Next generation diagnostics for breast cancer, prostate cancer and melanoma

Published date: Feb. 1, 2012

Technology description

Summary

MARKETS ADDRESSED:
Pipeline of broad-based tumor imaging candidates and CNS imaging agents; Clinical-stage malignant melanoma imaging candidate
The spectrum of pipeline candidates will have applications across tumor imaging, with the potential to identify rapidly proliferating phenotypes via selective sigma-2 affinity. In addition, D2 and 5HT probes under development demonstrate promise for use in various neurological indications and drug discovery efforts.
The lead malignant melanoma technetium probe has been optimized and is ready to proceed to human clinical trials. The probe demonstrated high in vivo melanoma uptake (including in lung metastases), clinically-relevant sensitivity to tumor growth, and high tumor specificity. It is expected that significant logistical and cost-advantages in the clinic will be possible through use of the new probe.
Small Animal Drug Discovery Screening
In a complementary discovery, the small animal SPECT imagining system will facilitate important competitive advantages in early drug candidate screening and optimization programs, including those targeting CNS disease, osteoporosis, cancer, and rheumatoid arthritis. The potential to classify disease subpopulations may also enable valuable diagnostic-therapeutic combinations.
In addition to small molecule imaging probes, the Jones and Mahmood team have developed an advanced small animal imaging system, which leverages the multiple energy levels of SPECT to produce multiplexed, in vivo imaging for drug discovery efforts. In validating studies, tumor growth and metastases were assessed longitudinally in models of metastatic melanoma, while dual isotope imaging capabilities were used to simultaneously analyze the inflammatory process and bone erosion in mice. In the normal mouse brain, perfusion and dopamine D2 receptors were visualized concurrently using the SPECT system.

Advantages

From the labs of Professor Alun Jones (inventor of Cardiolit) and Professor Ashfaq Mahmood, comes a series of small molecule imaging probes, capable of conjugation to both SPECT-based and PET-based imaging agents. Lead candidates include sigma-1 and selective sigma-2 receptor probes in the low nanomolar sensitivity range (relevant to a wide variety of cancers, e.g., breast cancer), an advanced pre-clinical malignant melanoma diagnostic probe conjugated to technetium, and probes sensitive to D2 and 5HT receptors, characterized by favorable BBB penetration characteristics. To our knowledge, the efforts of Jones and Mahmood have produced selective sigma-2 small molecules that exceed the affinity of published results by a factor of at least 5.

Institution

Harvard University