

【文献調査】

Light Propagation in NIR Spectroscopy of the Human Brain

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1 タイトル

脳の近赤外分光における光の伝播

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3 出典

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4 アブストラクト

脳の研究において、大脳皮質の酸素濃度の変化は、オキシヘモグロビンおよびデオキシヘモグロビンの濃度が血行動態の皮質神経活動への結合に起因して変化するため、非常に重要である。多くの研究では、光源と検出器の距離を伸ばすことにより、照射光が脳組織に深く浸透することを示している。本稿では、組織模倣ファントム測定、額生体内測定およびモンテカルロ (MC) シミュレーションを使用して、大脳皮質の感知を可能とする脳内の光伝播および最小の光源と検出器の距離を推定する。我々は、人間の額を模擬した多層のファントム内の異なる深さに位置する血管内の脈動する水性脂質懸濁液の光学的感知を示す。実験結果をファントムの光学特性を考慮した MC シミュレーションと比較する。異なる組織層の厚さおよび形態は、被験者の頭部の解剖学的磁気共鳴画像から得た。これら 3 つの方法の結果は互いに相関し、NIRS に基づく光学的方法で脳皮質を感知できることを示した。

5 キーワード

Brain, phantom, Monte Carlo simulations, near infrared spectroscopy

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