

# Department of Functional Anatomy and Cytobiology

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Topic suggestions for Master's and bachelor's these

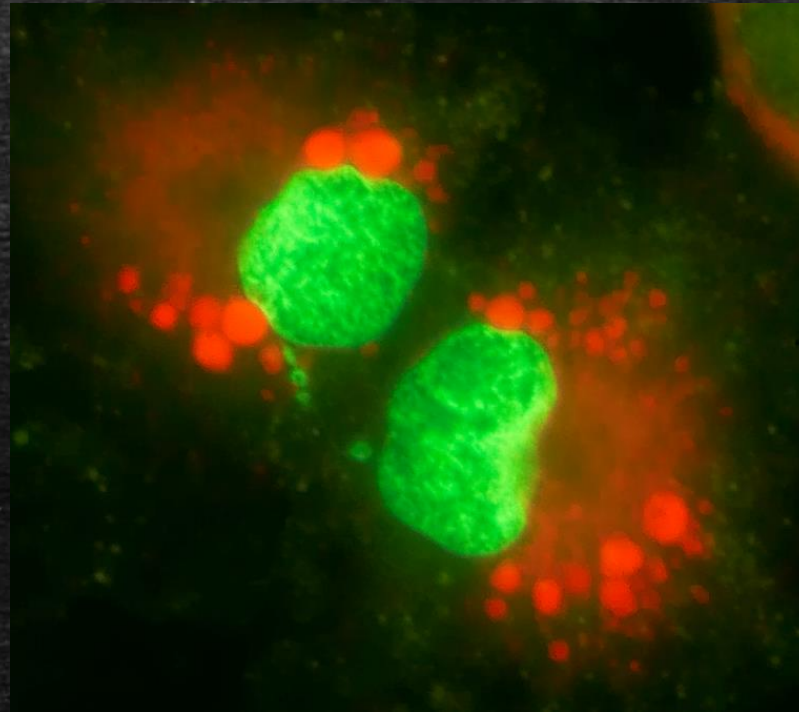
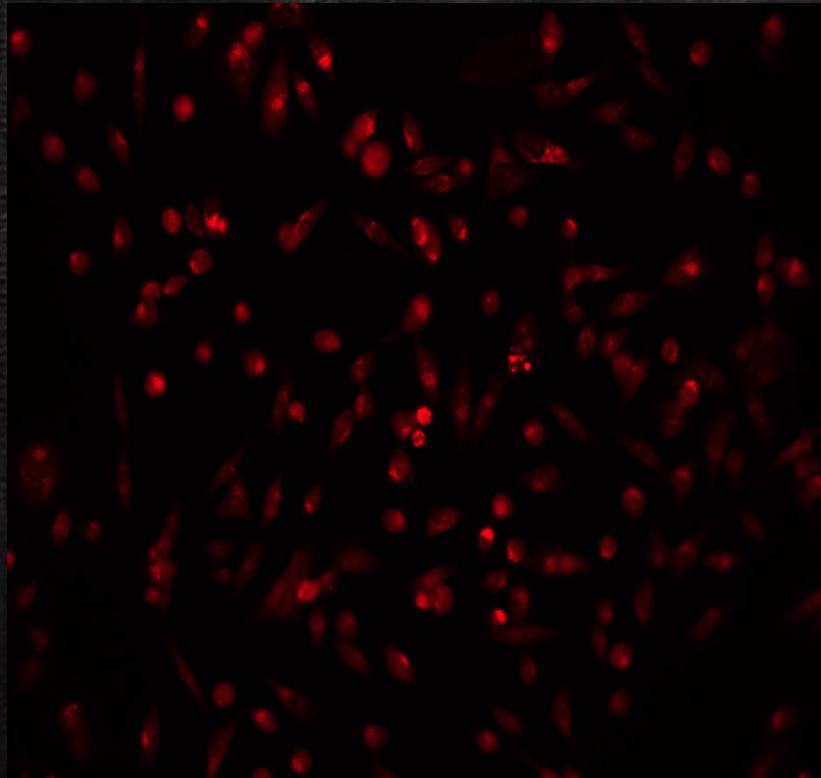
Coordinator dr Mariusz Niedźwiedź



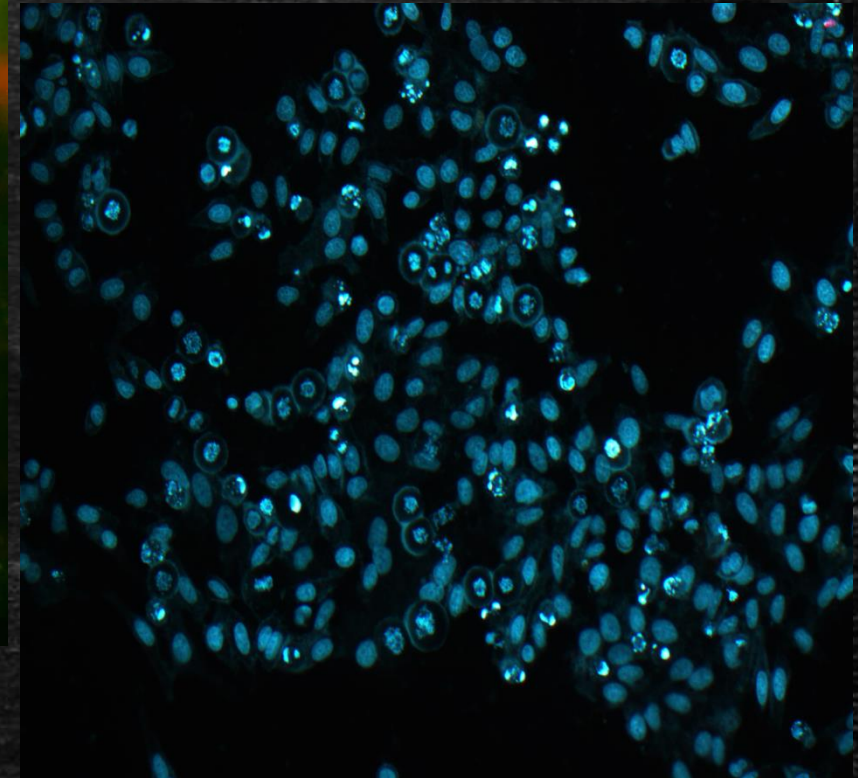
# Effect of compounds of natural origin on the induction of programmed death in cancer cells of the human central nervous system

supervisor dr hab. Joanna Jakubowicz-Gil, prof. UMCS

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acridine orange



Tumor cells stained with fluorochromes:

Hoechst 33342 and propidium iodide



# Effect of compounds of natural origin on the induction of programmed death in cancer cells of the human central nervous system

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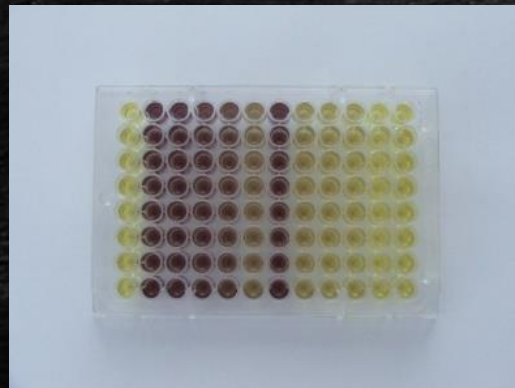
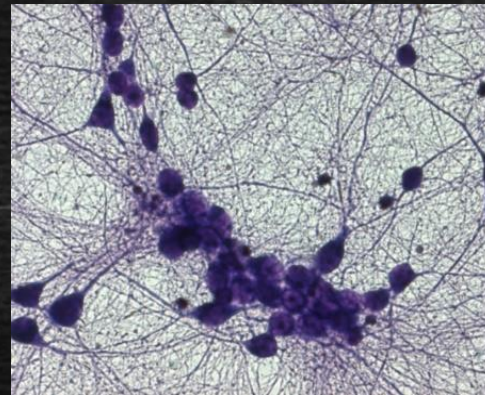
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## Using the techniques:

- Microscopic identification of apoptotic, autophagic and necrotic cells stained with specific fluorochromes,
- immunoblotting (detection of protein markers of programmed death using specific antibodies)



Chemopreventive properties of naturally derived substances. In vitro studies in a cellular model of colorectal cancer and glioma,  
supervisor Prof. dr hab. Wojciech Rzeski





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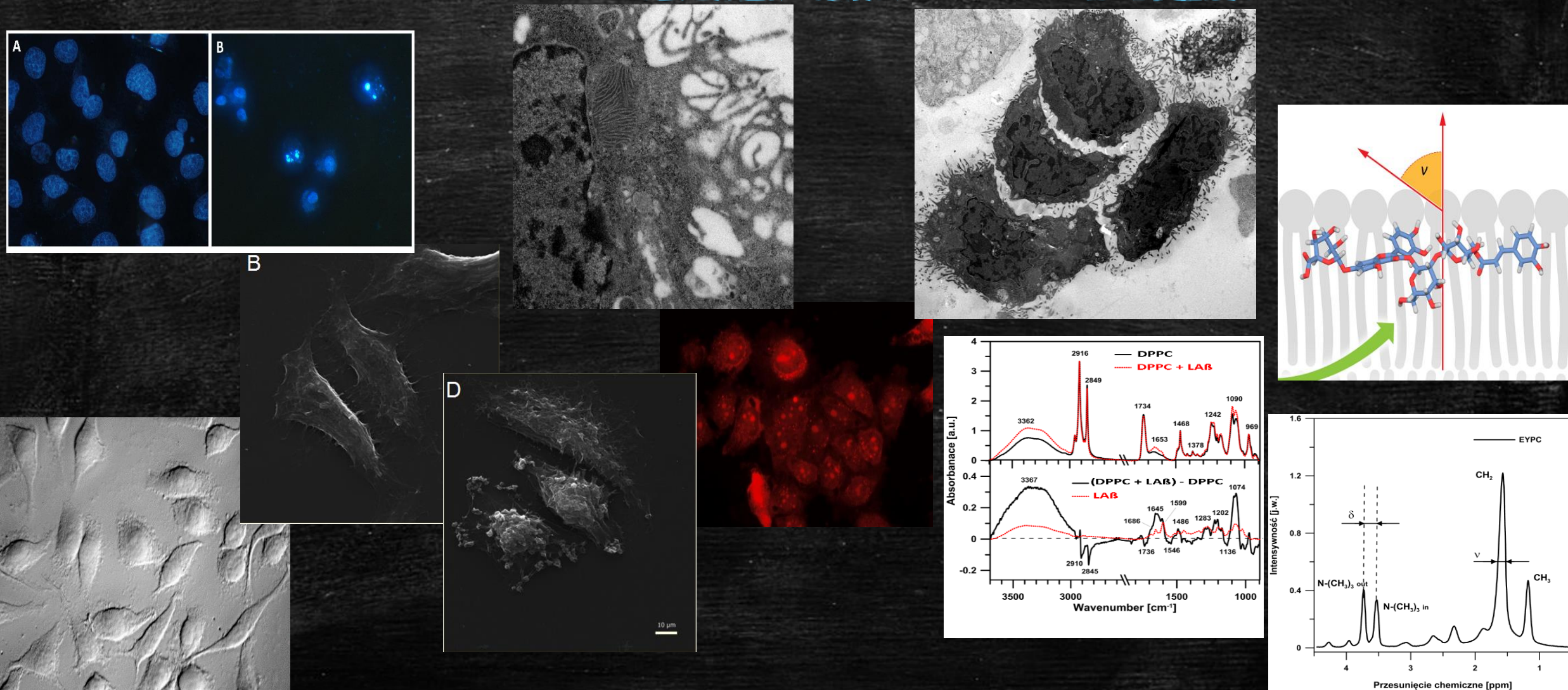
## Using the techniques:

- normal and tumor cell cultures
- microscopic, spectrophotometric and immunoenzymatic methods for determining cell viability, proliferation, death and migration



# Interactions of flavonoids and their derivatives with proteins and lipids of cancer cell membranes and their correlations with biological effects on cells,

supervisor dr hab. Bożena Pawlikowska-Pawłęga, prof. UMCS





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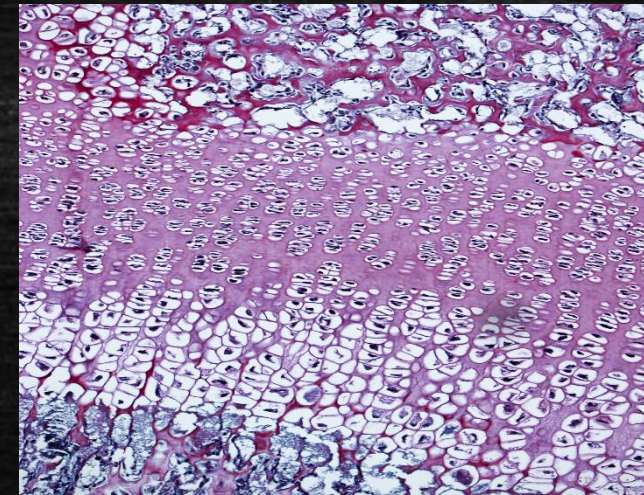
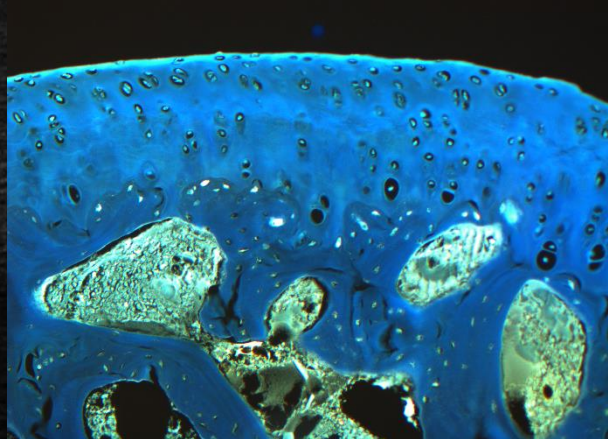
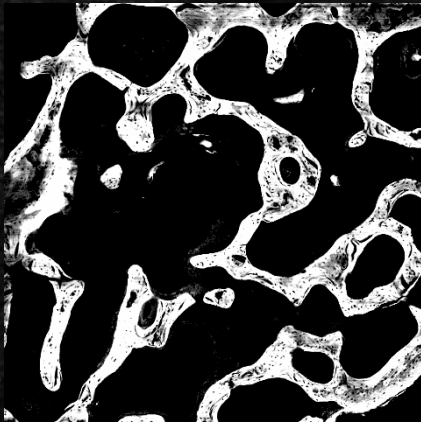
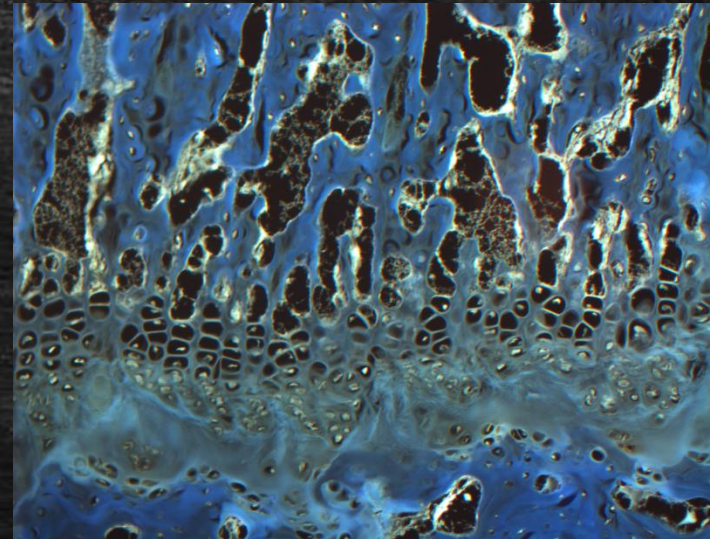
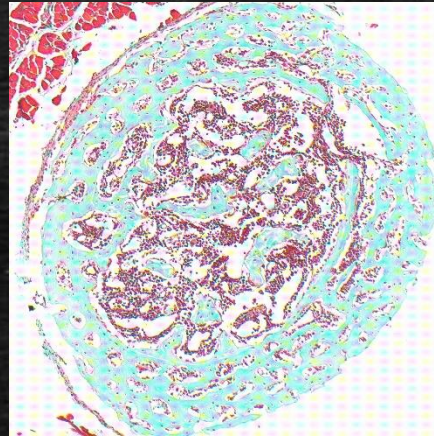
Using the techniques:

- microscopy including scanning and transmission electron microscopy, fluorescence, bright field microscopy - identification of changes in morphology and ultrastructure of the examined cells
- biophysical: NMR, FTIR, FLIM, EPR- research on the localization of compounds in membranes, their interactions with membrane proteins and lipids



# Effects of natural and synthetic compounds on the histological structure of the skeletal system,

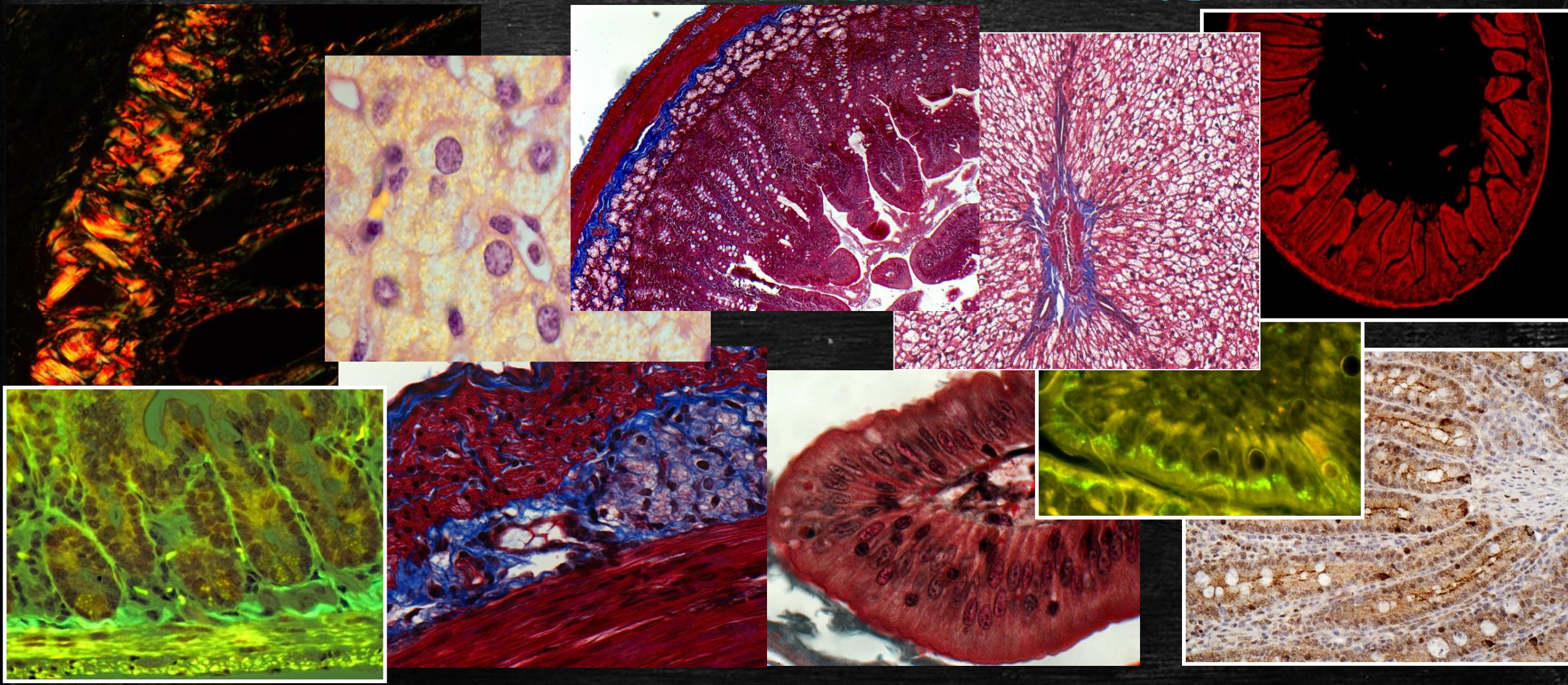
supervisor dr hab. Piotr Dobrowolski, prof. UMCS





# Effects of natural and synthetic compounds on the histological structure of the gastrointestinal tract,

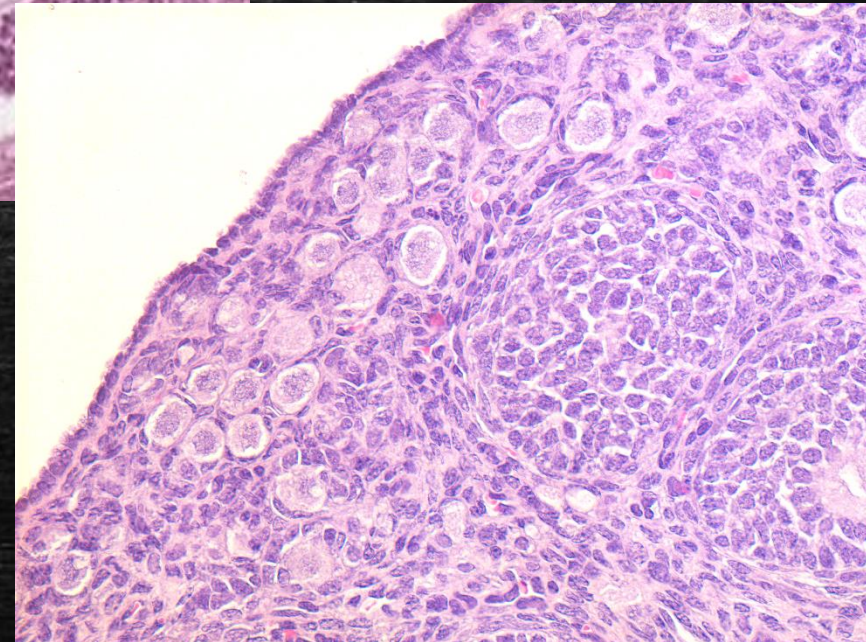
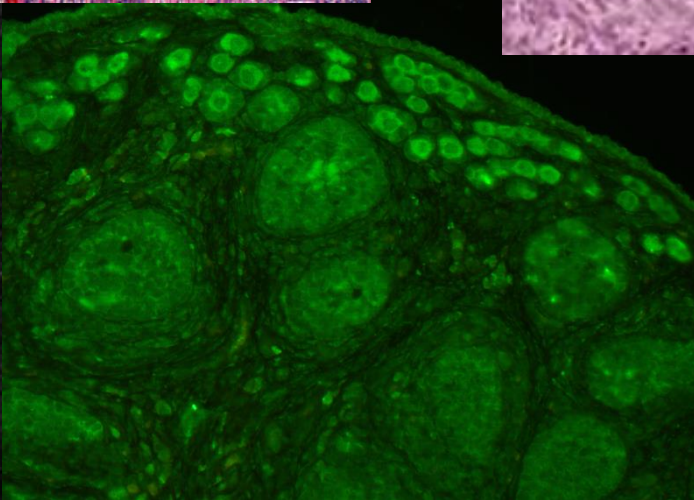
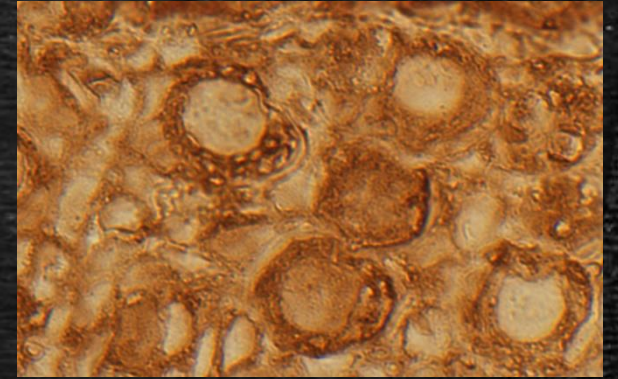
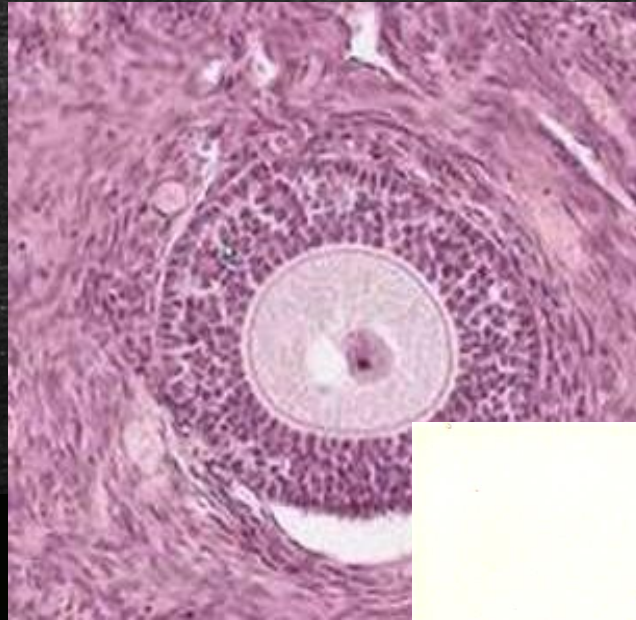
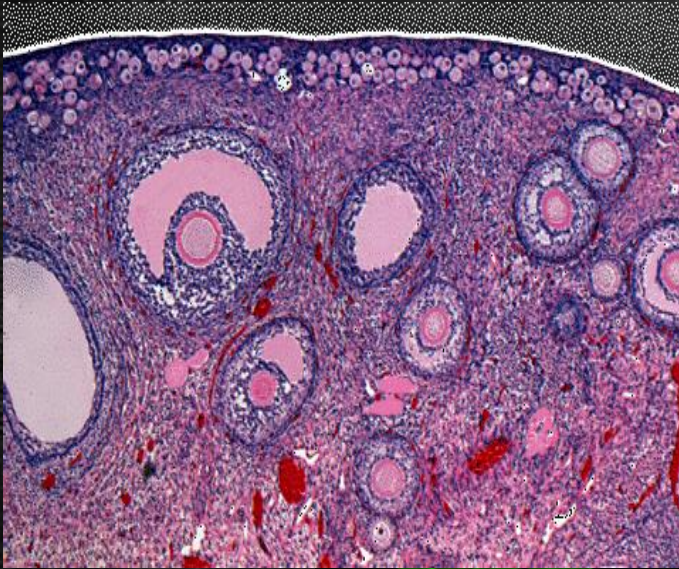
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# Effects of natural and synthetic compounds on the histological structure of the reproductive system,

supervisor dr hab. Monika Hułas-Stasiak





# Effects of natural and synthetic compounds on the histological structure of the skeletal, digestive and reproductive systems

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## ■ Using the techniques:

- **Histochemical** (stains: Hematoxylin+Eosin, Hoechst+Eosin, Safranin O, PSR - Sirius Red, Trichrome stains: Masson, Goldner, Verhoeff-Van Gieson, Mallory-Heidenhain).
- **Immunohistochemistry** on microscopic slides and Western Blot (antibodies appropriate for the proteins detection)
- **Histomorphometric analysis** (using graphical image analysis techniques: planimetry, fractal analysis, textural analysis)



# Topics of diploma theses include issues related to:

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- Human anatomy, physiology and hygiene
  - Animal histology and embryology
  - Tumorigenesis
  - Cancer Diseases
  - Cancer chemoprophylaxis
  - Health promoting properties of substances of plant origin
- Promoters of theses topics
    - Dr hab. Joanna Jakubowicz-Gil, prof. UMCS
    - Prof. dr hab. Wojciech Rzeski
    - Dr hab. Bożena Pawlikowska-Pawłęga, prof. UMCS
    - Dr hab. Piotr Dobrowolski, prof. UMCS
    - Dr hab. Monika Hułas-Stasiak
    - Dr Mariusz Niedźwiedź



# Suggested topics and sample thesis topics :

Master's theses are experimental in nature, with the research problem agreed upon with the supervisor

- Role of PI3K kinase in initiating programmed cell death of human glioma cells Dr hab. Joanna Jakubowicz-Gil, prof. UMCS
- Effects of quercetin, Temozolomide and sorafenib on the expression levels of heat shock proteins Hsp27 and Hsp72 and Ras protein in human glioblastoma multiforme cells Dr hab. Joanna Jakubowicz-Gil, prof. UMCS
- Evaluation of immunomodulatory properties of plant-derived substances in a human NK cell model Prof. dr hab. Wojciech Rzeski
- Evaluation of the antitumor activity of an aqueous extract isolated from Moringa oleifera in a cellular model of colorectal cancer Prof. dr hab. Wojciech Rzeski
- Histological structure of the digestive tract of pigs fed complete feed mixtures with a major proportion of modern rye or ungraded rye varieties Dr hab. Piotr Dobrowolski, prof. UMCS
- Histological structure of the digestive tract of pigs fed rye-based complete feed in the absence of enzymes degrading non-starch polysaccharides Dr hab. Piotr Dobrowolski, prof. UMCS
- Molecular interactions of lenzoxide A $\beta$  with lipids and proteins of human Hep-2 laryngeal carcinoma cells Dr hab. Bożena Pawlikowska-Pawłęga, prof. UMCS
- Interaction of quercetin with human cervical cancer (HeLa) cells under oxygen shock conditions Dr hab. Bożena Pawlikowska-Pawłęga, prof. UMCS
- Effects of HMB ( $\beta$ -hydroxy- $\beta$ -methylbutyric acid administered prenatally on the structure and function of the ovary of newborn piglets Dr hab. Monika Hułas-Stasiak
- Induction of autophagy in the spiny mouse lutein cells after dexamethasone treatment Dr hab. Monika Hułas-Stasiak



# Suggested topics and sample thesis topics:

Bachelor's thesis is a review, the topic of the thesis is agreed with the supervisor

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- Glioblastoma multiforme: molecular mechanisms and treatment. Cancer stem cells Dr hab. Joanna Jakubowicz-Gil, prof. UMCS
- Biology of breast cancer Prof. dr hab. Wojciech Rzeski
- Immunotherapy in the treatment of cancer Prof. dr hab. Wojciech Rzeski
- Acrylamide as an echo of civilization development - health risks and ways to protect against toxicity Dr hab. Piotr Dobrowolski, prof. UMCS
- Osteoporosis in children - causes, effects and treatment options Dr hab. Piotr Dobrowolski, prof. UMCS
- Genetic engineering methods in the treatment of human diseases Dr Mariusz Niedźwiedź
- Infertility as a worldwide problem - causes, diagnosis and treatment Dr Mariusz Niedźwiedź
- Physical activity in the treatment of cardiovascular disorders Dr Mariusz Niedźwiedź
- The thyroid gland (glandula thyroidea) and its role in the human body Dr Mariusz Niedźwiedź
- Selected methods of diagnostic imaging of cancer Dr hab. Bożena Pawlikowska-Pawlęga, prof. UMCS
- Lung cancer Dr hab. Bożena Pawlikowska-Pawlęga, prof. UMCS
- Fetal development under maternal malnutrition Dr hab. Monika Hułas-Stasiak
- Gestational diabetes - causes, management and risks Dr hab. Monika Hułas-Stasiak