

# **MOLECULAR ASPECTS OF THE RELATIONSHIP OF PLANTS AND THEIR PARASITES**

## **Department of plant protection**

<i>Academic term</i>	<b>2</b>
<i>Higher Educational Level</i>	<b>The third (educational and scientific)</b>
<i>Number of ECTS credits</i>	<b>4</b>
<i>Form of control</i>	<b>credit</b>
<i>Audit hours</i>	<b>120 (12hrs.of lectures, 24 hrs. of practical classes, 84 hrs. of individual work )</b>

### **A general description of the discipline**

Course program Molecular Aspects of Plant Interactions and Their Parasites aims to help postgraduate students to acquire knowledge in the interaction between plant life and plant pathogens. Today modern science deals with genes of plant resistance and genes of pathogenicity of pathogens of diseases and their products. The issues of their operation and signalling system are also learnt. The course consists of the following parts: features of the interaction of pathogens and plants, pathogenesis of infecting plants with pathogens, horizontal pathosystem, vertical pathosystem, active plant response to pathogens attack.

### **Topics for learning:**

Types of interaction between microorganisms and plants.  
Features of phytopathogens.  
Pathological process in the affected plant.  
Parasite attack factors.  
Factors of plant resistance. Resilience of genes and their products  
Signal transduction.

### **Topics of practical classes:**

#### **(seminars, practical and laboratory classes)**

Determination of the type of parasitism of microorganisms.  
Determination of type of trophism in microorganisms.  
Determination of the type of specialization of phytopathogens.  
Study of the ways of penetration of plant pathogens into plants.  
Study of enzymes and features of their formation by microorganisms.  
Study of toxins and features of their formation by microorganisms.  
Determination of incubation period of pathogens depending on the meteo conditions.  
Study of features of phytohormone formation during pathogenesis.  
Study of the effect of waxy bloom on the infection of wheat plants with powdery mildew (*Erysiphe graminis f. Tritici*).  
Study of amylase activity of fungi of the genera *Alternaria* and *Fusarium*.

Influence of volatiles on the growth and development of fungi on nutrient media.

Study of abiotic elicitors.

Study of nonspecific suppressors.

Study of the types of non-specific biogenic elicitors.

Study of the effectiveness of immunocytophyte administration.

Study of avirulence genes of bacteria.

Study of genes of fungi avirulence.

Study of phytoalexin activity of potato tubers with different plant resistance.

Study of hypersensitivity reaction for wheat rust.

Study of the structure of genes of plant resistance.

The search of information about resistance of genes in different plants, skills how to use databases.

Study of virulence genes.