
New Molecular Imaging Technologies for Detecting Cellular Processes



A group of researchers at Universidad Carlos III de Madrid (UC3M) has designed and developed a biomedical scanner that detects cellular processes at the molecular level and indicates malfunctioning of an organ before said malfunction can produce an anatomical change.

The work carried out by these scientists has ranged from the initial design of an electronic architecture for gamma ray detectors to industry transfer of a complete scanner, after having adequately validated a prototype through experimental studies at the Gregorio Marañón Hospital. The results of this research, headed by professors Juan José Vaquero and Manuel Desco, from the Department of de Bioengineering and Aerospace Engineering at UC3M, have been recently published in the journals *IEEE Transactions on Nuclear Science* and *Physics in Medicine and Biology*.

The electronic technology equipment designed by the researchers, which is in patent process-is based on molecular imaging, a type of biomedical imaging capable of detecting live cellular processes. "These techniques differ from conventional medical imaging in that the information they show is *function* not *form*, which means that they are capable of showing the malfunctioning of an organ before the malfunction turns into an anatomical change," Juan José Vaquero explained. "In other words," he added, "they allow for earlier detection of a possible anomaly, which enormously facilitates treatment." In addition to making an earlier diagnosis possible these types of scanners are used in biomedical research and in pharmaceutical laboratories, for example, to speed up the development of new medicines.

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