InSyTe FLECT/CT Application Spotlight

Cancer Biology – CT imaging

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Title: Disruption of the EGFR-SQSTM1 interaction by a stapled peptide suppresses lung cancer via activating autophagy and inhibiting EGFR signaling
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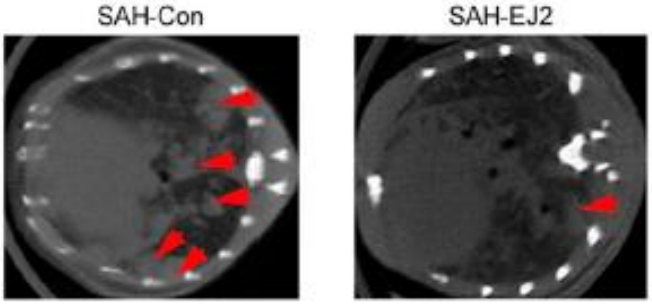
Summary: The study of cancer biology is important to further understand the biological mechanisms and pathways of cancer progression towards the goal of developing new therapeutics. Epidermal growth factor receptor (EGFR) is a well-studied receptor in cancer biology and genetic mutations that cause EGFR overexpression is found in 85-90% of all non-small cell lung cancers (NSCLC). As a result, study of the EGFR pathway is significant in the development of NSCLC treatments, particularly its interaction with other proteins. SQSTM1 is an autophagic cargo protein that binds and removes unnecessary or dysfunctional proteins, playing an important role in cell regulation and survival. When interacting with specific proteins such as EGFR, the normal functions of SQSTM1 are inhibited, leading to tumor progression. In this study, the authors investigated the SQSTM1-EGFR protein interaction and its role in NSCLC progression. The authors evaluated whether a peptide (SAH-EJ2) that disturbs the EGFR-SQSTM1 interaction would inhibit NSCLC progression. First using standard biochemical techniques to evaluate the EGFR-SQSTM1 interaction by SAH-EJ2 in vitro, the authors then performed imaging studies in animal models of NSCLC to assess the effect of SAH-EJ2 in vivo over a 2 month treatment period.



The authors used the CT subsystem of the InSyTe FLECT/CT to assess NSCLC response after treatment for 2 months with SAH-EJ2 and a control peptide (SAH-Con).

InSyTe FLECT/CT Spotlight: Using the CT system on the InSyTe FLECT/CT, the research team first identified the formation of tumors in transgenic animal models induced to form lung adenocarcinomas, then used CT to evaluate tumor response to treatment with the peptide (SAH-EJ2) or a control peptide (SAH-Con). SAH-EJ2 was administered to mice over 2x/week for a 2 month period with regular CT imaging to track tumor progression, followed by biochemical analysis of excised tumors after sacrifice. The research team was able to non-invasively visualize tumor response to treatment without requiring the use of contrast agents due to the superior soft tissue CT imaging capabilities of the InSyTe FLECT/CT.