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RESEARCH AREA

The general strategy to treat cancer relies largely on traditional chemotherapy using small molecular drugs. Although conventional chemotherapy has a decent success rate it frequently causes severe side effects and can even result in the evolution of multidrug resistant cancer phenotypes. Nanoparticle based treatment of solid tumors is regarded as a novel, attractive strategy to improve cancer therapy, since approximately 10-200 nm sized materials are selectively accumulated in tumor tissues due to the passive targeting effect, where many of them, especially metallic particles can exert direct anti-cancer activity. Owing to their large surface area nanomaterials can also serve as controllable delivery platforms of various cytotoxic drugs for active tumor targeting. Our research group investigates the cellular and molecular events behind the anti-cancer activity of different types of metal nanoparticles in *in vitro* and *in vivo* animal model systems.

TECHNIQUES AVAILABLE IN THE LAB

Standard cell and tissue culture techniques, *in vitro* model systems, co-cultures, testing drugs and nanomaterials, toxicity screens, cell migration and invasion assays, biochemical and molecular biology methods, ELISA, Western blot analysis, RT-qPCR, next generation sequencing, fluorescent and confocal microscopy, histological analysis, immunocytochemistry, reporter systems, gene silencing.

SELECTED PUBLICATIONS

Gopisetty, M.K., Kovács, D., Igaz, N., Rónavári, A., Bélteky, P., Rázga, Z., Venglovecz, V., Csoboz, B., Boros, I.M., Kónya, Z., **Kiricsi, M.** (2019) Endoplasmic reticulum stress: major player in size-dependent inhibition of P - glycoprotein by silver nanoparticles in multidrug-resistant breast cancer cells. **J Nanobiotechnol 17:** 9.

Huliák, I., Bodai, L., Czepán, M., Kovács, D., Szabó, A., Tiszlavicz, L., Lázár, G., Rakonczay, Z. Jr, Hegyi, P., Boros, I.M., **Kiricsi, M.** (2019) Genetic, epigenetic and transcriptional comparison of esophagus tumor-associated and adjacent normal myofibroblasts. **Oncology Rep 41:** 839-852.

Igaz, N., Kovács, D., Rázga, Z., Kónya, Z., Boros, I.M., **Kiricsi, M.** (2016) Modulating chromatin structure and DNA accessibility by deacetylase inhibition enhances the anticancer activity of silver nanoparticles. **Colloids Surf B Biointerfaces 146:** 670-7.

Kovács, D., Igaz, N., Keskeny, C., Bélteky, P., Tóth, T., Gáspár, R., Madarász, D., Rázga, Z., Kónya, Z., Boros, I.M., **Kiricsi, M.** (2016) Silver nanoparticles defeat p53-positive and p53-negative osteosarcoma cells by triggering mitochondrial stress and apoptosis. **Sci Rep 6:** 27902.

Kovács, D., Szőke, K., Igaz, N., Spengler, G., Molnár, J., Tóth, T., Madarász, D., Rázga, Z., Kónya, Z., Boros, I.M., **Kiricsi, M.** (2016) Silver nanoparticles modulate ABC transporter activity and enhance chemotherapy in multidrug resistant cancer. **Nanomedicine 12:** 601-10.