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# Kostrouch Lab

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**"We study structure and function of cells in their normal state and in pathology – integrative biology and pathology."**

## Offer

- Detection and Research of hormonally active substances in the diet and in the environment
- Preparation of artificial proteins with special properties
- *C. elegans* – genetics, genomics, genome editing

## Expertise

- Evolutionarily preserved mechanisms of regulation of gene expression
- Development of systems for the production of artificial proteins
- Bioinformatics and molecular biology of cancer
- Research of hormonally active substances in food and the environment
- Model systems of invertebrates
- Molecular biology, genomics, genome editing

## Research Areas

The Laboratory of Molecular Pathology focuses primarily on the possible involvement of nuclear receptors in cancers and other metabolic diseases. The research strategy is centered on nuclear receptors in Diploblasts that are likely to be closely related to Deuterostome ancestors. The laboratory also studies the regulation of metabolism and development in flatworms and in *Caenorhabditis elegans* and searches for parallel pathways in mammalian cell lines and in human cancers.

In our working hypothesis Deuterostomes are a sister group to Diploblasts. Modern species evolved in parallel from an evolutionary time point in the Precambrian era. Protostomes evolved more distantly laterally. We view cancers as tissues acquiring archetypical cellular behavior. We search for the regulatory roles of nuclear receptors in this archetypical behavior of cells with the aim to contribute to the understanding of the role of nuclear receptors in cancers.

## Publications

- Novotny JP, Chughtai AA, Kostrouchova M, Kostrouchova V, Kostrouch D, Kassak F, Kana R, Schierwater B, Kostrouchova M, and Kostrouch Z. 2017. *Trichoplax adhaerens reveals a network of nuclear receptors sensitive to 9-cis-retinoic acid at the base of metazoan evolution*. PeerJ 5:e3789. 10.7717/peerj.3789
- Kostrouchova M, Kostrouch D, Chughtai AA, Kassak F, Novotny JP, Kostrouchova V, Benda A, Krause MW, Saudek V, Kostrouchova M, and Kostrouch Z. 2017. *The nematode homologue of Mediator complex subunit 28, F28F8.5, is a critical regulator of C. elegans development*. PeerJ 5:e3390. 10.7717/peerj.3390
- Chughtai AA, Kassak F, Kostrouchova M, Novotny JP, Krause MW, Saudek V, Kostrouch Z, and Kostrouchova M. 2015. *Perilipin-related protein regulates lipid metabolism in C. elegans*. PeerJ 3:e1213. 10.7717/peerj.1213
- Kostrouchova M, and Kostrouch Z. 2015. *Nuclear receptors in nematode development: Natural experiments made by a phylum*. Biochim Biophys Acta 1849:224-237. 10.1016/j.bbarm.2014.06.016
- Kostrouch D, Kostrouchova M, Yilma P, Chughtai AA, Novotny JP, Novak P, Kostrouchova V, Kostrouchova M, and Kostrouch Z. 2014. *SKIP and BIR-1/Survivin have potential to integrate proteome status with gene expression*. J Proteomics 110:93-106. 10.1016/j.jprot.2014.07.023

## Are you interested in this expertise?

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## Experts and their department

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