Molecular Biology Curriculum for Master students

*By Dr. Ahmed Sahib*

1. Lecture 1

-introduction

-DNA replication

- mechanisms of replication

-telomeres and telomerase

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2. Lecture 2

-Gene expression introduction

- mechanisms of gene expression

- gene expression control for eukaryotics and prokaryotics

- Post-translational proteins folding

- Operons

3. Lecture 3

- Microbial genetics introduction

- concept ofallelic variation

- The in-lab auxotrophic and prototrophic selection of mutant cells

-transformation

-Conjugation

-Transduction

- chromosomal mapping in bacteria and in bacteriophages

4.Lecture 4-5

- Molecular biology applications and tests (introduction)

- gel electrophoresis

- RFLP

-PFGE

- restriction endonucleases

- Hybridization techniques

-microarrays

- Gene cloning

- Gene cloning

5. Lecture 6

- traditional PCR principles

- traditional PCR mechansisms

- traditional PCR optimization (full set of maneuvers)

-Real-time PCR

- Quantification using real-time PCR

- Reverse transcriptase real-time PCR

6. Lecture 7

Mutation detection techniques

By Dr. Maysaa Abdulrazak

Lecture

1 DNA methylation and gene expression regulation

2 Genomic imprinting

3 Protein non-coding RNAs

4 Genetic variation and DNA markers

5 Introduction to Cytogenetic and Cytogenetic abnormalities

6 Molecular biology of Mitochondrial DNA