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Antiproliferative activity of bacterial proteins against MDA-MB-231 human breast adenocarcinoma and Hepg2 human hepatocellular carcinoma cells

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Cancer is one of the most dangerous human diseases, expected to kill about 13.3 million people annually by 2030. Protein extracts of *Lactobacillus sps* (MTCC 4184, 9496 and 10093), *Bacillus cereus* (MTCC 7166, 9017 and 10202), *Serratia marcence* (MTCC 7641, 7298 and 7729), *Shigella flexneri* (MTCC 1457 and 9543) were evaluated for anticancer potential against human cancer cell lines MDA-MB-231 and Hep-G2. Inhibition of cancer cells proliferation and apoptosis was confirmed by MTT Cell Viability Assay, Fluorescent Staining, Caspase-3 activity, DNA fragmentation and cell cycle analysis by Flowcytometry. The results showed that protein extract of *Lactobacillus sps* (MTCC 4184), *Bacillus cereus* (MTCC 10202) and *Shigella flexneri* (MTCC 9543) inhibited both MDA-MB-231 and HepG2 cancer cell lines. Protein extract of *Lactobacillus sps* (MTCC 9496), *Serratia marcence* (MTCC 7298 and 7729) and *Bacillus cereus* (MTCC 7166) inhibited growth of MDA-MB-231, while no effect on HepG2 was observed. Protein extract of *Lactobacillus sps* (MTCC 10093), *Bacillus cereus* (MTCC 2763), *Serratia marcence* (MTCC 7641) and *Shigella flexneri* (MTCC1457) were none effective to any of the cell lines. The cancer cell mortality was observed from 52% to 71% $\pm$ 2%. Fluorescent staining and increased Caspase 3 activity confirmed by western blotting, DNA fragmentation and detection of cell cycle arrest by Flow cytometry suggested that apoptosis was the major mechanism in inhibition of MDA-MB-231 human breast adenocarcinoma and Hep-G2 human hepatocellular carcinoma cells. The study confirms the anticancer potential of bacterial proteins which may constitute valuable candidates for development of novel anticancer drugs.

Biography

Asvene K Sharma has completed his PhD in Molecular Biology from CCS University Meerut. He is working as Young Scientist Fellow at Department of Biotechnology, Indian Institute of Technology-Roorkee, India and is working as a Principal Investigator for his DST Young Scientist Award Research Project.

Clinicopathological analysis of pulmonary mucoepidermoid carcinoma

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Objective: Mucoepidermoid carcinoma of the lung is a rare malignant neoplasm. We aimed to investigate clinicopathological features, therapies and prognosis of 8 mucoepidermoid carcinoma cases.

Methods: 8 patients underwent surgical treatment for pulmonary mucoepidermoid carcinoma between 2005 and 2012 at Thoracic Surgical Department of West China hospital, Sichuan, China. The clinical data, radiological manifestation, treatment strategy, pathological findings and prognosis of all patients were analyzed retrospectively.

Results: Among the 8 cases (4 males and 4 females), the age ranged from 35 to 71 years old (the mean age was 50.67-year old). Two tumors were located in the upper lobes and three masses were located in the lower lobes. The other three lumps were located in the Left main bronchus, Middle segmental bronchus of right lobe and trachea respectively. The characteristics of the tumours were consistent with low grade mucoepidermoid carcinoma (n=6) and high grade mucoepidermoid carcinoma (n=2). All of the patients were sent for oncological evaluations, and three patients with N1 or N2 disease received chemotherapy. One of the patients died from brain metastasis at 15 months. Seven of the eight patients were alive at the time of evaluation. The median survival time was 40 (range 8–88) months.

Conclusion: Mucoepidermoid tumors have to be treated by radical surgery with lymph node sampling and dissection. Patients with low grade tumors can be expected to be cured following complete resection. Careful histological typing plays a key role in prediction of late results and further studies are needed.