Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

mice and high-performance liquid chromatography (HPLC) analysis of plasma samples. Feasibility of [18F]AlF-NOTA-DCM to detect inflammation was evaluated in a Complete Freund's Adjuvant-induced mouse model of lymph node and foot pad inflammation.

Results: The flow cytometry showed that M2 macrophages expressing MMR clearly took up Alexa488-DCM, whereas M1 macrophages lacking MMR did not show uptake (Fig. 1b). [18F]AlF-NOTA-DCM (25 kDa, Fig. 1a) was synthesized with >99% radiochemical purity and stability shelf life of 4 hours. Tracer was highly stable in mouse blood circulation (at 10 min post-injection 90%±6 of plasma radioactivity was from intact tracer). *In vitro* blocking study with excess of unlabeled DCM on inflamed lymph node tissue section confirmed that [18F]AlF-NOTA-DCM binding was specific to CD206+ macrophages. With 18F-FDG as reference, PET/CT revealed that [18F]AlF-NOTA-DCM visualized the inflamed foci (TBR 9.60±4.02) with a rapid blood clearance and the highest radioactivity concentration in liver, spleen and bone marrow, respectively. H&E and CD206 staining confirmed the uptake in inflamed area.

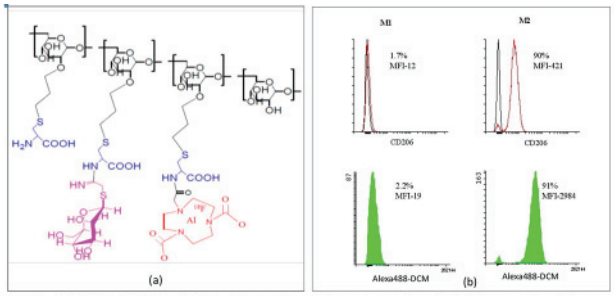

Figure 1. **ALEXA488-DCM uptake by Macrophage Mannose receptor (CD206) expressing M2 macrophages derived from human blood monocytes.** (a) DCM structure (25kDa), consist of dextran backbone (black), cysteine (blue), mannose moiety (pink) and [18F]AlF attached to NOTA chelator. (b) Representative flow cytometric analyses of CD206 and Alexa488-DCM uptake from M1 and M2 macrophages. (Black histograms: isotype controls; red histograms: CD206; green filled histograms: Alexa488-DCM uptake; MFI = mean fluorescence intensity).

Conclusion: A new macrophage mannose receptor-targeted radiotracer [18F]AlF-NOTA-DCM was successfully developed and showed promising results in preclinical studies to detect inflammation. Further studies in inflammation models are warranted.

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P-022
Immune mediated inflammation and perfusion in lungs of Covid-19 patients studied with [11C]GW457427 and [15O]water: a first-in-man pilot study

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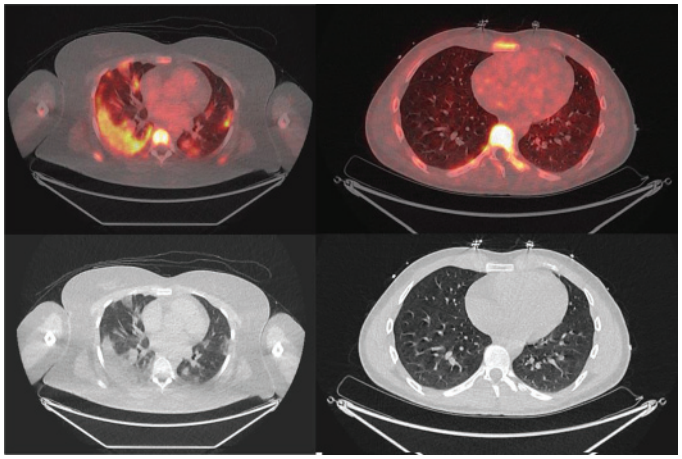
Objectives: The aim of an ongoing First-In-Man phase 0 clinical study is evaluation of a novel radiopharmaceutical, [11C]GW457427 ([11C]NES), targeting neutrophil elastase (NE) for early detection of immune mediated inflammation using positron emission tomography (PET). This technology would provide a fast and sensitive tool for disease and treatment response monitoring as well as accelerate drug development of new anti-inflammatory therapies. In this pilot report, we describe an automated GMP compliant method for [11C]NES production and its use in Covid-19 patients and healthy controls. Lung perfusion was determined with [15O]water.

Methods: Five subject; four Covid-19 patients with ongoing disease and two controls, were investigated with a 10 min dynamic [15O]water PET-CT scan followed by a 90 min dynamic and a 20 min static whole-body PET-CT scans with [11C]NES using a Discovery MI PET/CT scanner (25 cm FOV) with lungs in FOV.

Results: [11C]NES was obtained with a radiochemical purity higher than 98% and a molar activity in the range of 180-328 GBq/µmol. A typical production gave 5-7 GBq of [11C]NES. In all Covid-19 patients [11C]NES accumulated in the same areas of the lung with the characteristic ground-glass opacities found in Covid-19 patients identified by CT and low perfusion as measured with[15O]water. The very low non-specific signal of [11C]NES in non-target areas resulting in a high target-to-background ratio. No accumulation of [11C]NES in the lungs was found in the healthy control. PET and CT images: left [11C]NES in a Covid-19 patient, right healthy control.



Conclusion: The production method for [11C]NES was GMP-validated for human use. The PET-CT results can be interpreted as a neutrophil mediated pulmonary inflammation affecting the lung function partly explaining the severe late-stage conditions of the Covid-19 patients. Lung perfusion measurements suggest that hypoxic vasoconstriction in areas with ongoing inflammation and the resulting hyperperfusion of unaffected areas of the lungs leads to low blood oxygenation, potentially by a shunt mechanism. This pilot study shows that [11C]NES could be a generally useful PET-tracer for the study of in vivo immune mediated inflammation. We are currently investigating other patient categories with inflammatory diseases.

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P-023
In vitro evaluation of 18F-fluorinated D-methionine and D-tyrosine derivatives as potential radiotracers for PET imaging of bacterial infection

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Objectives: Infection arising from surgery is a major clinical challenge. Complications resulting from procedures such as vascular grafts and joint replacements can be difficult to diagnose, because