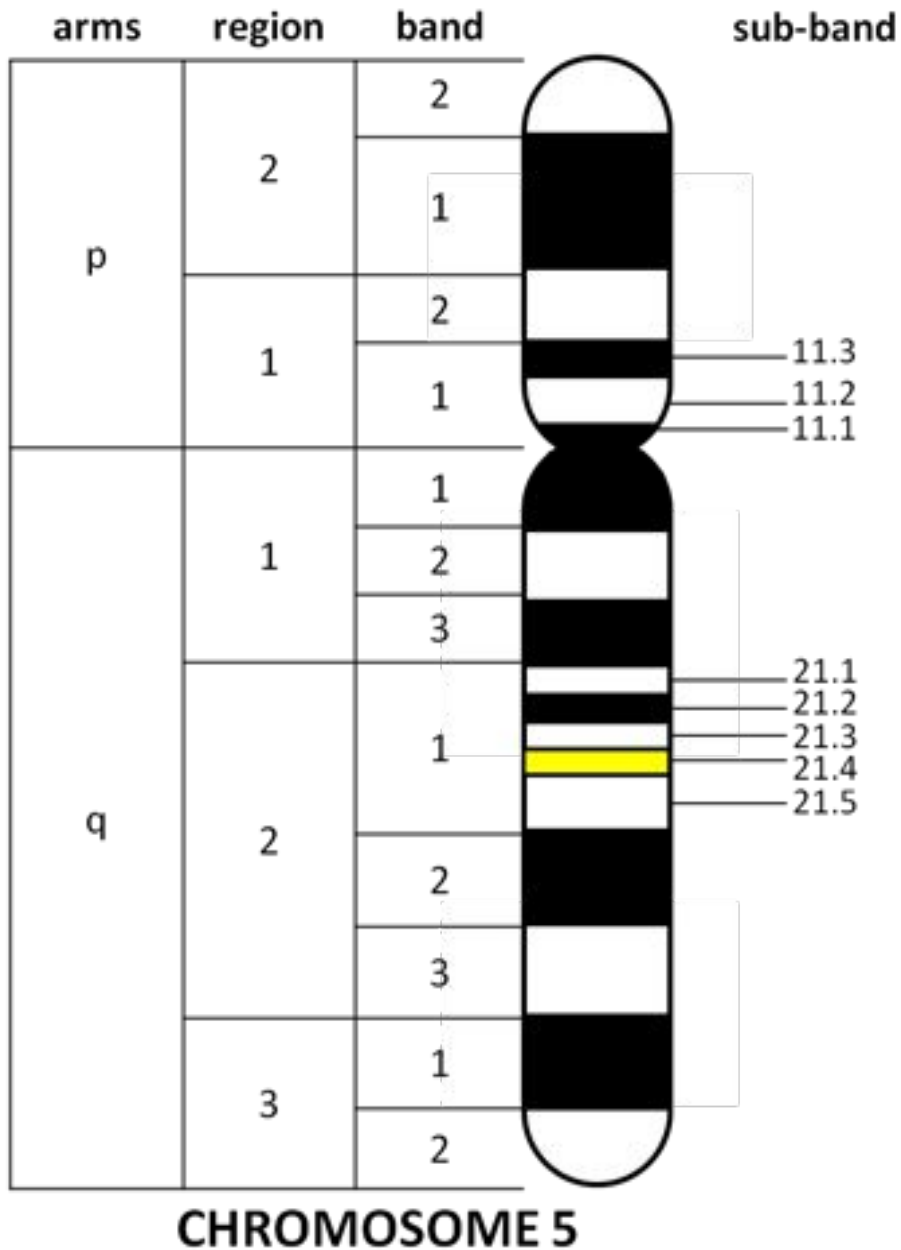
- **Banding techniques rely on the differential staining of chromosomal regions depending on DNA base composition (AT- or GC-rich regions) and chromatin condensation.**
- **Dark bands (G-positive): AT-rich, gene-poor, late-replicating heterochromatin.**
- **Light bands (G-negative): GC-rich, gene-dense, early-replicating euchromatin.**
- **The alternation of these bands forms a unique fingerprint for each chromosome.**





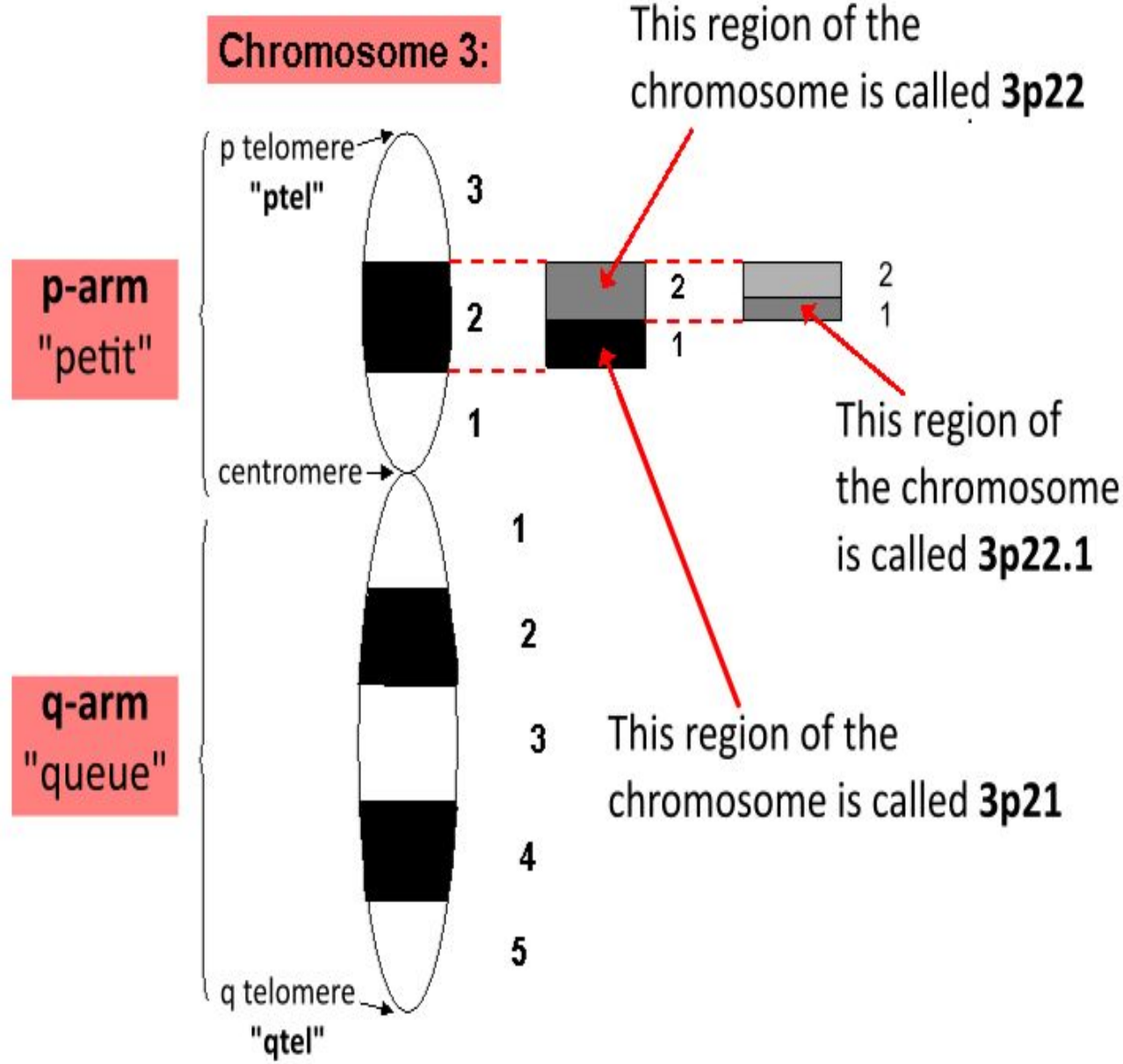

Chromosome
"p"-arm
Centromere
"q"-arm
Region
Band
Sub-band


Locations of Centromere
P- arm
Centromere
q- arm
Acrocentric
Centromere
Chromosome arm
Telocentric
P- arm
Centromere
q- arm
Metacentric
P- arm
Centromere
q- arm
Sub-metacentric
alamy - 2GDKN74



CHROMOSOME 5

Cytogenetic Banding Nomenclature



QUIZ

Q1. Interpret the cytogenetic location

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Q2. Make a simple comparison between the types of chromosome bandings ?

Any questions?