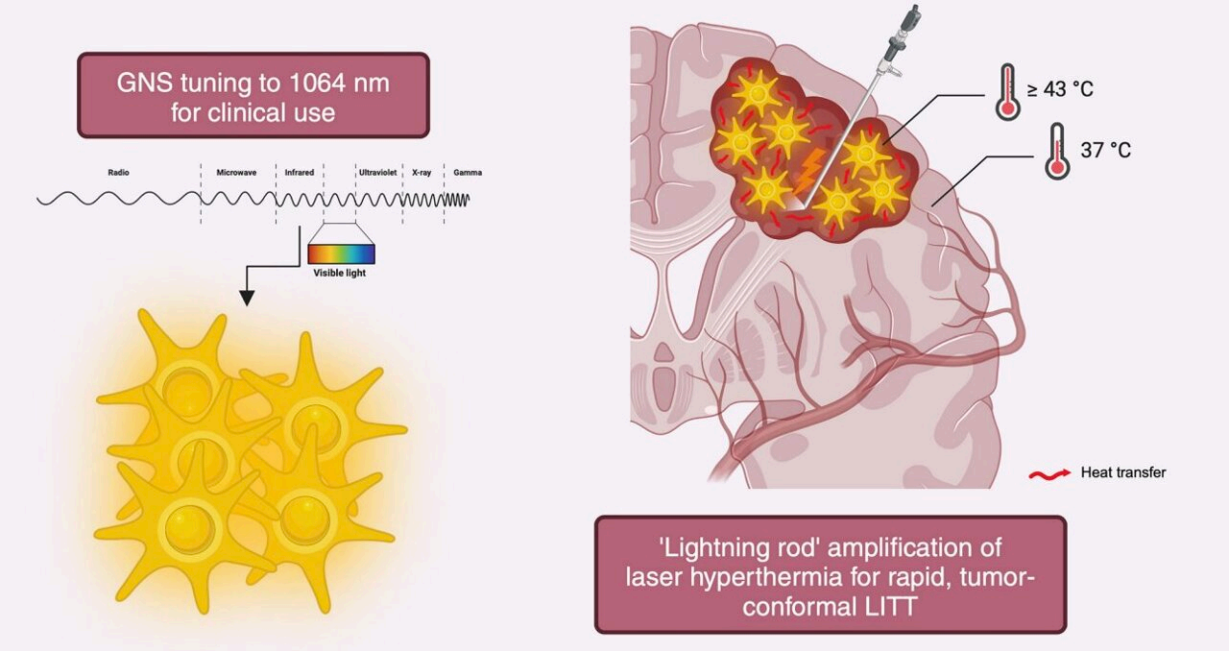
# Leveraging gold nanostars for precision laser interstitial thermal therapy

June 24 2024




Gold nanostars amplify brain-tumor selective laser interstitial thermal therapy. Credit: 2024 Haskell-Mendoza et al.

A new editorial paper titled "Leveraging gold nanostars for precision laser interstitial thermal therapy" has been published in *Oncotarget*.

In this new editorial, researchers Aden P. Haskell-Mendoza, Ethan S. Srinivasan, Tuan Vo-Dinh and Peter E. Fecci from Duke University discuss laser interstitial thermal therapy (LITT).

Over the past decade, LITT has become an important tool for the neurosurgical treatment of a variety of intracranial pathologies, including focal epilepsies, vascular malformations, and central nervous system (CNS) tumors. LITT involves the minimally invasive, stereotactically-guided placement of a laser catheter into a target lesion for subsequent thermal ablation via the delivery of infrared radiation, typically at wavelengths of 980–1,064 nm. Following transfer of the patient to a scanner, real-time magnetic resonance (MR) thermometry is employed to track tissue hyperthermal ablation.

"For patients with primary and metastatic brain tumors who are suboptimal candidates for craniotomy due to clinical status, wound healing concerns, or tumor location, LITT represents a particularly favorable option for reducing tumor burden," the researchers posit.

However, successful ablation is limited by the (1) inability to precisely sculpt heat to cover or conform to large (typically, ≥3 cm) or irregular lesions, (2) the presence of various intracranial heat sinks, including cerebrospinal fluid (CSF) spaces and blood vessels, and (3) the sensitivity of uninvolved white and gray matter structures to inadvertent thermal damage.

"To aid in the performance of more efficient, conformal, and accordingly, safe ablations, we recently developed procedures for the use of gold nanostars," the researchers explain.

**More information:** Aden P. Haskell-Mendoza et al, Leveraging gold nanostars for precision laser interstitial thermal therapy, *Oncotarget* (2024). DOI: 10.18632/oncotarget.28592

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