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RESEARCH AREA

Development of high throughput screening methods and molecular library screening to identify compounds that influence autophagy and other biological processes. Molecule library screening allows the investigation of existing drugs for new therapeutic purposes (drug repurposing). Our goal is to detect compounds that boost cancer cell elimination. The student will perform Antibody-Dependent Cell-Mediated Cytotoxicity (ADCC) assays. ADCC involves bridging target cells (e.g. virus-infected or cancer cells) and effector cells [e.g. natural killer (NK) cells or macrophages] with an antibody. The latter binds specifically to a cell surface antigen on the target cell while the constant region (Fc fragment) binds to the Fc receptor on the effector cells. We plan to set up assays for the quantification of cancer cell killing by NK cells and to perform high-content screening to identify ADCC enhancing drug candidates from drug libraries.

TECHNIQUES AVAILABLE IN THE LAB

Cell culture, working with co-cultures, viability assays, cytotoxicity assays, image analysis with different software, immunofluorescence, detection of proteins with Western blotting, confocal microscopy, flow cytometry, quantitative PCR.

SELECTED PUBLICATIONS

Guti, E., Regdon, Z., Sturniolo, I., Kiss, A., **Kovács, K.**, Demény, M., Szőőr, Á., Vereb, G., Szöllősi, J., Hegedűs, C., Polgár, Z., Virág, L. (2022) The multitargeted receptor tyrosine kinase inhibitor sunitinib induces resistance of HER2 positive breast cancer cells to trastuzumab-mediated ADCC. **Cancer Immunol Immunother**

Regdon, Z., Robaszkiewicz, A., **Kovács, K.**, Rygielska, Ż., Hegedűs, C., Bodoor, K., Szabó, É., Virág, L. (2019) LPS protects macrophages from AIF-independent parthanatos by downregulation of PARP1 expression, induction of SOD2 expression, and a metabolic shift to aerobic glycolysis. **Free Radic Biol Med** **131**: 184-196.

Kovács, K., Erdélyi, K., Hegedus, Cs., Lakatos, P., Regdon, Zs., Bai, P., Haskó, Gy., Szabó, É., Virág, L. (2012) Poly(ADP-ribose) ation is a survival mechanism in cigarette smoke-induced and hydrogen peroxide-mediated cell death. **Free Radic Biol Med** **53**: 1680-8.