

**Abstract -**

In 1981, experimenting on leftover Thanksgiving turkey, my IBM colleagues and I discovered excimer laser surgery, laying the foundation for the laser refractive surgical procedures, LASIK and PRK, procedures which more than 25 million people have undergone to correct myopia, astigmatism, and hyperopia. For this discovery, in 2013 we were awarded both the National Medal of Technology and Innovation and the National Academy of Engineering's Russ Prize.

In 1983, while irradiating the skin of live guinea pigs, my colleagues and I discovered that far ultraviolet radiation from an argon fluoride (ArF) excimer laser failed to remove (ablate) tissue after bleeding commenced. The explanation is that the ArF laser radiation is strongly absorbed by an aqueous salt solution, as found in blood, through the process of electron photodetachment from hydrated chloride ions. Such an electronic excitation does not produce heat. We now apply this knowledge to propose a novel technique to debride necrotic tissue associated with burns, decubitus, venous stasis, and neuropathic ulcers, without causing collateral damage to adjacent and underlying viable tissue. We envision a "smart scalpel," enabled by the intrinsic advantage afforded by non-thermal absorption of ArF laser light by aqueous chloride ions.