In Vivo Quantification of Integrin-Targeted and Protease-Activated Imaging Agents in Response to Anti-Angiogenic Therapy using Quantitative Fluorescence Tomography

**Abstract**

A novel non-peptide, integrin-targeted probe (IntegriSense) was synthesized and evaluated in a murine tumor model to assess the ability of this agent to detect tumor integrins in vivo. IntegriSense was synthesized using a non-peptide integrin-targeting moiety coupled to a near-infrared fluorophore. Tumor cells were incubated with varying concentrations of IntegriSense at 4°C for 30 min. Cells were trypsinized, and tumor cell viability was determined using MTS. Data were analyzed using GraphPad Prism software. Kd values calculated using Hill's equation. IntegriSense signal was significantly lower in tumors compared to control. This novel probe may have potential applications in imaging tumor integrins in vivo.

**In Vivo Binding**

IntegriSense and ProSense probes were injected into mice bearing tumors. The probes were imaged at different time points after injection. The probes showed a significant decrease in fluorescence signal in tumors treated with anti-angiogenic therapy. This suggests that the probe can be used to monitor changes in tumor integrin expression in response to anti-angiogenic therapy.

**Pharmacokinetic and Biodistribution Profile**

The pharmacokinetic profile of IntegriSense was evaluated in a multi-species biodistribution study. The probe showed a rapid clearance in all species tested. The half-life of the probe in all species was between 20-30 minutes. These results suggest that IntegriSense has a short circulation time and may have potential for imaging in real-time.

**Integrin-Targeted Imaging Agent**

IntegriSense is a novel non-peptide integrin-targeted probe that can be used to detect tumor integrins in vivo. The probe shows promising results in a murine tumor model and warrants further investigation for potential clinical applications.

**Integrin-Targeted Agent Specifically Detects Tumor-Associated Integrins: Quantification with FMT**

IntegriSense and ProSense probes were injected into mice bearing tumors. The probes were imaged at different time points after injection. The probes showed a significant decrease in fluorescence signal in tumors treated with anti-angiogenic therapy. This suggests that the probe can be used to monitor changes in tumor integrin expression in response to anti-angiogenic therapy.

**IntegriSense Signal Strongly Correlates with Tumor Volume**

The total amount of fluorescence (pmoles) was quantified in specific ROIs for each tumor. Co-injection with the parent compound resulted in a significant decrease in IntegriSense signal. This suggests that IntegriSense can be used to monitor changes in tumor integrin expression in response to anti-angiogenic therapy.

**Specific Binding of Integrin-Targeted Agent to Tumor Cells**

IntegriSense and ProSense probes were injected into mice bearing tumors. The probes were imaged at different time points after injection. The probes showed a significant decrease in fluorescence signal in tumors treated with anti-angiogenic therapy. This suggests that the probe can be used to monitor changes in tumor integrin expression in response to anti-angiogenic therapy.

**References**

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