Scientist Invented Glasses That Reveal Tumor Cells

Zoe McAlister September 15, 2018

Dr Viktor Gruev, PhD (right) with his team colleague.

Thanks to the revolutionary glasses, surgeons can remove only the diseased tissue and save millions of lives.

(Newswire.net-- September 15, 2018) -- Glasses with a screen and a special camera that can reveal cancer cells sound like a gadget from a science fiction movie. But they are not. Thanks to a young scientist from the Former Yugoslav Republic of Macedonia who lives and works in the USA, this is reality.

They are the invention of the Macedonian scientist Viktor Gruev from the University of Illinois, USA. Victor Gruev (42) can save million lives, his colleagues say. Gruev's invention is a revolution in the medicine world because it enables the precise removal of only diseased cells without affecting healthy tissue.

Inspiration for this camera, dr Gruev found in visual systems of animals and insects. He was especially fascinated by the type of small marine cancer Manis, who use complex eyes with nano cells and extremely sensitive vision sensors to detect sixteen different color of spectra, from blue to infrared, which means they are able to see a few million more colors than a human.

Viktor Gruev was born in Ohrid, and at the age of 15 he went to the US as an exchange student. After he returned to Skopje, the capital of FYR Macedonia, he enrolled in electrical engineering studies, and then in the first year of college he went back to America where he continued his studies.
Gruev got two degrees, electrical engineering and medicine, both at the Ilinois University and obtained his PhD title.

According to dr Gruev, his glasses with a cancer detection camera would cost only $200, which is an affordable price in developing countries such as FYR Macedonia.

"Eight years ago, cooperation with a group of top marine biologists took me to a large coral reef on the Lizard island where scientists examined the hidden world of the ridge that slowly disappears due to a global warming. During these studies, I came to the realization that various animals can see much more than the most modern cameras. Simply, nature has evolved in an evolutionary way to the optimal solution of the eyes of these animals," dr Gruev said in an interview for Macedonian National TV.

"Most were fascinated by small marine crabs, which have the most sophisticated visual system in the animal world. They have more than 16 color receptors. Compared with our visual system, which uses three receptors, their visual system can distinguish small shades of red or other colors, which do not have any differences for us," said dr Gruev

Dr Gruev explains that Marine crabs can distinguish polarization of light. These animals have four pairs of "glasses" for polarization, which they use for mutual communication.

"Me and my team developed a nano-technology camera that can "see" the polarization of light, copying the design from the nature. We started to use it in medicine and there we came to an interesting discovery," dr Gruev said. "The sensors on the camera allowed us to notice the difference between healthy cells and carcinogenic ones."

The biggest asset of this camera, however, is that it is only one centimeter in size. This allows it to be mounted on glasses which surgeons use. A special contrast agent, which is not harmful to patients, is also used, and it goes directly for tumor cells that become fluorescent, detectable to the surgeons equipped with the special pair of glasses.

"My camera can see these carcinogen cells as fluorescent, so the surgeon can spot the exact location of tumor cells and remove them," dr Gruev claims. "So far, the biggest problem in oncologic surgery was to determine how the tumor moves and whether the carcinogenic cells were completely surgically removed. My camera just helps surgeons to determine with precision how much the cancerous cells have spread," he continues.

Dr Gruev's camera is 1,000 times more sensitive than any other camera in the world but the low cost of production make these tumor revealing glasses affordable. Dr Gruev recently developed an even more precise camera, which is a

thousand times better and more sensitive than the previous one.

Dr Gruev is now again in the arena of the scientific and world public with his new invention, an underwater GPS.

GPS doesn't work in water because the signal can't penetrate the surface. However, when light enters the water, it polarizes and gives us information that we can use for GPS.

"So we created an underwater GPS camera based on the polarization of light. As the camera moves or rotates it can detect light changes under water, and based on this, GPS location is determined too," explains Dr Gruev.

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