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Title: The active compound of garlic to treat non-small cell lung cancer: in vitro studies

Mr. Yehuda 30408 Schwarz schwarz@tasmc.health.gov.il MD , Ms. Limor 30409 Kindil limorkin@mail.tau.ac.il , Mr. Amir 30410 Bar-Shai amirb@tasmc.health.gov.il , Mr. Aharon 30411 Rabinkov Aharon.Rabinkov@weizmann.ac.il and Mr. Alex 30412 Star alstar@tasmc.health.gov.il . ¹ Pulmonary Medicine, Tel-Aviv Sourasky Medical Center, Tel-Aviv, Israel, 64239 and ² Laboratory of Protein Analysis, Weizmann Institute of Science, Rehovot, Israel, 76100 .

Body: Background: Lung cancer is one of the most lethal malignancies in the Western world. The research goal of this study is to examine the capacity of a novel compound, allylmercapto-S-thiol (AMST), the derivate of Allicin (an organic sulphur compound derived from garlic) to treat the Non Small Cell Lung Cancer (NSCLC) cells. Materials and methods: Human and murine NSCLC cell lines, H1299 and 3LL, respectively, were used in the study. XTT proliferative assay was used to analyze the anti-proliferative property of AMST. In order to detect AMST influence on apoptosis, FACS analysis using Annexin V-FITC/propidium iodide was performed. Cell motility was measured by migration to artificial wound and Transwell assays. Adhesion properties were evaluated by cell attachment to glass and plastic substrates and homotypic aggregation assays. Western blot analysis was used to study the biochemical mechanisms of AMST-induced apoptosis. Results: Our results demonstrate that AMST inhibits significantly in vitro proliferation of two NSCLC cell lines and also induces apoptosis in H1299 cells. It also inhibits lung cancer cell properties consistent with in vitro metastatic phenotype including cell motility, adhesion and aggregation. Western blot analysis demonstrated correlation between AMST-induced apoptosis and inhibition of BCL-2 antiapoptotic protein in NSCLC cells. Conclusions: Our results indicate possible antitumorigenic and antimetastatic properties of novel garlic compound AMST in NSCLC cells and justifies further in vivo studies.