

Plasma thioredoxin reductase (TrxR) is a novel clinical biomarker of the early-stage diagnosis and treatment of cancer

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Developing a novel and efficient biomarker for detecting malignant tumors is essential for the early-stage diagnosis of cancer. Thioredoxin reductase is a critical catalytic enzyme involved in the biosynthesis of deoxyribonucleotides and regulation of cellular redox state, and found to be overexpressed in multiple types of cancer. Mechanistically, TrxR has been known to mediate multiple biological processes in cancer cells, including cell cycle progression, cell apoptosis, and ROS accumulation; while several TrxR inhibitors were also designed as anticancer drugs and are currently under clinical trials. By using our patent-protected and China FDA-approved TrxR detection assay, plasma TrxR activities of > 10,000 clinical subjects (malignant tumor patient vs. healthy subject) were measured and data were collected for statistical analyses. As a result, plasma TrxR activity level was observed to be significantly higher in malignant patients (TrxR > 12.0 U/mL) compared with normal group (TrxR < 4.0 U/mL) or non-malignant patients. Interestingly, TrxR activation in tumor samples was dramatically reduced after various anti-cancer treatment including surgery and radio-/chemo-therapy. All these evidences suggest that TrxR activity is an effective clinical biomarker of hyperplasia and carcinoma, and can be applied to detect tumor at early-stage and monitor the therapeutic outcome. Therefore, this study will significantly impact our current view on the clinical biomarker in hyperplasia and carcinoma.

Biography

Dr. Hanwei Yin received his Ph.D from Northwestern University in Cellular and Cancer Biology. He joined Keaise Medicine in 2015, and is currently the director of R&D department. He has published many papers studying the mechanism of benign and malignant tumor development, including the characterization of TrxR as a novel clinical biomarker in hyperplasia and carcinoma, and study of TrxR inhibitors in clinical trials. He is currently leading a group to develop a combinational approach using TrxR with other biomarkers in the early-stage diagnosis and treatment of cancer.