loss in viability after the inhibition. In all cases the inhibition was accentuated by the exposure of the treated cells to Doxorubicin, the loss in viability being higher than the Doxorubicin control.

Conclusion: Based on the results, one inhibitor was selected for further experiments, using $^{64}CuCl_2$ as the main DSB inducer. The implementation of DNA-PK inhibitors into medical practice can enable the stratification of oncologic patients into two categories, based on the tumors' vulnerability to NHEJ disruptions. Thus, the therapeutic pathways of patients with NHEJ tumors could branch, combining traditional genotoxic therapies (radiation and DNA-damaging chemotherapeutics) with DNA-PK inhibitors to achieve an enhanced effect and improved survival outcomes.

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GALLIUM-68 RADIOLABELLED PD-L1 BINDING PEPTIDE WL12 FOR LUNG CANCER

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Aims: Lung cancer is one of the most common cancers worldwide and has a high mortality rate. Clinically, both invasive and non-invasive imaging methods for lung cancer are insufficient for early detection, leading to high mortality rates (1,2). WL12, a targeting peptide, is a cyclic peptide consisting of 14 amino acids. It selectively binds to PD-L1, an immune point protein overexpressed in many cancer cell lines (3,4). In this study, WL12, a PD-L1 specific peptide to be used in the diagnosis of lung cancer, were labelled with ^{68}Ga and the optimum labelled conditions were investigated.

Methods: 700 µg of WL12 was dissolved in 250 µL of dimethylformamide (DMF) and reacted with 970 µg of DOTAGA anhydride in the presence of 0.30 µL diisopropylethylamine (DIPEA). The reaction mixture was stirred overnight at room temperature. After incubation, DMF and DIPEA were evaporated under reduced pressure, and the residue was reconstituted in a water:acetonitrile mixture. The WL12-DOTAGA conjugate was characterized by HPLC and MALDI-TOF mass spectrometry. HPLC analysis was performed using a C18 column (5 µm, 4.6 × 250 mm) with a mobile phase consisting of (A) methanol containing 0.1% TFA and (B) water containing 0.1% TFA. A linear gradient from 2/98 to 100/0 (A/B) was applied over 60 min at a flow rate of 4 mL·min^{-1}. The purified WL12-DOTAGA conjugate was radiolabelled with ^{68}Ga (~2 mCi) under various conditions to determine optimal labelling parameters.

Results: WL12-DOTAGA conjugate was successfully synthesized with a yield exceeding 98% (Figure 1). MALDI-TOF mass spectrometry confirmed the molecular weight with an observed m/z of 2340.084 (expected: 2340.65) (Figure 2). Optimization studies demonstrated that buffer composition, pH, incubation temperature, and reaction time significantly influenced radiolabeling efficiency. Under optimized conditions, WL12-DOTAGA was radiolabeled with ^{68}Ga, achieving a radiochemical purity (RCP) greater than 90% (Figure 3). In vitro and in vivo evaluations are currently ongoing using the optimized formulation.

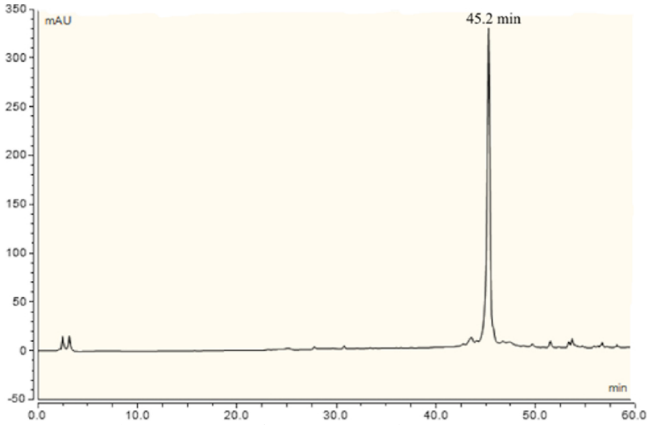

Figure 1. HPLC chromatogram of WL12-DOTAGA.

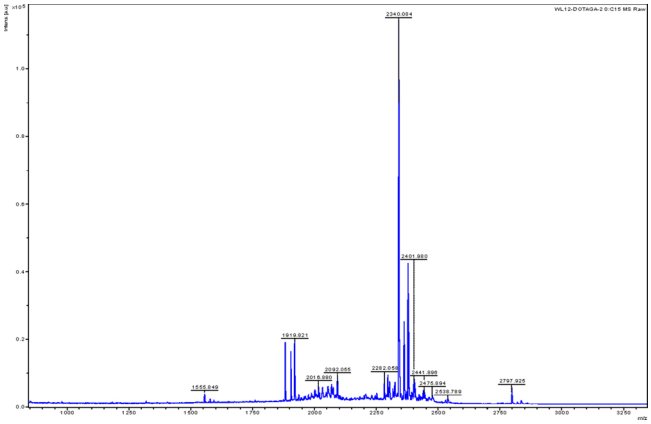

Figure 2. MALDI-TOF mass analysis of WL12-DOTAGA.

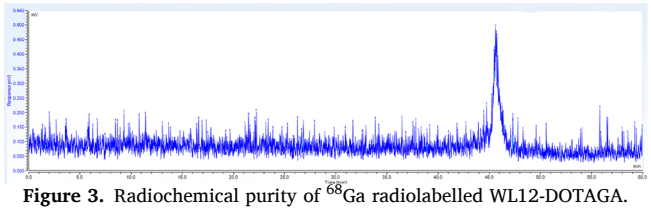

Figure 3. Radiochemical purity of ^{68}Ga radiolabelled WL12-DOTAGA.

Conclusion: The successful synthesis and high-yield ^{68}Ga radiolabeling of WL12-DOTAGA highlight its potential as a promising peptide-based radiopharmaceutical. Ongoing biological evaluations will further clarify its suitability for molecular imaging applications.

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STABILITY ASSESSMENT OF 99MTC-SESTAMIBI UNDER VARIOUS STORAGE CONDITIONS

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Aims: Radiopharmaceutical CardioSpect is a technetium(^{99m}Tc) -based agent used to assess myocardial perfusion in nuclear medicine. The aim of this experimental study was to evaluate the impact of selected storage-related factors on the radiochemical purity (RCP) and stability of ^{99m}Tc-SESTAMIBI (CardioSpect®). Radiochemical purity analysis were performed by thin-layer chromatography (TLC) and an extraction-based method.

Methods: Technetium(^{99m}Tc)tetrakis (2-methoxyisobutyl isocyanide) copper (I) tetrafluoroborate (^{99m}Tc-SESTAMIBI) was prepared according to the methods described in the package insert included with the commercial kits. Freshly eluted sterile sodium (^{99m}Tc) pertechnetate solution was added to the comercially available CardioSpect kit (Medi-Radiopharma Kft., Érd, Hungary). ^{99m}Tc-pertechnetate was obtained daily from a $^{99}Mo/^{99m}Tc$ UltraTechneKow FM generator (Curium Netherlands B.V., Petten).

Samples of prepared CardioSpect were stored under four predefined conditions: