

## **Laying Ghosts to Rest: Imaging Function with Structure**

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### **Abstract**

The first decade of the 21st century has seen the introduction of hybrid imaging technologies such as PET/CT and SPECT/CT into clinical practice, technologies that image both structure and function. The adoption of the technology, in particular PET/CT, has been surprisingly rapid. Over the past few years, the clinical benefit to the patient of combined structural and functional imaging compared with acquiring either modality alone has been extensively documented. This has occurred despite the prediction that combining the technology would not encourage or facilitate collaboration between different medical imaging disciplines. The benefit to the patient of a complete assessment of their disease has outweighed the inevitable rivalry between the disciplines. Thus, inspired by the success of PET/CT, the second decade of this century saw the introduction of the latest design of hybrid imaging devices, combined PET and MR, although the clinical role of PET/MR has yet to be established and adoption has been slow, to some extent due to the not insignificant cost. Nevertheless, hybrid, multi-modality imaging is, and will remain, an essential step in the identification and staging of human disease and in designing and monitoring appropriate therapies. With over a decade of experience in the clinic, PET/CT has become the primary imaging modality for staging cancer. As Steven Wainwright commented: "Structure without function is a corpse, function without structure is a ghost". The clinical reality of multi-modality imaging has finally laid to rest the ghosts of function acquired without a corresponding structural framework.