

10th World Congress on

Medicinal Chemistry and Drug Design

June 14-15, 2018 | Barcelona, Spain

Pharmacologic ascorbate and ferroptosis

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Pharmacologic (mM) concentration of ascorbate induces oxidative stress through the Fenton reaction. Cancer cells are known to show higher sensitivity towards ROS as normal cells. The mechanism of the induced cytotoxicity is still to be elucidated and involves oxidative stress, glutathione depletion, lipid peroxidation, the elevation of labile iron pool and caspase independency. In the frame of a large scale screening experiment to explore chemical compounds with killing effect on tumor cells a new chemical compound, erastin was identified which could induce cell death (ferroptosis) of RASmutant tumor cells. The morphology, biochemistry and genetics of ferroptosis differs considerably from other cell death types, such as apoptosis, necrosis, and autophagy and show high similarity as listed above which lead us to hypothesize that ferroptosis (at least partly) is responsible for ascorbate induced cytotoxicity in cancer cells.

Recent Publications

1. Tamás Lőrincz, Katalin Jemnitz, Tamás Kardon, József Mandl, András Szarka
2. Ferroptosis is Involved in Acetaminophen Induced Cell Death
3. Pathology Oncology Research 21:(4) pp. 1115-21. (2015)
4. Tamás Lőrincz, András Szarka
5. The determination of hepatic glutathione at tissue and subcellular level
6. Journal of Pharmacological and Toxicological Methods 88: pp. 32-39. (2017)
7. Szilvia Z Tóth, Tamás Lőrincz, András Szarka
8. Concentration Does Matter: The Beneficial and Potentially Harmful Effects of
9. Ascorbate in Humans and Plants
10. Antioxidants and Redox Signaling [Epub ahead of print] (2017)
11. Area of research interest: cell death, *in vitro* toxicology, antitumor pharmacology

Biography

Tamas Lorincz has an MSc. degree in biochemical engineering and is a PhD candidate in the group lead by Professor Dr. Andras Szarka at Budapest University of Technology and Economics. Tamás Lőrincz received a Gedeon Richter Plc. Talentum PhD. scholarship in 2014 and the New National Excellence Program scholarship of the Hungarian Ministry of Human Capacities in 2017.

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