



Nanotechnology in Health Science and Imaging

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INTRODUCTION

Nanotechnology is the study and application of extremely small things and can be used in fields such as chemistry, biology, physics, materials science, and engineering.

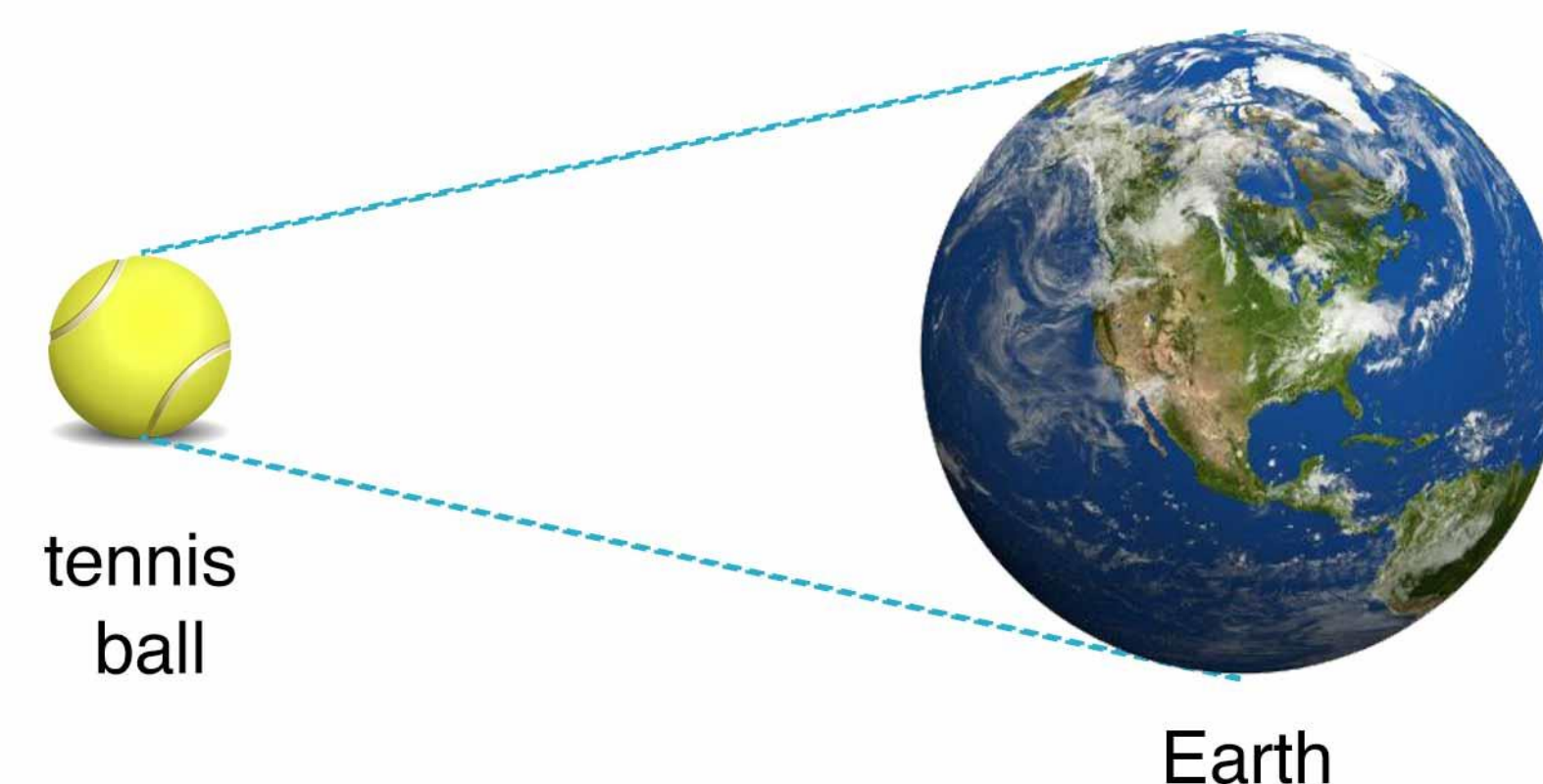
First began in 1981, when the development of the scanning tunneling microscope was able to view individual atoms.

It is very hard to visualize - size of particle is one billionth of a meter.

There are 25,400,000 nanometers in an inch, and one sheet of a newspaper is 100,000 nanometers thick.

Something we are going to focus on in nanotechnology is the way holograms are formed.

One nanometer is to a tennis ball, what a tennis ball is to the Earth.



BACKGROUND

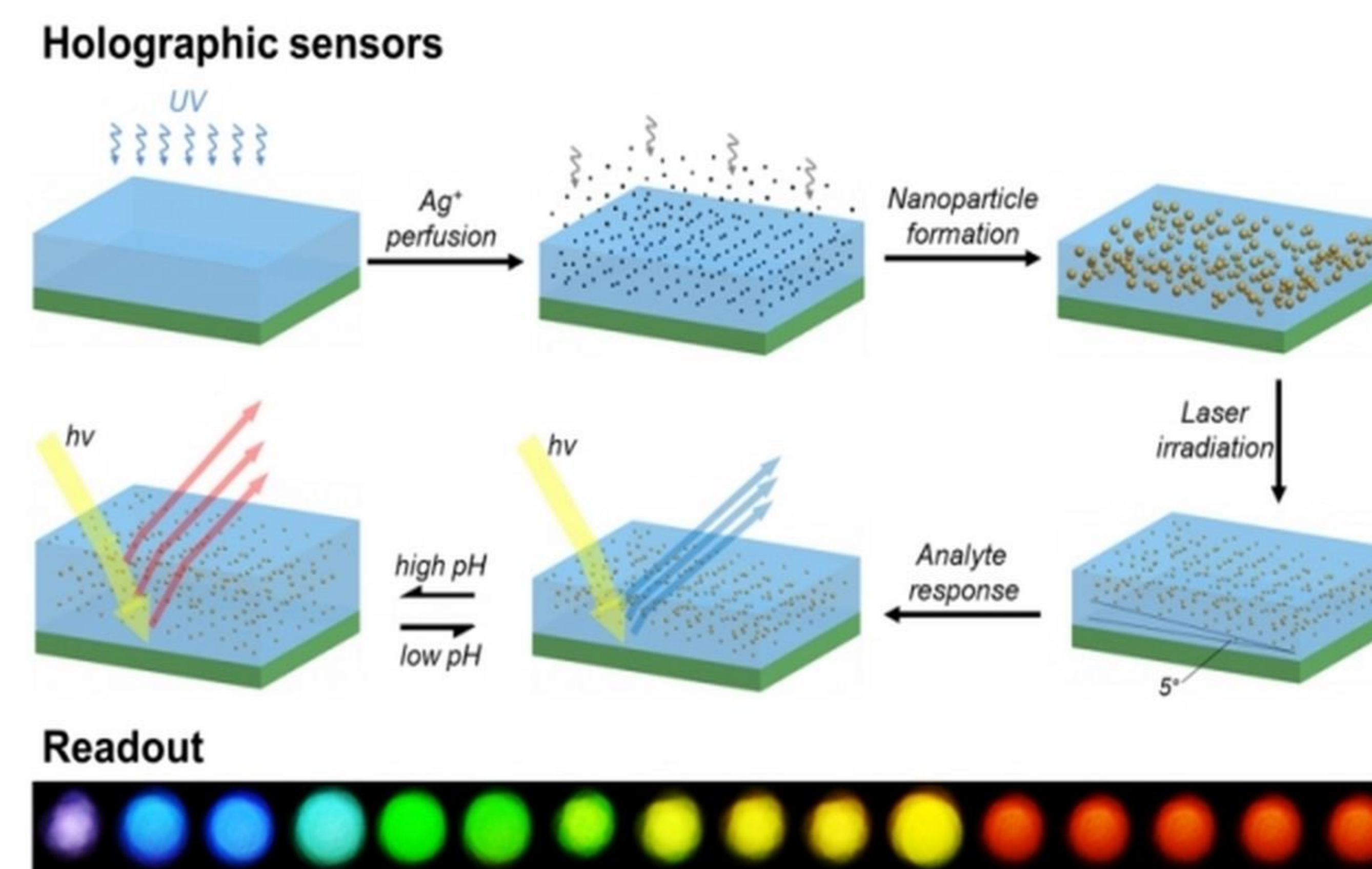
A hologram is a three-dimensional image that is displayed by light beams and nanoparticles.

Between 10 and 100 times smaller than just one pixel.

The nanotechnology field is also involved in holographic sensors, and optical imaging, which is used in the medical field when dealing with certain procedures such as surgical removal of tumors.

RESEARCH

Holographic Sensors



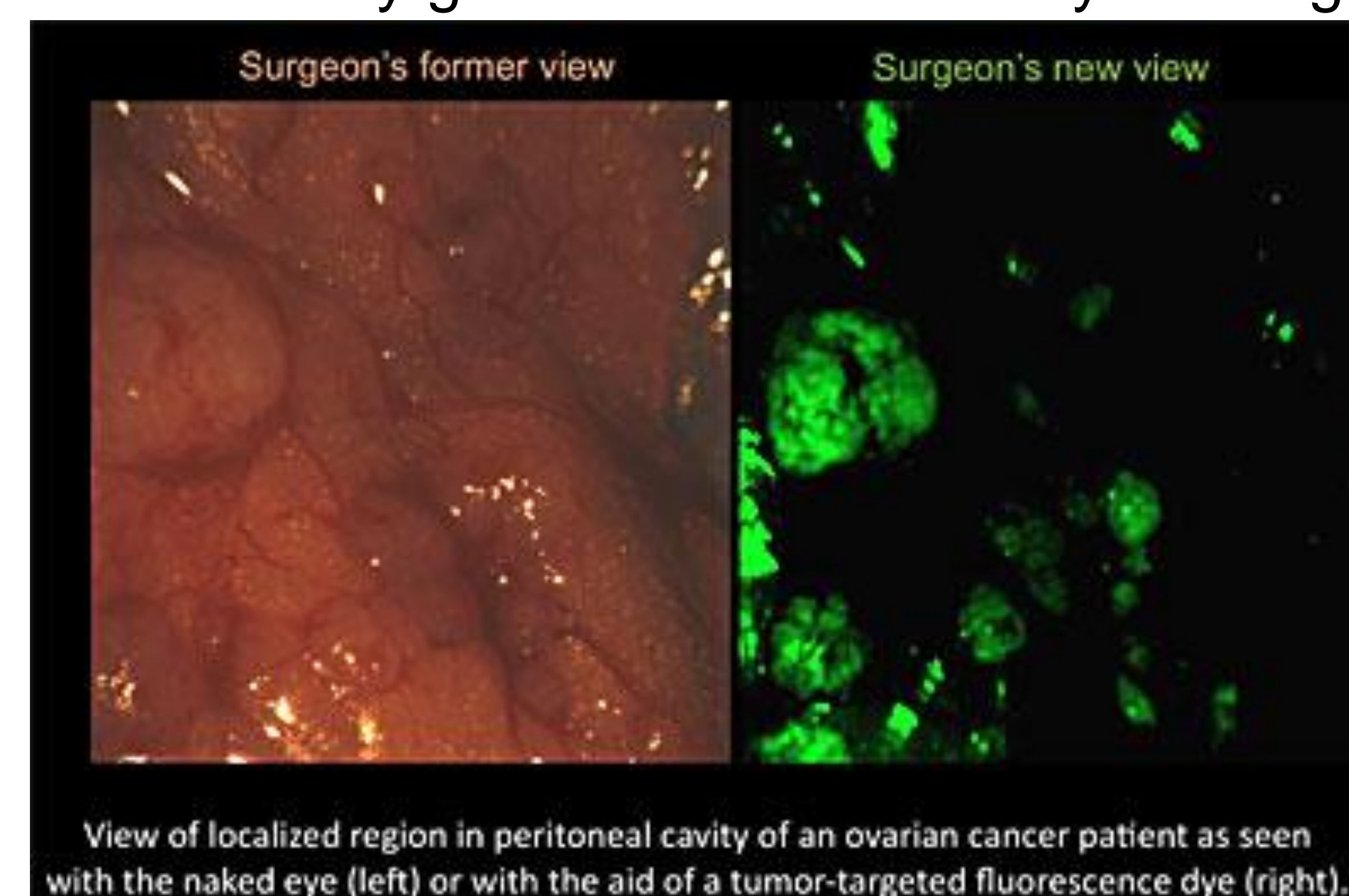
The portable holographic sensors can change colors when it detects disease, drugs, hormones, etc. in your blood, tears, saliva, and breath.

It is possible to design a holographic biosensor from hydrogel, a material similar to contact lenses, infused with silver nanoparticles that form laser pulse 3D holographic technology.

Nano Imaging

Based on magnetic resonance imaging, radioactive substances, emission topography, ultrasonic vibrations, and fluorescent substances.

Optical nano imaging techniques are able to detect tumors that are underneath the skin by ingesting fluorescent coloring agents that accumulate inside of a tumor. They glow when irradiated by laser light



View of localized region in peritoneal cavity of an ovarian cancer patient as seen with the naked eye (left) or with the aid of a tumor-targeted fluorescence dye (right).

CONCLUSION

Nanoparticles are small particles that have a wide variety of uses, including holographic and optical imaging.

Nanoparticles range in size between 1 and 100 nanometers.

Holographic sensors utilize hydrogels and silver nanoparticles to change colors when the particles are detected by the sensors.

There are multiple imaging techniques that make use of nanoparticles that have made great advancements in the medical field.

Nanotechnology, while not relatively new, is still a potent and emerging medical field.

REFERENCES

Nanotechnology – Promissory Note on our Future?

New HOLODEC study in Science on using holography to better understand clouds

'Smart' Holograms Are the Cheap Health Monitors of the Future

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