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## Chemopotentiatiion by Low-Dose-Fractionated Radiation Therapy

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The emerging concept of chemopotentiatiion by Low Dose Fractionated Radiation Therapy (LDFRT) is not fully understood but builds on the phenomenon of low-dose hyper-radiosensitivity (HRS). This new paradigm allows the use of full dose systemic chemotherapy safely in combination with LDFRT, where the low-dose radiation sensitizes the tumor to subsequent chemotherapy. Using a RT2 PCR Profiler Array, we identified Dual Oxidase 2 (DUOX2), an enzyme functioning in the production of hydrogen peroxide, as a major mediator of chemopotentiatiion by LDFRT. Down regulation of DUOX2 increased radioresistance at every radiation doses tested. In addition, our data indicate that Reactive Oxygen Species increase up to 3.5 fold in cells exposed to LDFRT and a modified regimen of Docetaxel, Cisplatin, and 5'-fluorouracil (mDCF). Furthermore, inhibition of NADPH oxidase abrogated the killing efficiency of this combined regimen in human gastric cancer cells. Taken together, these data suggest that chemopotentiatiion by LDFRT may be due, at least in part, to increased ROS production (DUOX2) without upregulation of the DNA repair machinery. These data thus provide a rationale for further explorations of potential clinical applications of LDFRT, such as in Whole abdominal radiotherapy, as a chemopotentiator for advanced and metastatic gastric cancers.

### Biography

France Carrier is a tenured Associate Professor in the Department of Radiation Oncology at the University of Maryland, School of Medicine in Baltimore, MD, USA. Her laboratory focuses on basic and translational cancer research with emphasis on molecular events underlying cancer progression and most specifically DNA damage responses. She is particularly interested in the activation of RNA binding proteins, HDACs and Low Dose Fractionated Radiation Therapy. She is a National Institutes Health funded investigator and has published more than 60 peer reviewed articles and book chapters. Her papers have been cited more than 6,500 times.

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