Methods of higher plants culture *in vitro*

1. Lecturer: Avksentyeva Olha Oleksandrivna, associate professor of the department of plant and microorganism physiology and biochemistry.
2. Status: optional for bachelors.
3. Course, semester: 4th academic year, 8th semester.
4. Number of credits – 4, general academic hours – 144, lab practice – 68, self-study – 76.
5. Preliminary requirements: basics of Plant Anatomy, General Cytology, Microbiology, Genetics, Biology of Individual Development, Plant Physiology and Biochemistry, Biotechnology
6. Description of the course: a specialized practical course "Methods of higher plants culture *in vitro*" provides practical skills in the cultivation of plant cells, tissues and organs *in vitro*. Students study the basic principles and methods of work in the laboratory *in vitro* culture of plant cells, tissues and organs; plant organisms as objects for biotechnology, types of plant cultures *in vitro* (callus, suspended cells, isolated protoplasts, haploid cells etc). Also there are considered applied aspects of the theoretical bases of plant cultivation *in vitro* in the practice of modern biotechnology.

   Sections: Basic principles of work in laboratory of higher plants culture *in vitro*, types of cultures *in vitro*, modern plant biotechnology.
   Knowledge and skills:
   - Knowledge of the development, establishment and modern methods of higher plants culture *in vitro*;
   - Knowledge of terminology (conceptual apparatus of modern plant biotechnology);
   - Understanding of features of plant organism as an object for biotechnology:
   - Knowledge of the types of higher plant cultures *in vitro*;
   - Ability to organize the work of the laboratory of culturing plant cells, tissues and organs *in vitro*;
   - Ability to implement sterilization of plant materials;
   - Input of plant objects into the culture *in vitro* using different types of explants;
   - Ability to carry out the work in a laminar box;
   - Ability to investigate calli and suspended cells;
   - Ability to carry out a plant propagation
7. Course organization: lectures and seminars. Forms of control: tests, defense of laboratory works, final test.
8. Language: Ukrainian.
9. Educational and methodological support: program, schedule of classes, topics of seminars, educational and scientific literature, multimedia presentations, methodical complex, guidelines for laboratory practice.

   Studentbooks:

1. *Avksentyeva O.A., Petrenko V.A.* Biotechnology of higher plants: culture *in vitro*. –Kharkiv: V.N. Karazin Kharkiv National University, 2011. – 60 p.
2. *Butenko R.G.* Biology of higher plant cells *in vitro* and biotechnologies on their bases. – Moscow: FBC-Press, 1999. –160 p.
3. *Kuzmina N.A* Basic biotechnology. – [Electronic resource] – web-link: http://www.biotechnolog.ru/pcell, 2005.
4. *Lutova L.A.* Biotechnology of higher plants. – St-Petersburg: University Press, 2010. – 228 p.
5. *Molecular genetic* and biochemical methods of modern plant biology / Edited by Vl.V. Kuznetsov. – Moscow: BINOM, 2011. – 487 p.
6. *Musiyenko M.M., Panyuta O.O.* Plant Biotechnology. – Kyiv: Publisher centre «Kyiv University», 2005. – 114 p.