Home tasks guide of **Molecular-biochemical markers of plants to disease resistance**

Home task 1. The major approaches and methods to study the biochemical markers of plants to disease resistance

Protocol of extraction of DNA from plant cells;

1. Mechanism of defense functions of phenols, sugars, amino acids
2. Protocol of determinations of phenols, sugars, amino acids,
3. Mechanism of defense functions of phytoalexin
4. Methods of phytoalexin determinations

Home task 2

1. The major approaches of study of pathogenesis-related proteins (PR).
2. Mechanism of defense functions of plants cell wall lignifications and activation of oxidative enzymes in host plant.
3. Methods of cell wall lignin and oxidative enzymes determinations

Home task 3 **Molecular markers of plants to disease resistance**

1. Review of Molecular Techniques to Assess Plant resistance
2. Markers such as random amplified polymorphic DNA (RAPD), amplified

fragment length polymorphism (AFLP) and microsatellites.

1. Different types of endonucleases and their use in molecular biotechnology.
2. KASP molecular marker and its steps of applications

Home task 4 New generation of **molecular markers of plants to disease resistance**

1. DNA sequencing is the determination of the order of the nucleotide bases-A (adenine), G (guanine), C (cytosine) and T (thymine) present in a target molecule of DNA.
2. Next Generation Sequencing Techniques
3. AFLP molecular marker and its steps of applications
4. SSR molecular marker and its steps of applications
5. RAPD molecular marker and its steps of applications
6. QTL applications

Home task 5 Types of PCR and their applications

1. Protocols of Real-Time PCR
2. Protocols *Allele-specific PCR*
3. Protocols *Convective PCR*
4. Protocols of *Asymmetric PCR*
5. Protocols of *Dial-out PCR*
6. Applications of fluorescence in situ hybridization (FISH) in detecting genetic aberrations of medical significance.
7. Major features of primers design.
8. Genetic and physical mapping
9. DNA library

# Home task 6. CRISPR gene editing applications l

1. Targeted gene mutation
2. Creating chromosome rearrangement
3. Study gene function with stem cells
4. Transgenic resistant plants
5. Endogenous gene labeling
6. Targeted transgene addition