

DESCRIPTION OF TRAINING PROGRAMME
FOT THE DOCTORAL SCHOOL AT THE KAZIMIERZ WIELKI UNIVERSITY

INFORMATION ON COURSE	
Course	Researcher's workshop II
Type of classes	specialist classes
Academic year	2021/2022
Field of science	natural sciences
Discipline of science	biological sciences
Class instructor	dr Katarzyna Robaszkiewicz dr Małgorzata Śliwiska
Name and surname of the personal credit / examination	dr Katarzyna Robaszkiewicz
Number of hours	30
Forme of classes	lab
Pass rules	credit with grade
Language of lecture	English
Framework learning outcomes (8 PRK)	<ul style="list-style-type: none"> • knows and understands to such an extent that is possible to revise existing paradigms – world heritage, including theoretical foundations, general issues and selected specific issues – specific to a scientific or artistic discipline • knows and understands the main trends in the development of the scientific or artistic disciplines covered in the curricula • knows and understands research methodology • is able to critically analyse and evaluate the results of scientific research, expertise and other creative work and their contribution to knowledge development • is able to use knowledge from different fields of science or art to creatively identify, formulate and innovatively solve complex problems or perform research tasks, in particular: <ul style="list-style-type: none"> ○ define the purpose and subject of scientific research, formulate a research hypothesis, ○ develop research methods, techniques and tools, and use them creatively, ○ draw conclusions on the basis of scientific research • is ready for critical evaluation of the achievements of a given scientific or artistic discipline
DETAILED DESCRIPTION OF CLASSES	
Particular learning outcomes	Methods of verifications of learning outcomes
	<ul style="list-style-type: none"> • knows and understands current knowledge about the structure and functions of muscle proteins that build sarcomers; • knows and applies standard techniques used for muscle proteins preparation and purification; • knows and applies techniques of recombinant protein expression in pET system; • knows and applies methods of protein visualization by SDS-PAGE and Western Blot; • understands and performs experiments on actin depolymerization using steady state fluorescence and light scattering techniques • proposes hypotheses and suggests experiments to verify protein-protein interactions;

	<ul style="list-style-type: none"> • based on the results of experiments draws conclusions on proteins interactions and effects of mutations on the interactions; • evaluates the obtained results, compares them with literature data and critically explains reasons of possible differences and discrepancies
PROGRAM CONTENT IMPLEMENTED DURNING CLASSES	
<ol style="list-style-type: none"> 1. Preparation and purification of muscle isoform of cofilin. 2. Preparation and purification of myosin and myosin subfragment S1 3. Preparation and purification of muscle tropomodulin 4. Preparation of skeletal muscle ether powder, extration and purification of troponin. 5. Co-sedimentation assay combined with Western Blot analysis of binding of tropomodulin and cofilin to actin filament in the presence or absence of Tpm2.2 wild type and mutants. 6. Light Scattering analysis of cofilin-2 induced depolymerization of F-actin pointed end capped by tropomodulin in the presence or absence of Tpm2.2 wild type and mutants. 	
Didactic methods and eduactional techniques	Experiments on biological material with the use of scientific instruments.
Evaluation criteria	<p>Minimum required to pass – 60%</p> <p>60-67% - 3.0</p> <p>68-75% - 3.5</p> <p>76-83 % - 4.0</p> <p>84-91% - 4.5</p> <p>above 91% - 5.0</p>
The form and conditions of passing (the form of verification of learning outcomes)	<ol style="list-style-type: none"> 1. Evaluation of completeness of the laboratory logbook and the quality of descriptions of performed experiments. 2. Power point presentations of the obtained results. 3. The final grade is the arithmetic mean of the partial grades obtained from point 1 and 2.
Literature	<p>M. Green and J. Sambrook (2012) Molecular Cloning: A Laboratory Manual (Fourth Edition).</p> <p>Cold Spring Harbor Laboratory Principles and techniques in biochemistry and molecular biology, Wilson K. Walker J., ed., Oxford University Press, 2005.</p> <p>J.R. Lakowicz, Principles of Fluorescence Spectroscopy, Kluwer Academic/Plenum Publishers, New York, 1999.</p> <p>Crowley T.E., Kyte J. Experiments in the purification and characterization of enzymes. A laboratory manual. Academic Press, Elsevier, 2014. (book available in KBiBK)</p> <p>Joanna Moraczewska, Katarzyna Robaszkiewicz, Małgorzata Śliwinska, Marta Czajkowska, Thu Ly, Alla Kostyukova, Han Wen, Wenjun Zheng (2019) Congenital myopathy-related mutations in tropomyosin disrupt regulatory function through altered actin affinity and tropomodulin binding. The FEBS Journal - 2019, Vol. 286, iss. 10, pp. 1877-1893</p>