

International Conference on Emerging Cell Therapies

October 1-3, 2012 DoubleTree by Hilton Chicago-North Shore, USA

New generations improved detection via nano microfluidics-based devices and nanodelivery to colon cancer therapy

Jagat Kanwar Deakin University, Australia

We and others have found that survivin, a member of the family of inhibitor of apoptosis proteins that is overexpressed in several human tumours. Lactoferrin is also known to express in inflammatory diseases such as inflammatory bowel disease and Crohn's disease. We assessed the differential expression of survivin, other apoptotic biomarkers and lactoferrin in stool and serum samples of colorectal cancer (CRC) patients. Three different detection systems were compared and Microfluidics-Device Based system was found to be most sensitive and specific for diagnosis. Our findings also suggest that the reduction in the serum survivin and copro-lactoferrin levels of advanced CRC patients after chemotherapy can be used as a predictor of response to the chemotherapy but not that of survival. In addition, we developed dominant negative mutant of survivin (SurR9-C84A) and loaded into Alginate enclosed chitosan- calcium phosphate nano carriers (ACSC-NCs), in order to improve the oral bioavailability and to protect the peptide from the locale of gastro intestinal tract. These CSC-NCs loaded with SurR9-C84A were tested in a xenograft mice model of human colon cancer. We found all tumor bearing mice regressed tumors significantly. Anti-tumor activity was mediated by inducing apoptosis and necrosis in tumours. There was significant decrease in angiogenesis and vasculature in the CSC NCs-SurR9-C84A as compared to empty CSC-NCs ingested control tumor mice. In the present study we developed a safe, nontoxic, mucoadhesive, completely biodegradable, compatible and sustain released CSC-NCs as a proof of concept in colon cancer which can be used for other cancer types. Thus these CSC-NCs can be exploited for oral administration to protect from variable pH in intestinal track and resistance to gastric enzymes which otherwise digest proteins in gastrointestinal tract.

Biography

Jagat R Kanwar is the Head of Nanomedicine-Laboratory of Immunology and Molecular Biomedical Research (LIMBR). Dr. Jagat R Kanwar has received his Master's degree in Medical Biochemistry and PhD in Molecular Immunology. He has an international reputation and expertise in investigating fundamental and applied molecular signalling aspects of pathogenesis of cancer, chronic inflammation and neurodegenerative diseases, thereby, leading to the development of treatment strategies from bench to bedside. He has more than 100 publications in high impact factor and peer reviewed international journals, 17 book chapters and 2 edited books. He serves as an Editor, Reviewer and Editorial Advisory Board Member of more than 18 international journals and was invited as a speaker in more than 40 conferences and chaired sessions in conferences and scientific meetings on Cancer, Immunology, Vaccines, Microbial infections, Nanotechnology, Nanomedicine and Biotechnology. He has been an a regular grant reviewer for national, international and corporate funding agencies.

jagat.kanwar@deakin.edu.au