
Laboratory of Cellular Regenerative Medicine

Offer

- Isolation and cultivation of primary cells from various tissues
- Cultivation of commercial available cell lines
- Cell viability measurement
- Cytotoxicity measurement
- Immunogenicity measurement
- Evaluation of material biocompatibility
- Evaluation of cell adhesion and migration on bio-materials
- Fluorescent and confocal microscopy, including real-time monitoring
- Cell analysis by flow cytometry
- Cell sorting
- Measurement of protein expression by ELISA and Luminex techniques
- Eukaryotic cells transformation – transfection, electroporation
- Image analysis (e.g. objects counts, lengths, areas or angles, image stitching, picture thresholding)
- Consultation and advisory during study design
- Statistical analysis (data distribution, testing of hypothesis)
- Cooperation on data interpretation

Expertise

We explore mechanisms governing regeneration of some organs and tissues. Particularly, we are focused on three fields:

The role of stem cells in regeneration generally

- We investigate, how the stem cells are stimulated to regeneration behavior, how they are attracted into site of injury, and how the regeneration process occurs.

Application potential of stem cells in liver regeneration

- We study if and how extrahepatic stem cells (i.e. stem cells out of liver) could support liver regeneration and which mechanisms are utilized – hepatodifferentiation, paracrine effect or cell fusion.

The role of dermal fibroblasts in wound healing

- We are interested in the ability of dermal fibroblasts to participate in the regulation of healing process, particularly in the persistence of chronic inflammation in the wound site.

Key Research Equipment

We are well trained in cell isolation and culture, immunocytochemistry, flow cytometry, proteins quantification by Luminex and ELISA methods, cell viability and proliferation analysis. At all projects we also focus on the perfect study design and statistics.

To guarantee quality standard, well established methods are performed under standard operating protocols.

- Essential stuff and machines of cell culture laboratory
- FACSAria™ Fusion, BD Bioscience
- FACSVerse™ Flow cytometer, BD Bioscience
- Luminex® 200™, Luminex
- Inverted fluorescence microscope IX83, Olympus
- Synergy HT and Synergy H1 Microplate readers, Biotek

Members

- Lucie Vištejnová, Ph.D., M.Sc. – Research Group Leader
- Dra. Azalia Mariel Carranza-Trejo

- Martina Dolejšová, M.Sc.
- Monika Holubová, Ph.D., M.Sc.
- Assoc. Prof. Daniel Lysák, M.D., Ph.D.
- Adam Skalický, M.D.
- Anna Stunová, M.Sc.
- Iveta Zímová, B.Sc.

Selected Publications

- Vistejnova L., Safrankova B., Nesporova K., Slavkovsky R., Hermannova M., Hosek P., Velebny V., Kubala L.: *Low molecular weight hyaluronan mediated CD44 dependent induction of IL-6 and chemokines in human dermal fibroblasts potentiates innate immune response*. Cytokine. 70, 97–103, 2014
- Smejkalova D., Nesporova K., Hermannova M., Huerta-Angeles G., Coziková G., Vistejnova L., Safrankova B., Novotny J., Kucerik J., Velebny V.: *Paclitaxel isomerisation in polymeric micelles based on hydrophobized hyaluronic acid*. Int J Pharmaceut. 466, 147–155, 2014
- Smejkalová D., Hermannova M., Buffa R., Cozikova D., Vistejnova L., Matulkova Z., Hrabica J., Velebny V.: *Structural characterization and biological properties of degradation byproducts from hyaluronan after acid hydrolysis*. Carbohydrate Polymers. 88, 1425–1434, 2012
- Vistejnova L., Dvorakova J., Hasova M., Muthny T., Velebny V., Soucek K., Kubala L.: *The comparison of impedance-based method of cell proliferation monitoring with commonly used metabolic-based techniques*. Neuroendocrinol Lett. 30, 121–127, Suppl. 1, 2009
- Betak, J., Buffa, R., Nemcova, M., Pitucha, P., Kulhanek, J., Matejkova, I., Novakova, J., Vistejnova, L., Klein, P., Pravda, M., Kubickova, G., Broulikova, M., Felgrova, M., Velebny, V.: *Method for preparing textile-treatable endless mono- and multifilaments, involves matching fibers and fabrics to form uniform gel layer, and performing through surface modification of fibrous material*. WO2014082610-A1, 2014
- Smejkalova, D., Huerta-Angeles, G., Bobek, M., Hermannova, M., Vistejnova, L., Novotny, J., Prikopova, E., Nesporova, K., Nemcova, M., Slezingerova, K., Kulhanek, J., Cozikova, D., Sogorkova, J., Kucera, J., Klein, P., Velebny, V.: *New substituted acylated derivatives of hyaluronic acid, useful in the nanomicellar composition, which is useful in pharmaceutical or cosmetic applications, preferably topical applications*. WO2014082609-A1, 2014

Are you interested in this expertise?

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Experts and their department

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