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标题: Advances in biomedical imaging using THz technology with applications to burn wound assessment

作者: Tewari, P (Tewari, Priyamvada); Kealey, C (Kealey, Colin); Sung, J (Sung, Jun); Maccabi, A (Maccabi, Ashkan); Bajwa, N (Bajwa, Neha); Singh, R (Singh, Rahul); Culjat, M (Culjat, Martin); Stojadinovic, A (Stojadinovic, Alexander); Grundfest, W (Grundfest, Warren); Taylor, ZD (Taylor, Zachary D.)

编者: Sadwick LP; OSullivan CM

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摘要: Terahertz (THz) hydration sensing and image has been a topic of increased interest recently due largely to improvements in source and detector technology and the identification of applications where current hydration sensing techniques are insufficient. THz medical imaging is an expanding field of research and tissue hydration plays a key role in the contrast observed in THz tissue reflectance and absorbance maps. This paper outlines the most recent results in burn and corneal imaging where hydration maps were used to assess tissue status. A 3 day study was carried out in rat models where a THz imaging system was used to assess the severity and extent of burn throughout the first day of injury and at the 24, 48, and 72 hour time points. Marked difference in tissue reflectance were observed between the partial and full thickness burns and image features were identified that may be used as diagnostic markers for burn severity. Companion histological analysis performed on tissue excised on Day 3 confirms hypothesized burn severity. The results of these preliminary animal trials suggest that THz imaging may be useful in burn wound assessment where current clinical modalities have resolution and/or sensitivity insufficient for accurate diagnostics.

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地址: [Tewari, Priyamvada; Maccabi, Ashkan; Bajwa, Neha; Singh, Rahul; Culjat, Martin; Grundfest, Warren; Taylor, Zachary D.] Univ Calif Los Angeles, Dept Bioengn, Los Angeles, CA 90095 USA

通讯作者地址: Tewari, P (通讯作者),Univ Calif Los Angeles, Dept Bioengn, 420 Westwood Plaza, Los Angeles, CA 90095 USA

电子邮件地址: zdeis@seas.ucla.edu

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