Over 35 million new cancer cases are predicted in 2050. Great progress in development of therapies against some cancer types has been achieved. However new anticancer drugs and therapies are continuously needed. To invent them a specific traits of cancer cells can be utilized. One of them is high concentration of reactive oxygen species (ROS) in cancer cells. ROS are abundant in non-tumorigenic cells as well. They play a myriad of roles including signal transduction. Elevated ROS concentrations are characterized for inflammation and other pathological states. Fast proliferating cancers cells are also characterized by increased concentration of ROS. Cells have molecular mechanisms which counteract increased ROS concentration but if concentration of ROS is very high cell will demise. The goal of herein proposal is to capitalize on this phenomena by design and obtaining of iron-containing ROS generators called bisFc. Molecules of bisFc will act as ROS amplifiers to cancer cells. Once concertation of ROS generated by bisFc in cancer cells be high enough they will die. In non-tumorigenic cells ROS activation will be on the negligible (low) level. Thus “healthy” cells remain unaffected by the bisFc compounds. This is why we call bisFc intelligent anticancer agents.