HEALTH BULLETIN BOARD

THE SHILLONG TIMES (24-10-2016 PG.7)

http://epaper.theshillongtimes.com/epapermain.aspx?pgno=7&eddate=2016-10-24&edcode=820009

Onion compound may help fight ovarian cancer: Study

A natural compound isolated from onions may help treat the most common type of ovarian cancer, a new study has claimed. Researchers from Kumamoto University in Japan studied the effects of a natural onion compound, onionin A (ONA), on a preclinical model of epithelial ovarian cancer (EOC) both in vivo and in vitro.

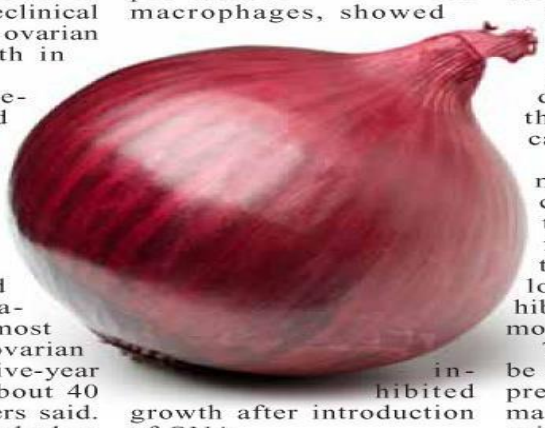
Previously, researchers found that ONA suppressed pro-tumour activation of host myeloid cells.

According to a 2014 review of cancer medicines from the World Health Organisation, EOC is the most common type of ovarian cancer and has a five-year survival rate of about 40 per cent, researchers said.

It has a relatively low lifetime risk that is less than one per cent, but that can increase up to 40 per cent if there is a family history of the disease.

A majority of patients (80 per cent) experience a relapse after their initial treatment with chemotherapy; therefore, a more effective line of treatment is needed.

The group's in vitro experiments showed that EOCs, which usually proliferate in the presence of pro-tumour M2 macrophages, showed



inhibited growth after introduction of ONA.

This was thought to be due to ONA influence on STAT3, a transcription factor known to be involved in both M2 polarisation and cancer cell proliferation.

The team also found that ONA inhibited the pro-tumour functions of myeloid-derived suppressor cells (MDSC), which are associated with the suppression of the anti-tumour immune response of host lymph-ocytes, by using preclinical sarcoma model.

ONA was also found to enhance the effects of anti-cancer drugs by strengthening their anti-proliferation capabilities.

Moreover, experiments on an ovarian cancer murine model that investigated the effects of orally administered ONA resulted in longer lifespans and inhibited ovarian cancer tumour development.

This was considered to be a result of ONA's suppression of M2 polarised macrophages, researchers said.

The study shows that ONA reduces the progression of malignant ovarian cancer tumours by interfering with the pro-tumour function of myeloid cells. (*PTI*)

THE TELEGRAPH (24-10-2016 Monday Pg.14)

http://epaper.telegraphindia.com/paper/14-0-24@10@2016-1008.html

CANCER CHASE

There is no viable treatment for pancreatic cancer but two Indian researchers are pursuing possible remedies.

T.V. Jayan reports

ILLUSTRATION: MANISH MOITRA

Their similarities are rather striking. Priyabrata Mukherjee and Yangsom Bhutia — both India-born scientists in the US — share a dream; slaying a tumour monster. They want to target pancreatic cancer, whose diagnosis is often branded a death sentence as drugs and radiation have little impact on the disease.

Even though it affects fewer people compared to breast and lung cancers, pancreatic cancer is more deadly as it has a very high mortality rate.

Despite advances in conventional therapies targeting cancer cells, the survival rate of pancreatic cancer patients has remained relatively unchanged in the last 40 years. Apple founder Steve Jobs succumbed to a rare form of it in 2011.

In two unconnected studies last week, researchers led by Mukherjee and Bhutia announced novel means to stem the growth of pancreatic cancer cells, thereby raising hopes of finding potential therapies for the tumour, which is the fourth leading cause of cancer deaths in the world.

Mukherjee and Bhutia hail from neighbouring states in India — West Bengal and Sikkim — and interestingly, work in neighbouring states in the US — Oklahoma and Texas. Both their research teams also have an unusually large number of researchers of Indian descent.

While Mukherjee's team at the University of Okhlahoma Health Science Center is exploiting a unique chemical property of gold nanoparticles to check tumour growth, Bhutia and his colleagues at Texas Tech University Health Sciences Center are targeting a protein that supplies amino acids to cancer cells. Blocking it will stymie the tumour's potential to spread to healthy cells.

Pancreatic cancer is a silent killer. Patients do not exhibit any symptoms till the disease enters an advanced stage. By then, the tumour would have invariable metastasised to the surrounding tissues from the pancreas that is deeply seated. Even if the disease is detected early by chance, patients develop resistance to the drug (gemcitabine is the drug of choice for pancreatic cancer) because of persistent use, and thus have a relapse.

While it is too early to say whether any of these studies will go through to clinical stage successfully, the initial research has held out promise.

Mukherjee's team, for instance, has shown using mouse models that gold nanoparticles can actually reduce tumour cell proliferation and migration. Their work appeared in a journal called *ACS Nano* last week.

Exploiting gold's unique chemical affinity toward molecules containing two specific chemical groups that are normally present in the cells, the scientists eavesdropped on things that happen in and around tumour cells. According to Mukherjee, understanding what happens in cells that are around tumour cells is important because emerging evidence has suggested that these friendly neighbours help cancer cells avoid the effect of chemotherapy drugs.

"It is critical to understand how different cells in the tumour microenvironment communicate with each other. (In this study), we are utilising gold nanoparticles to understand that process of complex communication and to block that communication," says Mukherjee, who hails from Champarui village in Hooghly district.

By blocking this communication — which is responsible for this cancer's lethal nature — the gold nanoparticles reduce cell proliferation and migration which are implicated in the spread of tumour to other organs.

This particularly targets the cancer promoting effects of a class of cells called pancreatic stellate cells. In a healthy pancreas, stellate cells exist in a dormant stage, storing abundant supplies of vitamin A. But, when pancreatic ductal adenocarcinoma — the most common and aggressive type of pancreatic cancer that affects 95 per cent of pancreatic cancer patients -- occurs, these stellate cells are activated. They form a dense connective tissue around the tumour, which is used by cancer cells to spread to other parts of the body.

Mukherjee is hopeful that deciphering the complex cellular communication that prevails in the tumour microenvironment will help them better understand how cancer develops and survives even when treated with drugs. This understanding, he hopes, will help medical scientists develop more effective drugs. The team has in fact successfully explored similar effect of gold nanoparticles in ovarian cancer in previous studies.

The work being done by Bhutia and his colleagues is more direct. Their studies, reported recently in the *British Journal of Pharmacology*, have found that compared to healthy pancreatic cells a protein called SLC6A14 is overexpressed by several fold in tumour cells taken from pancreatic cancer patients. In bench as well as mice studies, the scientists found that blocking this protein starves the cancer cells of amino acids which are critical for their growth and proliferation.

"SLC6A14 can be a very good drug target for pancreatic cancer," says Bhutia, who lived in Gangtok before moving to the US in 2009, following his PhD from the Indian Veterinary Research Institute in Izatnagar near Bareilly in UP.

Previous studies by Bhutia and other scientists have noticed overexpression of SLC6A14 in cancer of other organs such as the colon, cervical and breast. The expression of the protein is immensely higher in pancreatic cancer, says Bhutia.

Besides, targeting this protein may be devoid of side effects. "Since SLC6A14 is specifically upregulated in cancer cells, it may be possible to specifically target cancer cells with less untoward effects to normal cells. So, the goal is to starve the tumour cells to death," explains Bhutia.