Molecules may help predict survival in liver cancer

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Tiny molecules that help cells regulate which proteins they make might one day help doctors predict which liver-cancer patients are likely to live longer than others, new research suggests.

Researchers compared levels of molecules called microRNA in tumor cells and adjacent nontumor cells from liver-cancer patients, most of whom also had hepatitis and cirrhosis.

The study found that patients with poor disease-free survival had low overall levels of 19 particular microRNAs compared with those showing better survival after 16 years of follow-up.

The work was led by researchers at the Ohio State University Comprehensive Cancer Center in collaboration with investigators at the Mayo Clinic and the University of Oklahoma Health Sciences Center.

The study is published in the Jan. 15 issue of the journal *Clinical Cancer Research*.

“The findings must be verified in larger groups of patients, but they suggest that we might improve survival in some liver-cancer cases by adding back those microRNAs as a drug,” says principal investigator Thomas D. Schmittgen, associate professor of pharmacy and a researcher with Ohio State’s Comprehensive Cancer Center.

But that possibility will require years of additional laboratory and preclinical research, Schmittgen says.

Liver cancer, or hepatocellular carcinoma, is the third most common cause of cancer death worldwide, killing some 662,000 people in 2005, according to the World Health Organization. The disease is more common in men and is usually caused by hepatitis infection or cirrhosis of the liver.

For this study, Schmittgen and his collaborators examined specimens from 43 liver tumors, 28 of which were paired with nearby nontumor tissue, and specimens from six normal livers. Two-thirds of the cancerous livers also had hepatitis and cirrhosis.

The researchers examined the levels of 196 different microRNAs in liver-cancer cells vs. nearby noncancer cells, and in liver cells with hepatitis and cirrhosis vs. healthy cells.

Both comparisons showed interesting differences in microRNA levels, but the most important finding came when the researchers looked for a correlation between cancer-cell microRNA levels and disease-free survival times in 25 patients for whom disease-free survival data was available.

The analysis showed that patients with poor survival had generally lower levels of 19 particular microRNAs than did patients with significantly better survival.

“This may also be a good clue as to which microRNAs are most important in liver cancer,” Schmittgen says.

Source: Ohio State University Medical Center