

Non-Invasive in-vivo Imaging of Mechanoreceptors in Human Skin Using Confocal Microscopy

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Technology description

This invention relates to a technique for non-invasive in vivo imaging of the sensory nerve endings in the skin or Meissner's corpuscles using confocal microscopy. Assessment of sensory nerve endings in the skin (Meissner's corpuscles) by means of invasive punch skin biopsy from the palmar surface of the hand or fingers or the sole of the feet has been done for a century as a research technique to understand sensory function and has been considered a potentially useful approach to study and diagnose sensory loss and sensory neuropathies in the clinic. However, assessment of the integrity of sensory mechanoreceptors has not found widespread application clinically as a means to assess the sensory system and sensory neuropathies, because of the invasiveness of skin biopsy from these sites, and also the variable distribution of Meissner's corpuscles, even within a single digit, that cannot be adequately assessed with a single skin biopsy. The ability to visualize and quantify sensory nerve endings in the skin quickly and non-invasively at various sites without taking a skin biopsy would make this an attractive technique both for clinical and research purposes to diagnose and follow a variety of sensory neuropathies that may preferentially affect the distal portions of sensory nerves. This would represent a major advance over techniques that require a biopsy and would have application for diagnosis and follow up of progression or responses to treatment in a wide range of conditions causing numbness or pain in the skin, including carpal tunnel syndrome, diabetic peripheral neuropathy and others.

Institution

[University of Rochester](#)

联系我们



叶先生

电话：021-65679356

手机：13414935137

邮箱：yeyingsheng@zf-ym.com