

LABORATORY OF ADAPTATIONAL BIOTECHNOLOGY

Institute of Cell Biology and Genetic Engineering
of the National Academy of Sciences of Ukraine



Our research areas:

- genetic transformation of plants of various species;
- study of the bioactivity of medicinal plants;
- use of hairy roots of medicinal plants as biofactories for the synthesis of valuable compounds with a wide range of activities (antioxidant, antiradical, anti-inflammatory, antiviral, antimicrobial);
- development of an effective technology for the "green" synthesis of metal nanoparticles;
- development of approaches for the use of plants of various species in the phytoremediation process;
- use of the in vitro collection of bryophytes for a wide range of research.



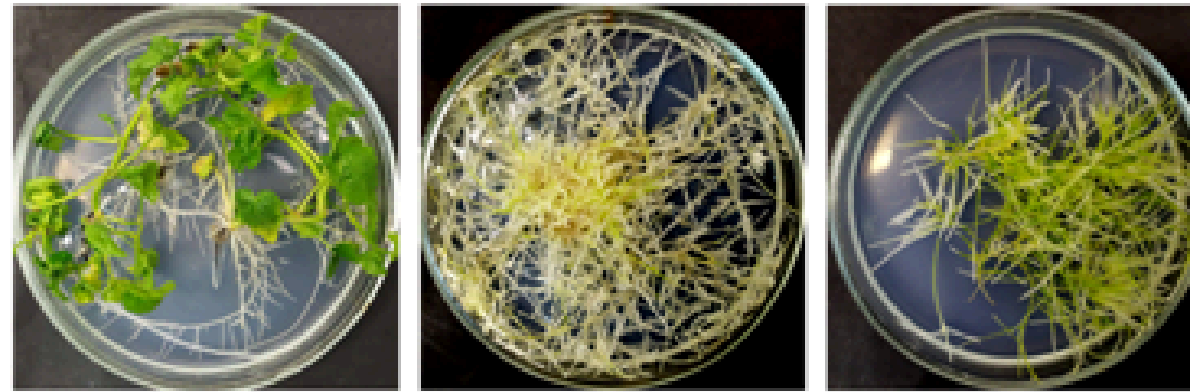
A unique collection of hairy roots

IN 2011, THE LABORATORY OF ADAPTIONAL BIOTECHNOLOGY BEGAN CREATING A COLLECTION OF HAIRY ROOTS OF MEDICINAL PLANTS.

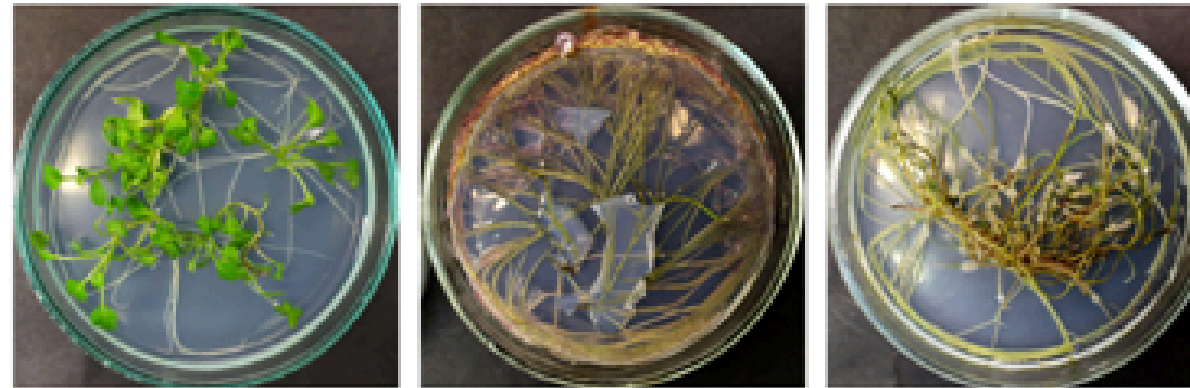
CURRENTLY, THE COLLECTION INCLUDES ABOUT 80 COLLECTION HAIRY ROOT SAMPLES OF ARTEMISIA ANNUA, A. TILESII, A. VULGARIS, A. DRACUNCULUS, A. LUDOVICIANA, A. BALCHANORUM, CICHORIUM INTYBUS, ALTHAEA OFFICINALIS, BIDENS PILOSA, PYRETHRUM CORYMBOSUM, CALENDULA OFFICINALIS, AND LINARIA MAROCCANA PLANTS.



*Althaea
officinalis*



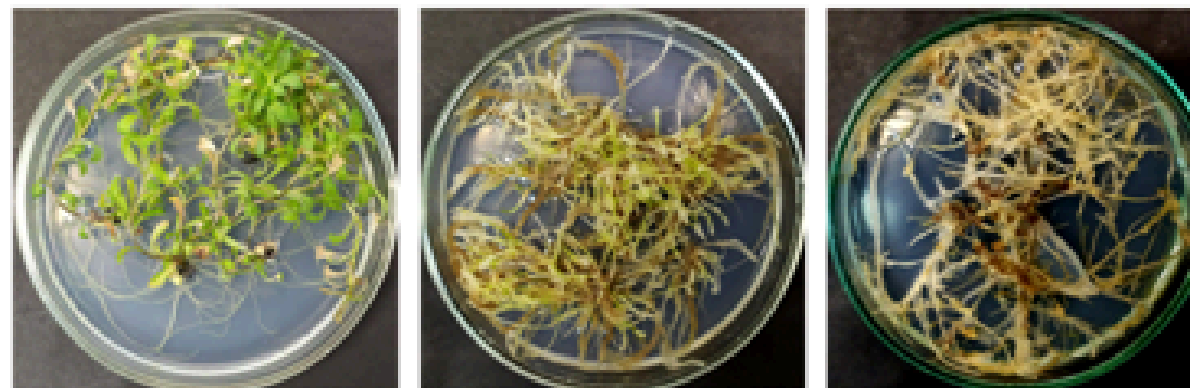
*Artemisia
vulgaris*



*Artemisia
dracunculus*



*Artemisia
ludoviciana*



*Artemisia
tilesii*



Some publications:

Bohdanovych T., et al. (2025) Comparison of silver and gold nanoparticles "green" synthesis by *Artemisia annua* hairy root extracts – *Biol Open* 14 (3): bio061739.

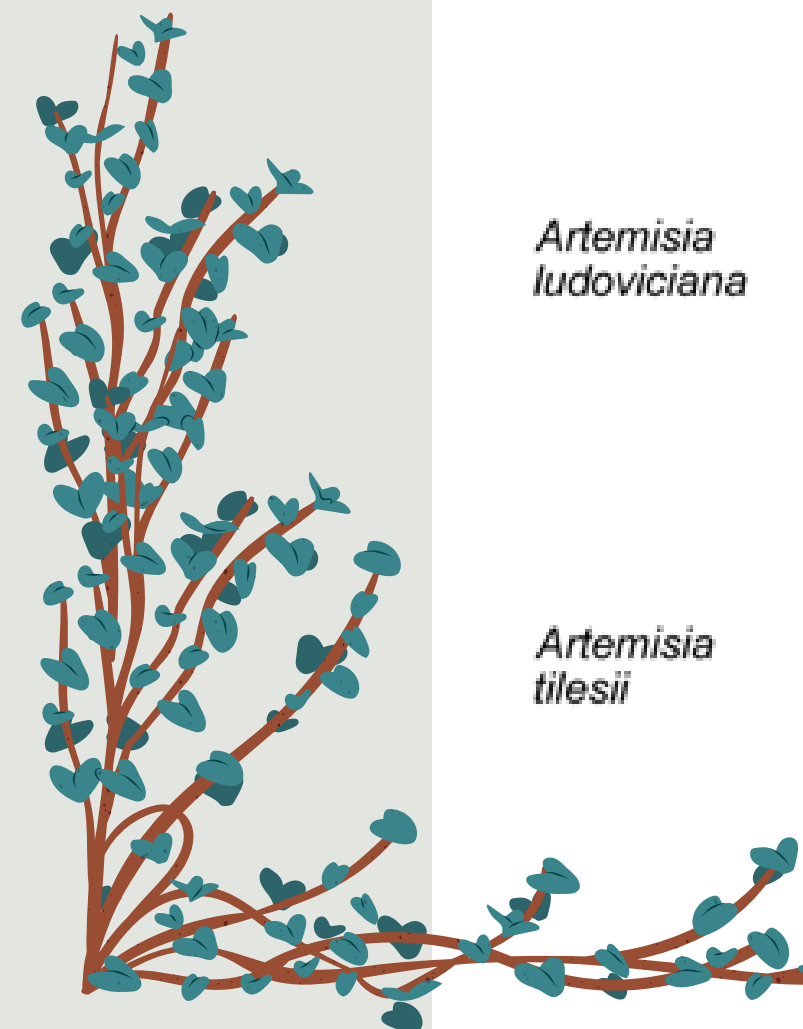
<https://doi.org/10.1242/bio.061739>

Matvieieva et al. (2022). Study of superoxide dismutase activity in long-term cultivated *Artemisia* and *Althaea* "hairy" roots. *Current Microbiology*, 79(1), 14.

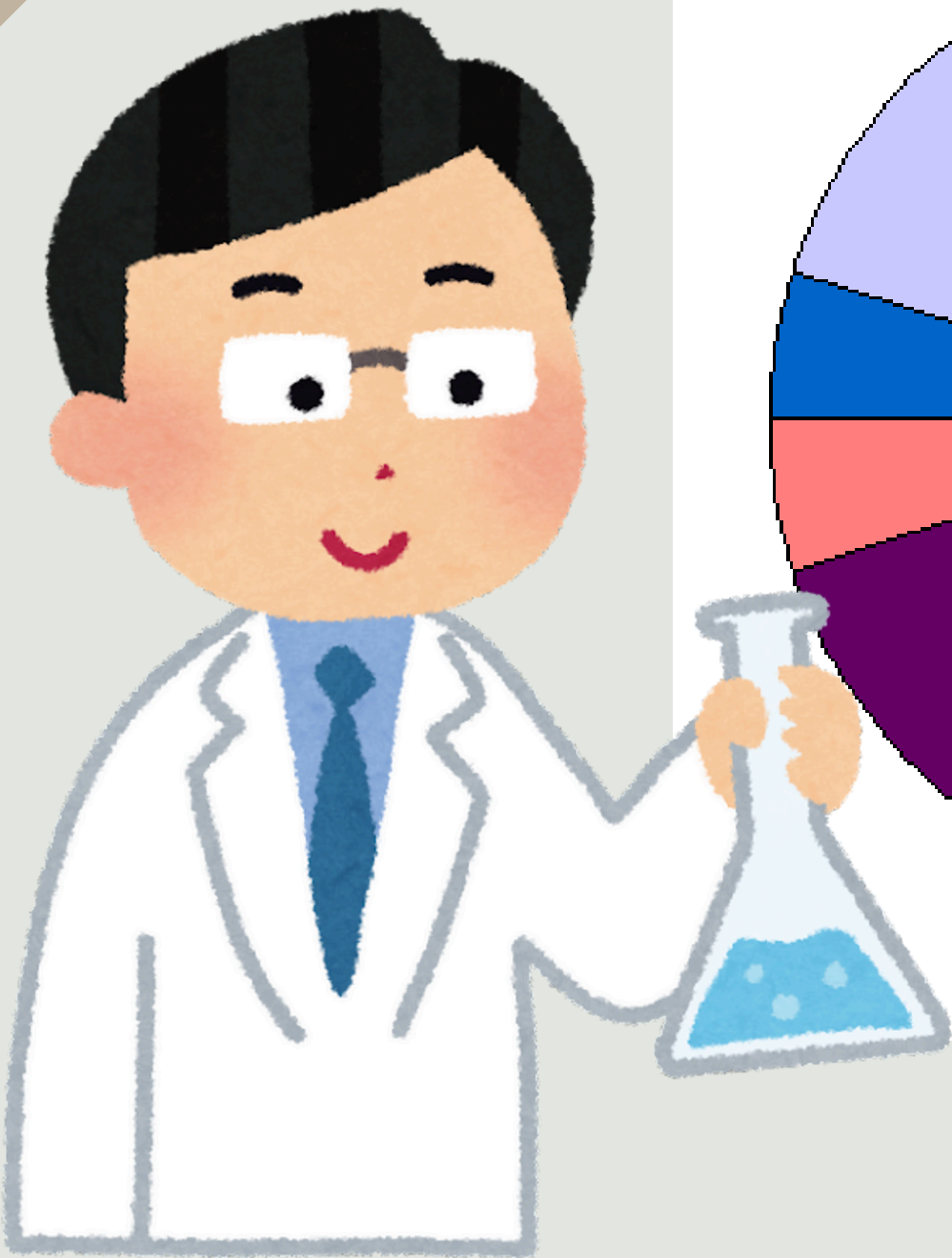
<https://doi.org/10.1007/S00284-021-02709-0>

Matvieieva, et al. (2020). *Agrobacterium rhizogenes*-mediated transformation enhances the antioxidant potential of *Artemisia tilesii* Ledeb. *Plant Physiol. Biochem.*, v. 152, pp. 177-183.

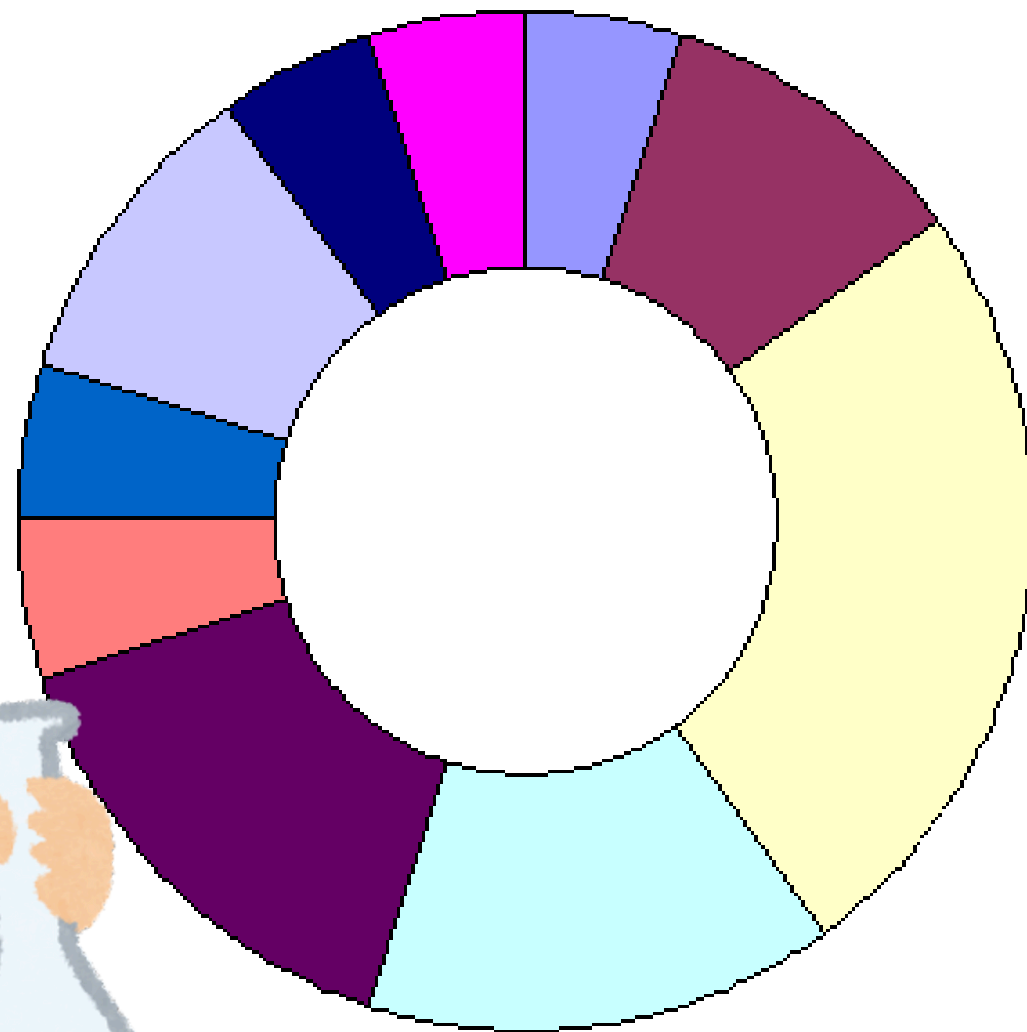
<https://doi.org/10.1016/j.plaphy.2020.04.020>



The collection of hairy roots



Research areas



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
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Human ifn synthesis

Optimization of extraction procedure

Increasing of flavonoid content

Increasing of antioxidant activity

Metal nanoparticles "green" synthesis

Study of antiviral activity

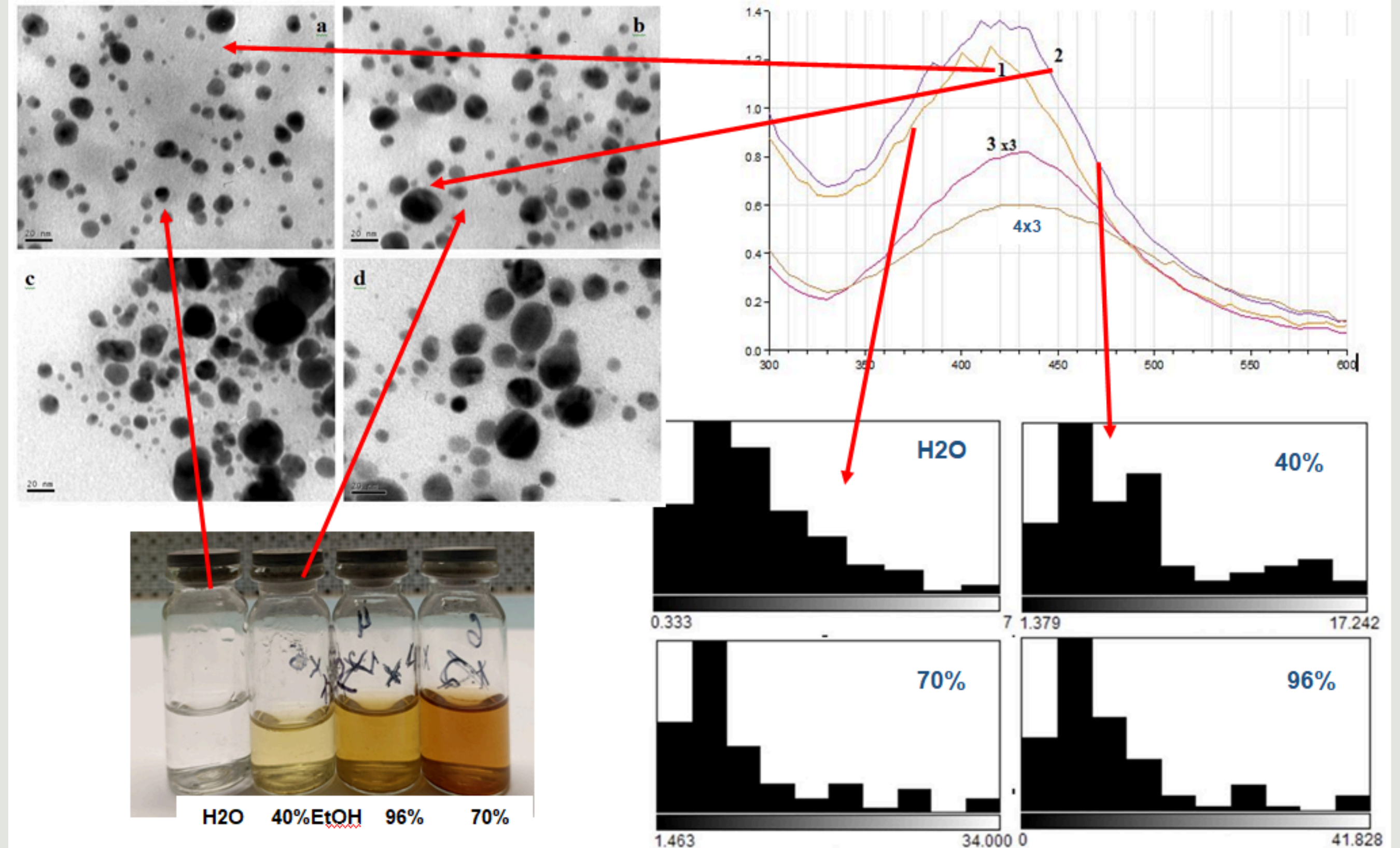
Study of anti-inflammatory activity

Study in phytoremediation

Study of genes activity

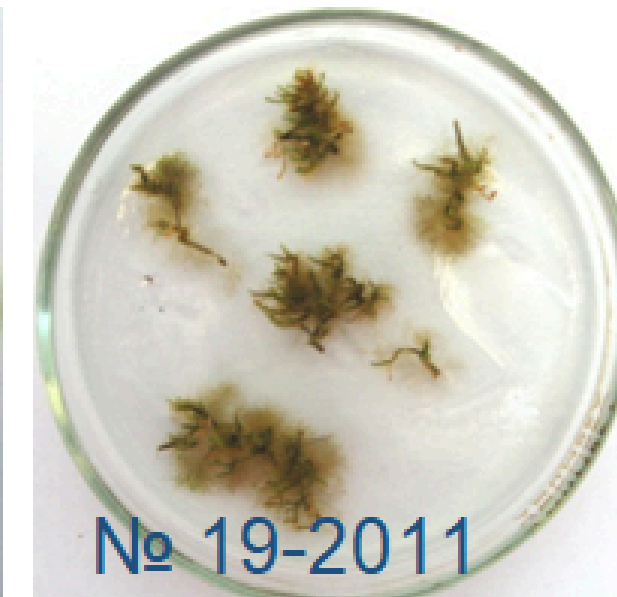
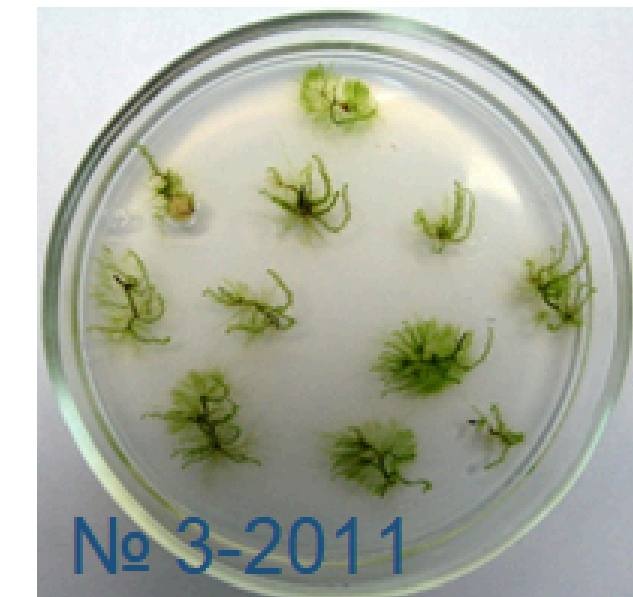
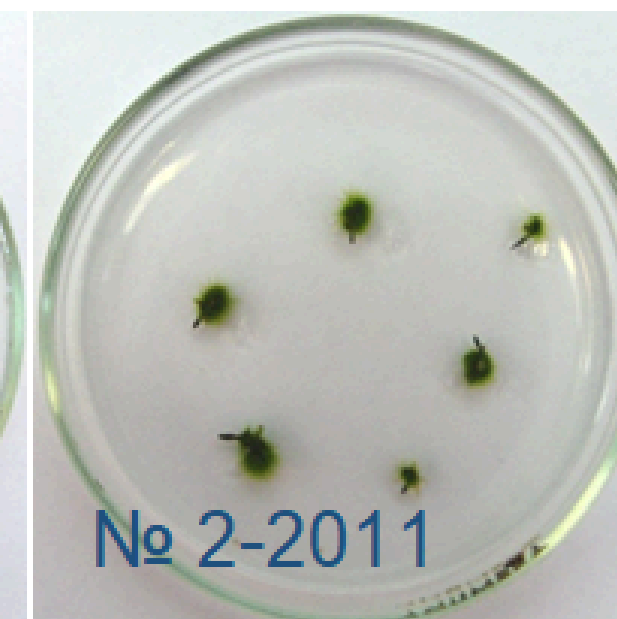
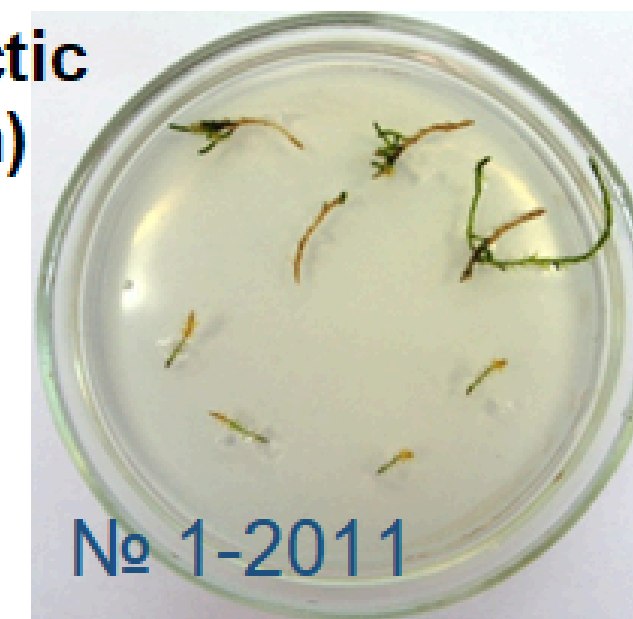
Other

Using of hairy root extracts for metal nanoparticles “green” synthesis



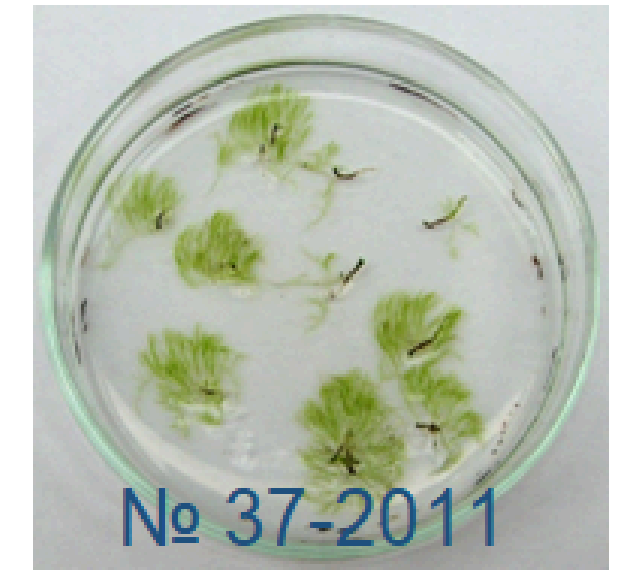
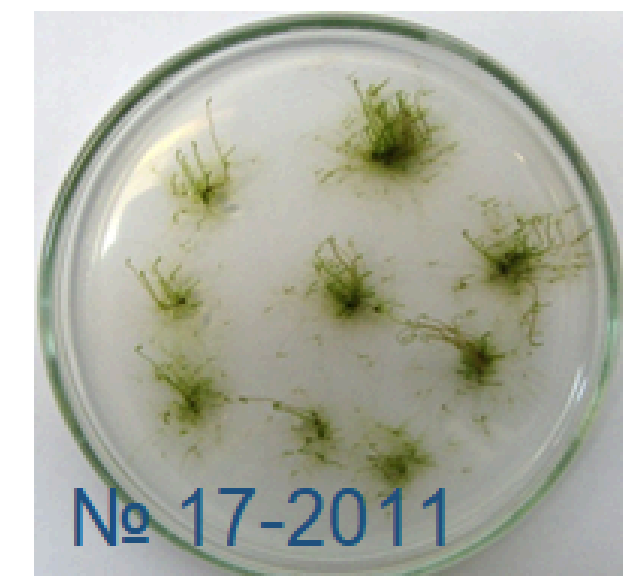
In vitro collection of mosses

The native samples were collected in West Antarctic region (Galindez isl., Akademik Vernadsky station)



Research areas

- Adaptation to stress factors
- Peculiarities of in vitro growth
- DNA barcoding



Our contacts

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