Department of Cell Biology

Faculty of Biology and Biotechnology UMCS

Head of the Department, prof. dr hab. Mariusz Gagoś
(mariusz.gagos@poczta.umcs.lublin.pl)

Promotors of:

research projects

prof. dr hab. Mariusz Gagoś
dr hab. Ewa Szczuka, prof. UMCS
dr hab. Krystyna Winiarczyk, prof. UMCS
dr hab. Ewa Janik-Zabrotowicz
dr hab. Dorota Tchórzewska, prof.UMCS
dr Adrianna Sławińska-Brych
dr Marcin Domaciuk
dr Kinga Lewtak

bachelor thesis

dr hab. Ewa Szczuka, prof. UMCS
dr hab. Krystyna Winiarczyk, prof. UMCS
dr hab. Ewa Janik-Zabrotowicz
dr hab. Dorota Tchórzewska, prof.UMCS
dr Joanna Strubińska
dr Adrianna Sławińska-Brych
dr Marcin Domaciuk
dr Kinga Lewtak

Research topics

- **In vitro anticancer and antifungal activity of natural and synthetic compounds**
  - *prof. dr hab. Mariusz Gagoś*
  - *dr Adrianna Sławińska-Brych*

- **Application of infrared microspectroscopy for chemical mapping at cellular and tissue levels**
  - *prof. dr hab. Mariusz Gagoś*

- **Spectroscopic and structural studies of the molecular organization of bioactive compounds in model biological systems**
  - *prof. dr hab. Mariusz Gagoś*
  - *dr hab. Ewa Janik-Zabrotowicz*

- **Different molecular forms of plant pigments and their use in medicine**
  (skin photoprotection, photodynamic therapy)
  - *dr hab. Ewa Janik-Zabrotowicz*

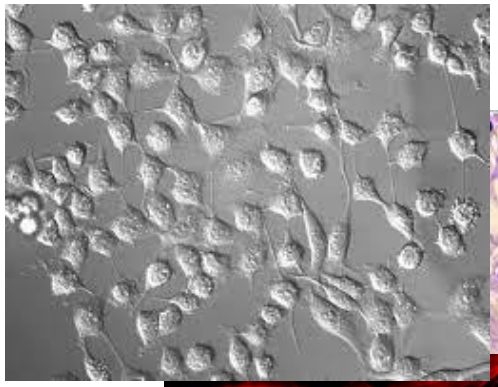
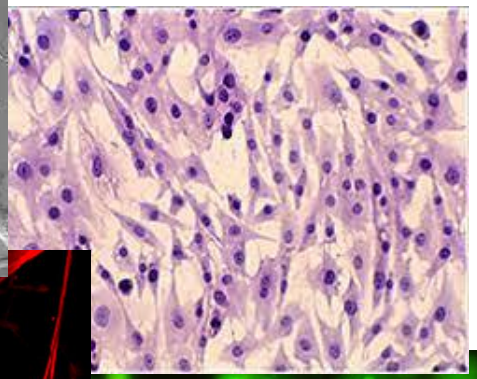
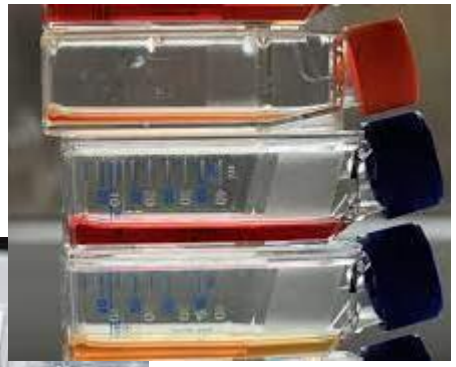
Research topics

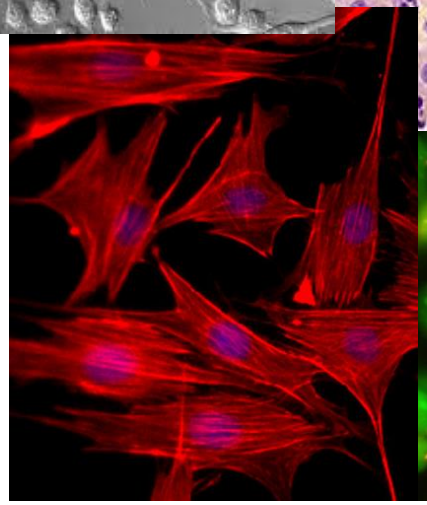
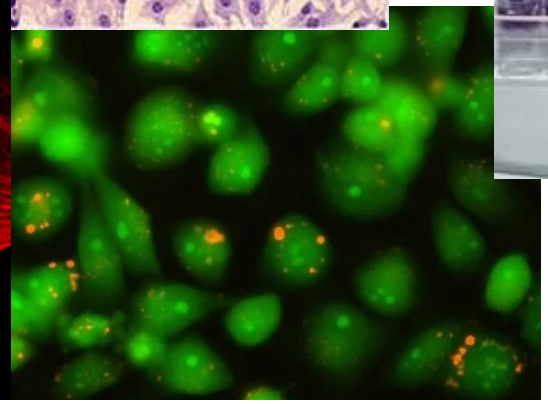
- **Plant *in vitro* cultures: regeneration processes in higher plants**
- **Biological and biotechnological potential of plants and its applications**
- **Breaking of deep seed dormancy and disruptions of sexual reproduction of wild and commercially important plants**
- **Phenology, morphology, histology, anatomy, histogenesis, organogenesis and plant embryology, with particular reference to agriculturally and evolutionarily important species**

- prof. dr hab. Mariusz Gagoś
- dr hab. Ewa Szczuka, prof. UMCS
- dr hab. Krystyna Winiarczyk, prof. UMCS
- dr hab. Dorota Tchórzewska, prof.UMCS
- dr Marcin Domaciuk
- dr Kinga Lewtak

RESEARCH TECHNIQUES

ANIMAL IN VITRO CULTURES

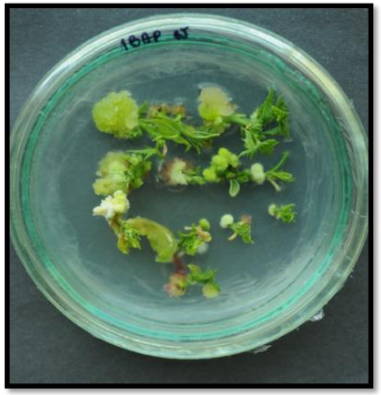

Study on the in vitro anticancer activity of natural and synthetic compounds

People involved in the topic:

dr Adrianna Sławińska-Brych

RESEARCH TECHNIQUES

PLANT IN VITRO CULTURE



Regeneration processes in higher plants

People involved in the topic:

dr Kinga Lewtak

dr hab. Krystyna Winiarczyk, prof. UMCS

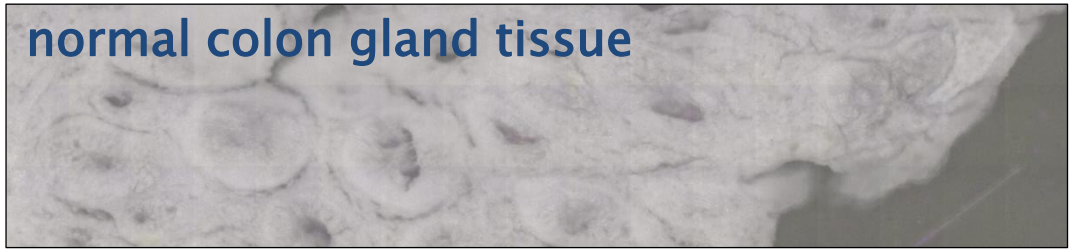
dr hab. Dorota Tchórzewska, prof. UMCS

dr Marcin Domaciuk

RESEARCH TECHNIQUES

INFRARED MICROSPECTROSCOPY

IR MIKROSCOPE



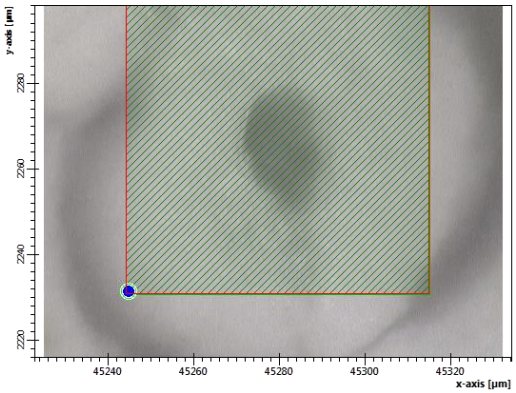
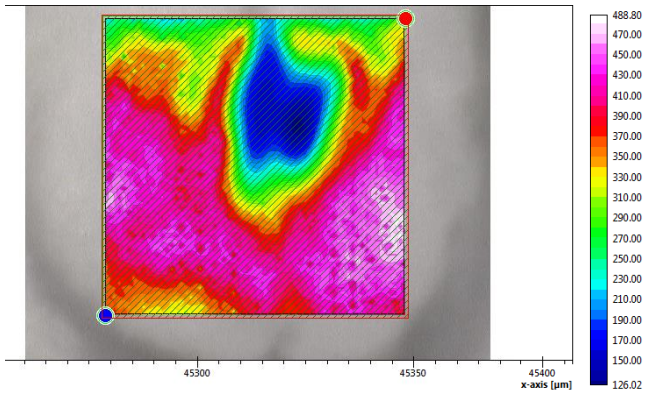


image in visible light



infrared image

People involved in the topic:

prof. dr hab. Mariusz Gagoś

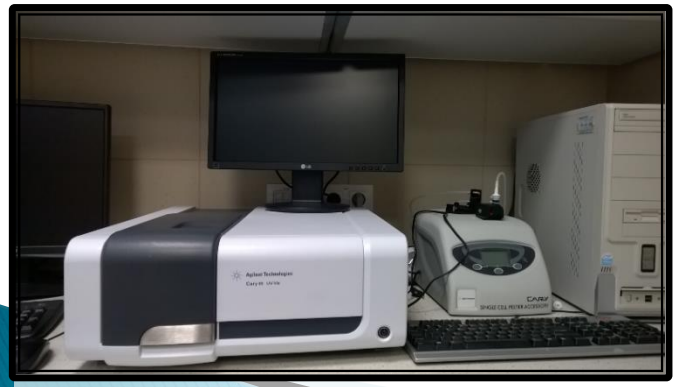
dr hab. Ewa Janik

RESEARCH TECHNIQUES

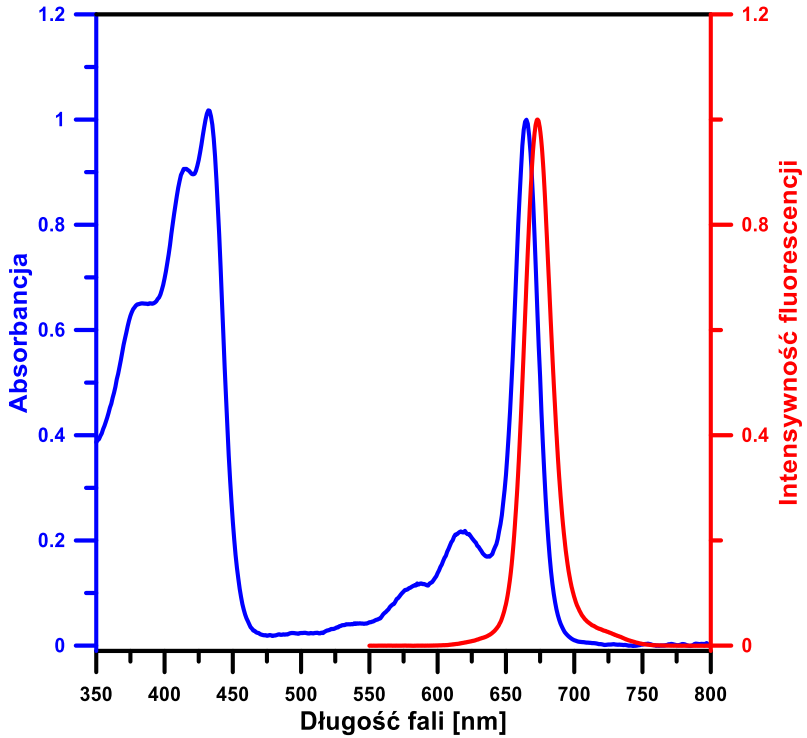
UV–VIS ABSORPTION AND FLUORESCENCE SPECTROSCOPY

ELISA METHOD

FLUORESCENCE SPECTROPHOTOMETER



UV–VIS ABSORPTION SPECTROPHOTOMETER



People involved in the topic:

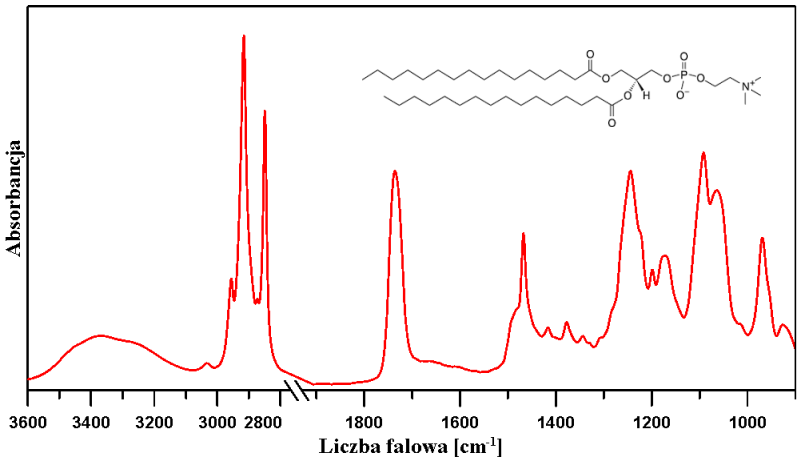
prof. dr hab. Mariusz Gagoś

dr hab. Ewa Janik

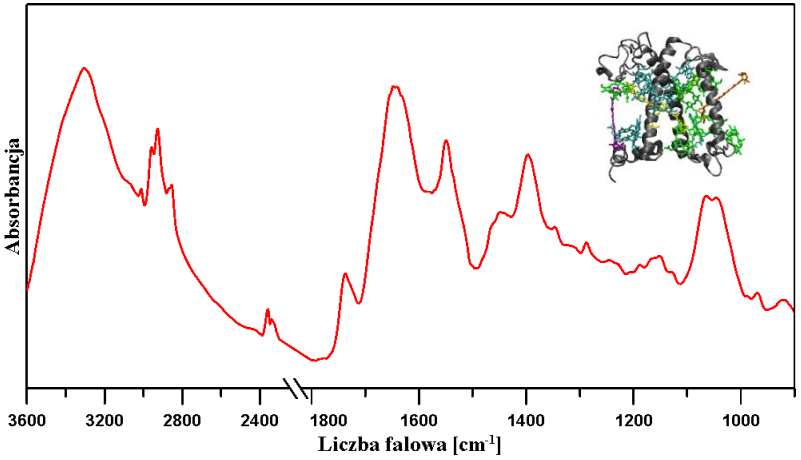
RESEARCH TECHNIQUES

FOURIER TRANSFORM INFRARED ABSORPTION SPECTROSCOPY (FTIR)

lipid DPPC



photosynthetic complex LHCII



FTIR – ABSORPTION SPECTROPHOTOMETER

People involved in the topic:

prof. dr hab. Mariusz Gagoś

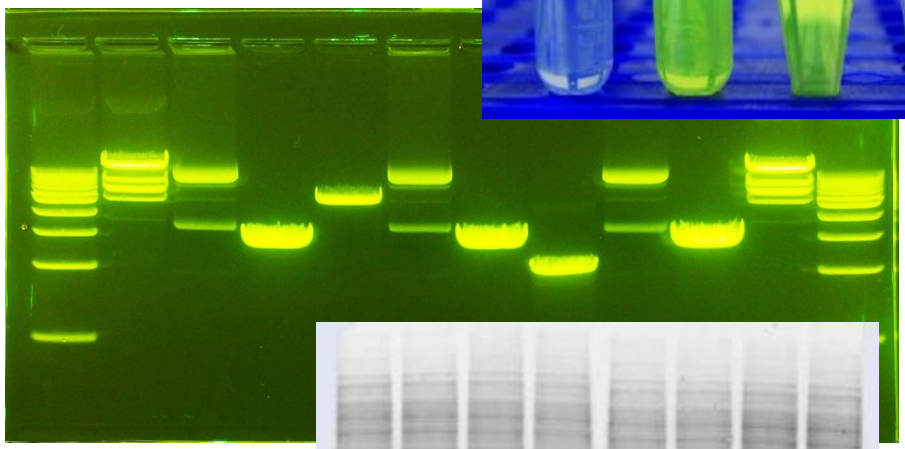
dr hab. Ewa Janik

RESEARCH TECHNIQUES

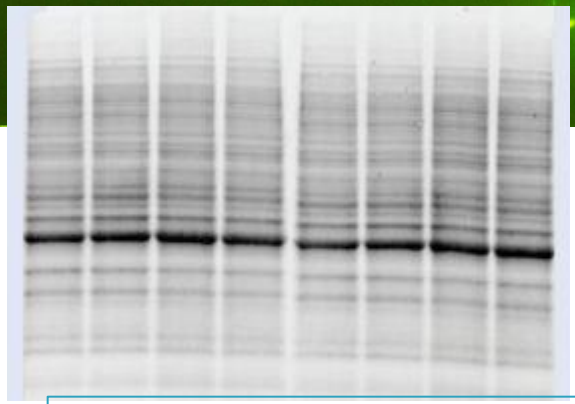
BIOCHEMICAL ANALYSES :

- analysis of the chemical composition and enzymes activity

- electrophoresis



- blotting techniques



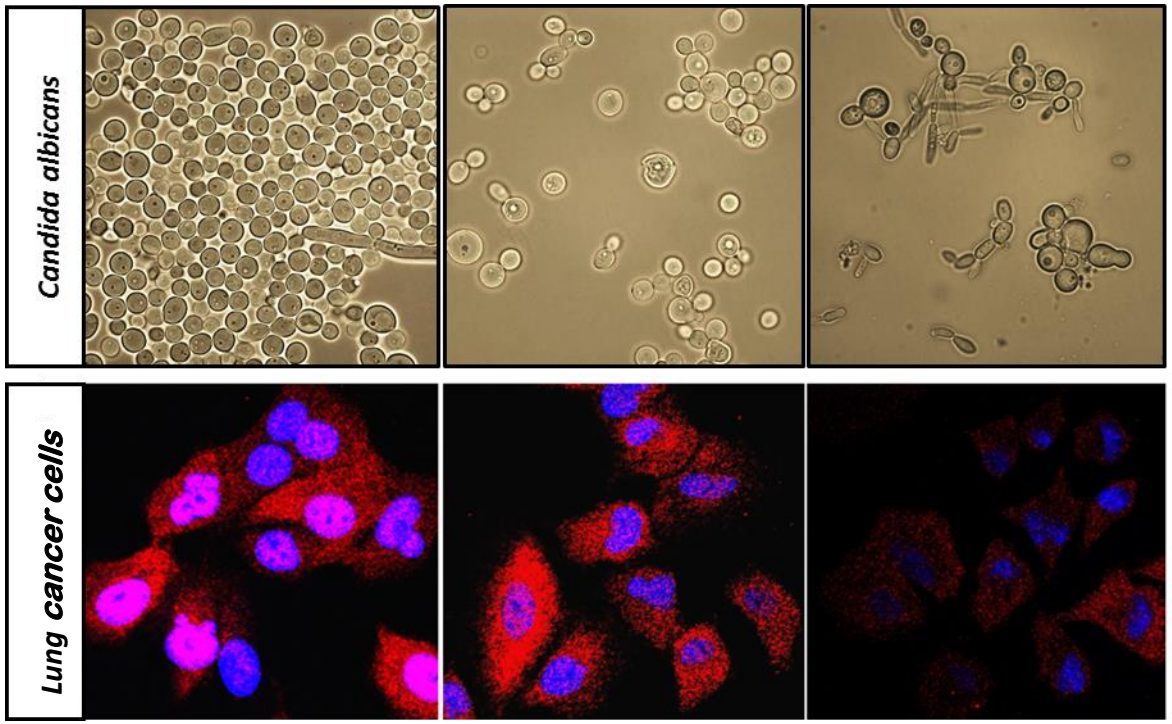
People involved in the topic:

dr Adrianna Sławińska-Brych

RESEARCH TECHNIQUES

LIGHT, FLUORESCENCE MIRROSCOPY AND FLOW CYTOMETRY

LIGHT/FLUORESCENCE MICROSCOPE



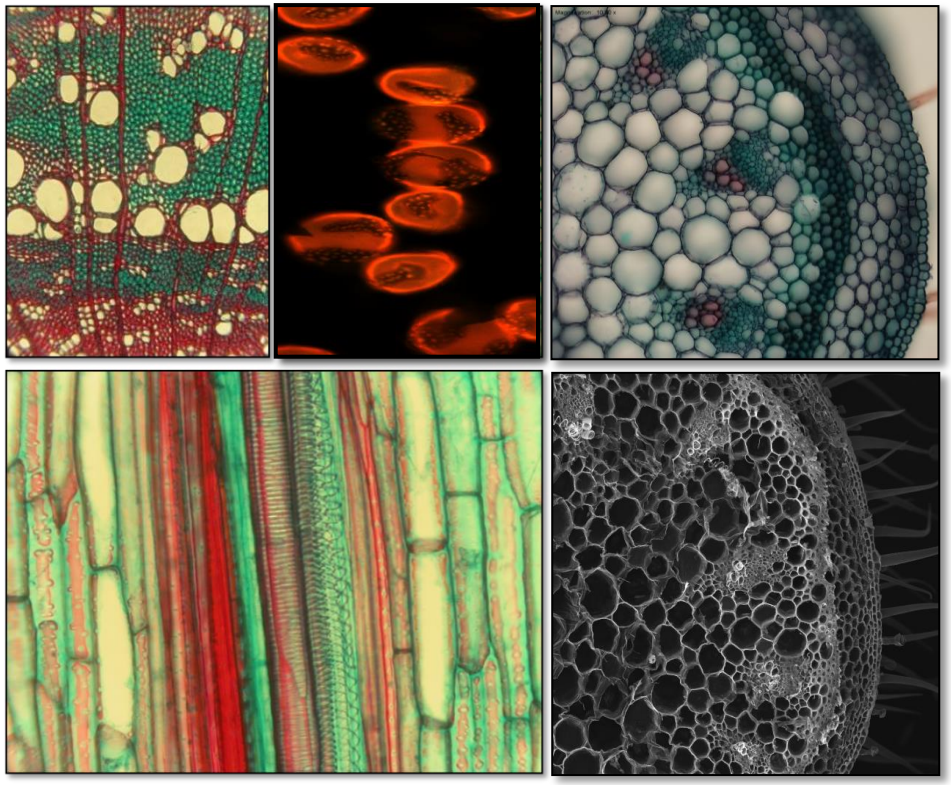
People involved in the topic:

prof. dr hab. Mariusz Gagoś

dr Adrianna Sławińska-Brych

RESEARCH TECHNIQUES

LIGHT MICROSCOPY
dark field, fluorescence, polarization, Nomarski contrast



Anatomical studies with various microscopic techniques

People involved in the topic:

dr hab. Ewa Sczuka, prof. UMCS

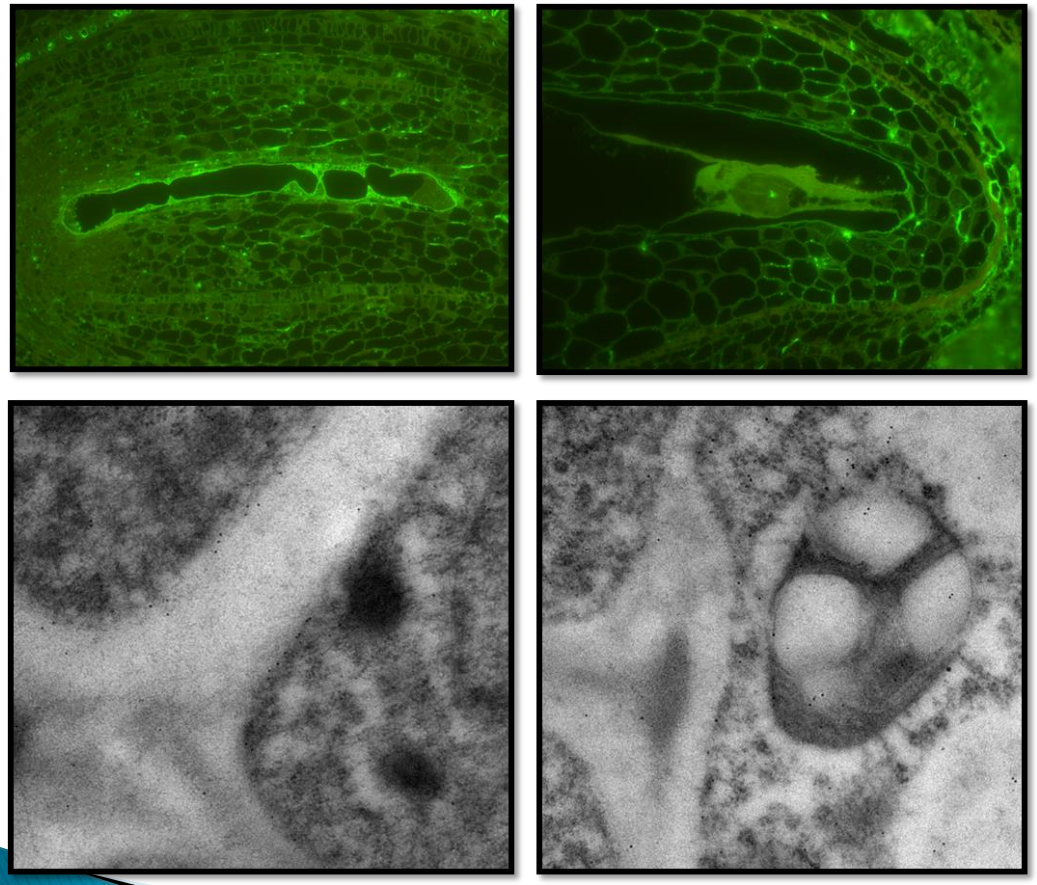
dr hab. Krystyna Winiarczyk, prof. UMCS

dr hab. Dorota Tchórzewska, prof. UMCS

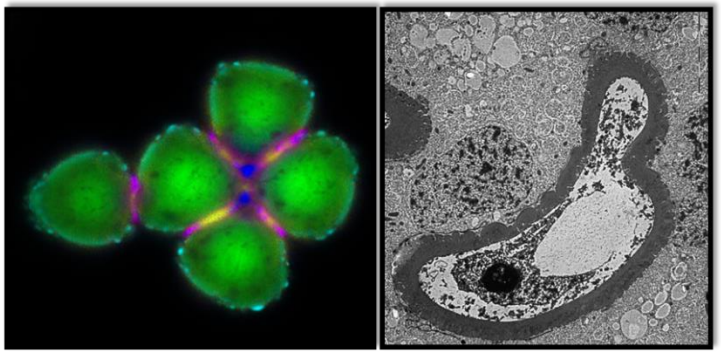
dr Marcin Domaciuk

RESEARCH TECHNIQUES

FLUORESCENCE AND ELECTRON MICROSCOPY



Immunolocalisation of proteins in the ovary sac



Microsporogenesis in flowering plants

People involved in the topic:

Dr hab. Ewa Szczuka, prof. UMCS

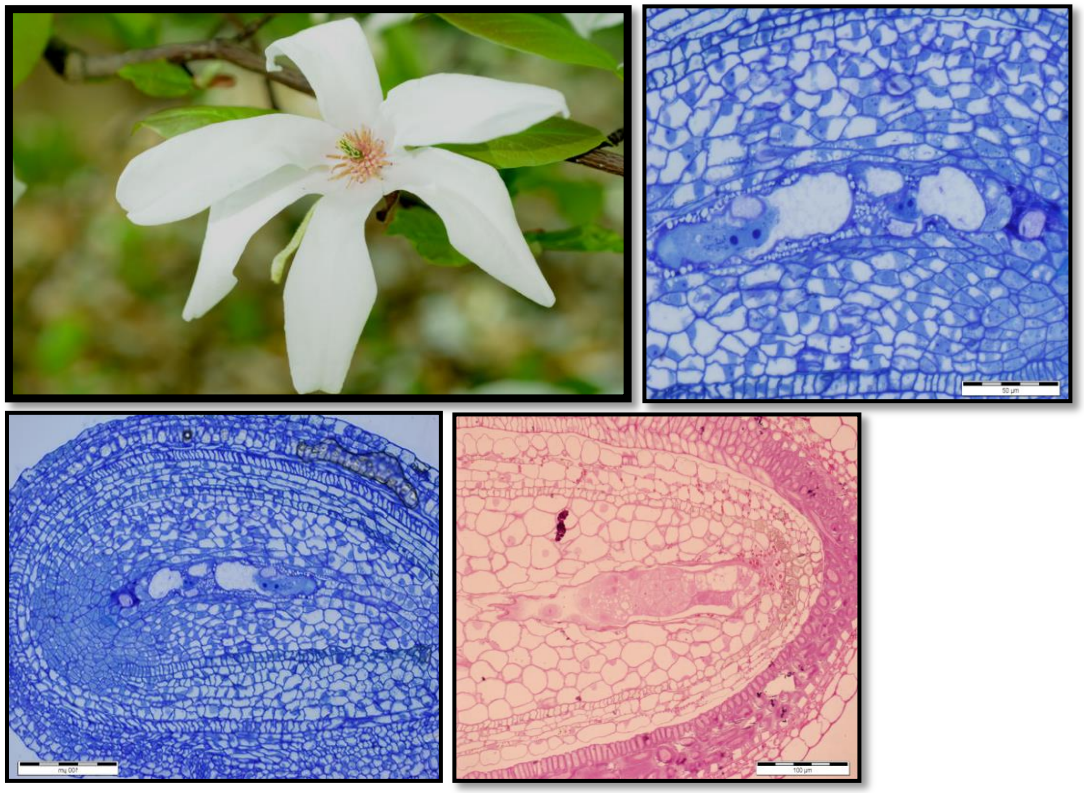
Dr hab. Krystyna Winiarczyk, prof. UMCS

Dr hab. Dorota Tchórzewska, prof. UMCS

Dr Marcin Domaciuk

RESEARCH TECHNIQUES

LIGHT MICROSCOPY



Megasporogenesis in flowering plants

People involved in the topic:

dr hab. Ewa Szczuka, prof. UMCS

dr hab. Krystyna Winiarczyk, prof. UMCS

dr hab. Dorota Tchórzewska, prof. UMCS

dr Marcin Domaciuk

Example of Bachelor Thesis Topics

ZAKŁAD BIOLOGII KOMÓRKI
WYDZIAŁ BIOLOGII I BIOTECHNOLOGII UMCS

More topics can be found at: https://apd.umcs.pl/catalogue/ after typing in the name of the promotor

- **Biologically active molecules of plants used in medicine.** dr hab. Ewa Janik-Zabrotowicz
- **Blue light. Is it safe for the eyes?** dr hab. Ewa Janik-Zabrotowicz
- **Programmed plant cell death.** dr hab. Krystyna Winiarczyk
- **Significance of generative propagation of flowering plants for plant breeding and development of new varieties.**

  dr hab. Krystyna Winiarczyk
- **Parasite plants occurring in Poland.** dr hab. Dorota Tchórzewska
- **Heteromorphism of stamens within dimorphic flowers.** dr hab. Dorota Tchórzewska
- **Plant fibres and their use.** dr hab. Ewa Szczuka
- **Stem structure of fibre plants.** dr hab. Ewa Szczuka
- **Cancer stem cells versus resistance to anti-cancer therapy.** dr Adrianna Sławińska-Brych
- **The influence of diet on the development of colon cancer.** dr Adrianna Sławińska-Brych
- **The role of adhesion proteins in the process of carcinogenesis.** dr Joanna Strubińska
- **Hsp70 proteins as cell defenders and therapeutic target.** dr Joanna Strubińska
- **Effects of phytotherapy on the treatment of human obesity.** dr Marcin Domaciuk
- **Use of plants in the cosmetics industry..** dr Marcin Domaciuk

UMCS

ZAKŁAD BIOLOGII KOMÓRKI
WYDZIAŁ BIOLOGII I BIOTECHNOLOGII UMCS

Example topics for master theses/reserch projects

More topics can be found at: https://apd.umcs.pl/catalogue/ after typing in the name of the promotor

- Application of infrared absorption spectroscopy to assess the neuroprotective potential of xanthohumol. prof. dr hab. Mariusz Gagoś
- Antifungal activity of 2-methylamino-5- (2,4-dihydroxyphenyl) -1,3,4-thiadiazole (MDFT) in interaction with amphotericin B (AmB) from strains of Candida albicans and Candida parapsilosis). prof. dr hab. Mariusz Gagoś
- Photostability of chlorophyll a monomer encapsulated into drug carier – Cremophor EL nanomicelles. dr hab. Ewa Janik-Zabrotowicz
- Interaction of 4-([1,2,4]triazolo[4,3-a]pyridine-3-yl)-6-methylbenzene-1,3-diol (TPBD) with lipid bilayer in the light of molecular spectroscopy. dr hab. Ewa Janik-Zabrotowicz
- Evaluation of the regenerative capacity of different leaf fragments of Kalanchoe daigremontiana to form somatic embryos. dr hab. Krystyna Winiarczyk
- Reproductive potential of invasive plants on the example of Bunias orientalis L. dr hab. Krystyna Winiarczyk
- Comparison of sclerenchymatous fibres in the stem of the energetic plant Sida hermaphrodita (L.) Rusby with other plants' fibres. dr hab. Ewa Szczuka
- Cuticle on plant organs. dr hab. Ewa Szczuka
- Selected plant secondary metabolites - function and biotechnological application. dr hab. Dorota Tchórzewska
- Evaluation of germination, growth and development of selected agricultural plants growing under greenhouse conditions using innovative lighting systems. dr hab. Dorota Tchórzewska
- Antineoplastic activity of xanthohumol in multiple myeloma cultures. dr Adrianna Sławińska-Brych