affinity for both U-87 MG and neoplastic tissue homogenate, demonstrating higher internalization of [131I]I-DEDEYFELV in human glioblastoma cells. Nevertheless, it is crucial to emphasize that additional in vivo investigations are necessary.

Keywords: EGFr-targeting peptide, Glioblastoma, U-87 MG cells, [131I]I-labeled-peptide.

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SYNTHESIS AND EVALUATION OF BIOACTIVE PEPTIDES FROM LAMININ-111 IN TRIPLE-NEGATIVE BREAST CANCER CELLS

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Introduction/Justification: Breast cancer stands as the neoplasm group with the highest incidence rate among women worldwide. Laminin-111 a constituent of the tissue basement membrane, is implicated in the development of breast tumors. Biologically active peptides of laminin-111 such as YIGSR and IKVAV, play crucial roles in tumor growth, metastasis, protease secretion, and angiogenesis. These peptides exert significant influence on various aspects of cancer progression, emphasizing their potential as key targets for therapeutic intervention. **Objectives:** The aim of the study was to synthesize the bioactive peptides of laminin-111 (YIKVAV and YIGSR) and assess their interactions in triple-negative breast cancer cells. **Materials and Methods:** The YIKVAV and YIGSR peptides were synthesized through solid-phase peptide synthesis using the Fmoc/tBut strategy. Subsequently, the peptides underwent a characterization and purification process employing high performance liquid chromatography (HPLC) and mass spectrometry. The MDA-MB-231 breast tumor cell line was cultured in supplemented RPMI-1640 medium at 37°C and 5% CO2 until reaching 90% confluence. The growth curve of the MDA-MB-231 cell line was conducted in sextuplicate over a 7-day period, with cell counts performed on days 1, 3, 5, and 7. To assess the effect of peptides on cell proliferation, cells were seeded at a concentration of 2×104 in 6-well plates, with the inclusion of both YIKVAV and YIGSR peptides at 50 μM (n = 6). Cell viability in the presence of YIKVAV and YIGSR was determined using the MTT assay. For this analysis, cells were plated at a concentration of 2×104, with peptide concentration of 50 μM. Spectrophotometric analyses were realized after 24 h and 7 days of incubation at 595 nm. **Results:** The YIKVAV and YIGSR peptides were efficiently synthesized, yielding approximately 80% for both. Chromatographic analyzes conducted by HPLC and mass spectrometry confirmed the efficiency of the entire synthesis, cleavage, and characterization process of the peptides by the presence of only a single peak corresponding to the synthesized peptides. The growth curve profile determination of MDA-MB-231 cell line revealed exponential growth between days 5 and 7 of cell culture. The results indicate that the YIGSR peptide significantly inhibited cell growth by approximately 45%, whereas the YIKVAV fragment promoted cell growth by approximately 38% and ($p < 0.0001$) on the seventh day of cell culture. Regarding the MTT analysis after 24 h, no significant differences were observed between the control and treated groups for both fragments, suggesting that the peptides exhibited no toxicity at concentration of 50 μM. Additionally, on the 6th day, a reduction in tumor cell viability was observed for the YIGSR fragment, while an increase in viability was noted for YIKVAV ($p < 0.0001$). **Conclusion:** The YIKVAV and YIGSR peptides were effectively synthesized, characterized, and purified. The YIKVAV peptide, at a concentration of 50μM, promoted cell growth, while the YIGSR peptide significantly hindered the growth of the MDA-MB-231 cell line. This observation is consistent with the findings of cell viability assays conducted using MTT. This study holds significance for enhancing our comprehension of peptide actions in their interaction with triple-negative breast cancer cells, with the ultimate aim of proposing more effective targets for treatment.

Keywords: Breast cancer, Laminin-111-peptides, MDA-MB-231 cells.

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ASSESSMENT OF IN VITRO INTERACTIONS BETWEEN RADIOLABELED EGFR-TARGETING PEPTIDE INHIBITORS AND GLIOBLASTOMA CELLS

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Introduction/Justification: Peptides are implicated in various physiological responses and hold significant potential as targeting molecules, especially in cancer diagnosis or treatment. Radiolabeled peptides have been investigated for their potential as theranostic agents, holding considerable promise for precisely targeting tumorigenic cells. Previous studies indicate that biologically active peptides exhibit a high affinity for the Epidermal Growth Factor receptor (EGFr), which is overexpressed in various tumor cells, including glioblastoma, the most prevalent and aggressive malignant brain tumor. **Objectives:** To evaluate the in vitro interactions involving two radiolabeled peptide inhibitors targeting the EGFr overexpressed in glioblastoma cells. **Materials and Methods:** Two EGFr-targeting peptide inhibitors, anti-EGFr-LP and anti-EGFr-LG, were radiolabeled with [131I]NaI (11.1–14.8 MBq) using

the chloramine T method (room temperature; reaction time = 120 s). The radiochemical yield (RCY) (n = 8) and stability (n = 3) were evaluated using ascending chromatography on TLC-SG strips and acetonitrile/water (95:5) as eluent. C6 and U-87 MG glioblastoma cell lines were cultured in supplemented DMEM medium (5% CO2 atmosphere; 37°C) until reaching ~85% confluence. Subsequently, aliquots of 2 x 10^6 C6 or U-87 MG cells were incubated with each radiopeptide (37°C) under agitation (500 rpm). In vitro binding and internalization percentages were assessed at 1 and 3 h post-incubation (n = 6). Data were expressed as 'mean ± standard deviation' and the statistical analysis was performed using GraphPad Prism software. **Results:** The RCY of [131I]I-anti-EGFr-LP and [131I]I-anti-EGFr-LG were 92.92 ± 3.42 and 97.80 ± 1.08, respectively. Both 131I-labeled peptides were radiochemically stable over 24 h. The in vitro interaction between C6 cells and [131I]I-anti-EGFr-LP showed binding percentages of 4.80 ± 0.37% (1 h) and 5.87±1.21% (3 h), with no statistically significant difference ($p = 0.1519$). The internalization percentages, within the bound fractions, increased from 64.45 ± 4.19% (1 h) to 75.15±1.60% (3 h) ($p < 0.0001$). For the [131I]I-anti-EGFr-LG, the data were of the same order of magnitude. The binding percentages increased from 3.95±0.33% (1 h) to 6.03 ± 0.66 (3 h) ($p < 0.0001$) and the internalization percentages, among the bound fractions, were 62.57±5.53% (1 h) and 64.04±3.21% (3 h), with no statistically significant difference ($p = 0.5959$). The in vitro interaction between U-87 MG cells and [131I]I-anti-EGFr-LP showed an increment of the binding percentages from 6.50 ± 0.93% (1 h) to 8.03 ± 0.29% (3 h) ($p < 0.0001$), but the internalization percentages, within the bound fractions, showed no statistically significant difference ($p = 0.2791$), 68.98 ± 2.23% (1 h) and 73.02±6.57% (3 h). For the [131I]I-anti-EGFr-LG, the binding percentages were 10.97±1.48 (1 h) and 11.28 ± 0.84 (3 h), with no statistically significant difference ($p > 0.6724$). The internalization percentages, among the bound fractions, were also statistically similar ($p > 0.3596$), 68.21 ± 0.16% (1 h) and 65.36 ± 3.56 (3 h). **Conclusion:** The in vitro interaction data revealed high affinity of [131I]I-anti-EGFr-LP and [131I]I-anti-EGFr-LG for the C6 and U-87 MG glioblastoma cell lines, which are known to overexpress EGFr. These preliminary findings support the potential use of these peptide inhibitors as specific peptide-based targeting molecules for EGFr, with potential applications as theranostic agents.

Keywords: EGFr-targeting peptide inhibitors, Glioblastoma cells, In vitro interactions, Radiolabeled peptides.

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SKELETAL MUSCLE RADIODENSITY AND INSULIN SENSITIVITY IN PATIENTS WITH RECTAL CANCER

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Introduction/Justification: The assessment of skeletal muscle attenuation via computed tomography plays a crucial role in identifying myosteatosis among cancer patients. Myosteatosis, characterized by ectopic adipose tissue infiltration in skeletal muscles, has been linked to poor prognosis in various cancers. However, its implications specifically in rectal cancer remain uncertain. Studies have shown that myosteatosis correlates with increased insulin resistance, highlighting the need for further investigation in clinical settings. **Objectives:** This study aimed to investigate the relationship between insulin sensitivity and skeletal muscle radiodensity in patients recently diagnosed with rectal cancer. **Materials and Methods:** A cross-sectional study design was employed, inviting patients diagnosed with rectal cancer to participate. Insulin sensitivity was assessed using the M-value obtained from euglycemic hyperinsulinemic clamp tests. Skeletal muscle analysis was conducted using computed tomography (CT) images of the third lumbar vertebra processed with SliceOmatic software. Skeletal muscle was defined within the attenuation range of -29 to +150 Hounsfield Units (HU), while intermuscular adipose tissue was defined within -190 to -30 HU. The mean skeletal muscle radiodensity (SMR) was reported. Demographic and clinical data were collected from medical records. Statistical analyses were performed using Stata Corp LP® version 17.0 software. The study protocol received approval from the Institutional Review Board (CAAE: 91217418.2.0000.5404). **Results:** The analysis included a total of 33 patients, predominantly male (67%) with ages ranging from 55 to 70 years (58%). Patients across stages I to IV were represented, with 48% in stage III, 11% in stage I, 11% in stage II, and 30% in stage IV. Overweight and obesity were diagnosed in 37.5% and 30% of the sample, respectively. Common comorbidities included diabetes (21%), hypertension (60%), and dyslipidemia (21%). The M-value adjusted for Total Body Weight (TBW) demonstrated a significant association with Skeletal Muscle Radiodensity ($rho = 0.3926$, $p = 0.0269$), whereas no statistical difference was observed when adjusting for Free Fat Mass (FFM) ($p = 0.1769$). **Conclusion:** In conclusion, our findings suggest a moderate positive association between insulin sensitivity and skeletal muscle radiodensity in rectal cancer patients.

Keywords: Insulin sensitivity, Rectal cancer, Skeletal muscle radiodensit.

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PROGNOSTIC EVALUATION OF THE NUTRITIONAL PROGNOSTIC INDEX IN PATIENTS WITH NON-METASTATIC RECTAL CANCER

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