Calculated risk

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A simple blood test may be able to identify those most at risk for developing head and neck cancer as a result of smoking. This was the finding of a recent study by Prof. Zvi Livneh, Head of the Weizmann Institute's Biological Chemistry Department, Dr. Tamar Paz-Elizur of the same department, and their research team that worked in collaboration with Dr. Rami Ben-Yosef of Tel Aviv-Sourasky Medical Center, Prof. Laurence Freedman of Sheba Medical Center and Prof. Edna Schechtman of Ben-Gurion University of the Negev.

Livneh's research deals with repair mechanisms for DNA, the material of genes. Cells maintain sophisticated repair systems to prevent the accumulation of mutations that might lead to cancer. In these systems, molecular detectors scan the DNA for injury. A sort of local operation is then performed to cut out and dispose of the damaged segment and replace it with a new one.

In their study, which appeared in *Cancer Research*, the scientists asked whether a reduced individual ability (non-inherited) to repair DNA damage increases chances of getting head and neck cancer. Smoking damages DNA and is known to be a major cause of this disease, which can affect the throat, mouth and larynx. The researchers focused on a DNA repair enzyme called OGG1, for which they had previously developed a blood test to measure activity levels. By comparing OGG activity in healthy people with those in head and neck cancer patients, the research team found that the test was able to single out those with a heightened risk of this type of cancer: Weak levels were correlated with greater risk. According to Prof. Livneh, a smoker with low OGG activity

is 70 times more likely to develop head and neck cancer than a non-smoker with normal OGG levels.

These findings join a previous study by the group in which they found that low OGG activity is an indicator of elevated risk for lung cancer, a disease also caused by smoking. Together, these studies show that a combination of low OGG activity and smoking can skyrocket a person's chances of becoming ill with a smoking-related cancer. Also participating in the study were Dalia Elinger of the Biological Chemistry Department, Dr. Akiva Vexler of Tel Aviv-Sourasky Medical Center, Profs. Adi Shani and Alain Berrebi of Kaplan Medical Center, and Dr. Meir Krupsky of Sheba Medical Center.

The OGG blood test might be used, in the future, to identify those most at risk for lung and head and neck cancers, hopefully giving added incentive to those with the risk factor to quit smoking. In addition, drugs might be developed to reduce this risk, similar to those prescribed today to reduce the risk of heart disease.

Source: American Committee for the Weizmann Institute of Science