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MEDICAL IMAGING

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Scientific progress is propelled by improved tools of observation. Only with the advent of the telescope could astronomers collect the data that led to theories of planetary motion and gravitation. We are witnessing astonishing improvements in medical imaging, revealing the untold secrets of biology and disease (page S82). This Outlook examines imaging from two perspectives: developments in the technology itself, and applications of imaging to medicine.

One major medical challenge is determining how the brain deteriorates in Alzheimer's disease. Now, imaging is verifying that tangles of tau proteins are leading protagonists (S84). Inflammation is at the core of diverse disorders, from atherosclerosis to cancer, and it is becoming clear that defects in protein clusters known as inflammasomes are primarily to blame. Fluorescent microscopy is starting to show how inflammasomes form and respond to stimuli, and might be worthy therapeutic targets (S86).

Enhanced medical vision makes surgery sharper (S88). Imaging during a breast lumpectomy, for example, allows surgeons to remove the small malignant bits that are often left behind using conventional techniques.

Medical technologists are working on several fronts to improve the quantity and quality of information gathered in a single scan. That often means combining modalities in complementary ways — for example, adding structural information from computed tomography to the functional data from positron emission tomography (S90). And smarter software can focus indistinct blurs (S96). Still, medical imaging is failing to reach its full potential, says Alan Moody. He argues for the creation of “big picture” a network that will enable researchers to readily access the vast library of clinical images that are typically used once and then stashed away (S95).

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Herb Brody

Supplements Editor

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