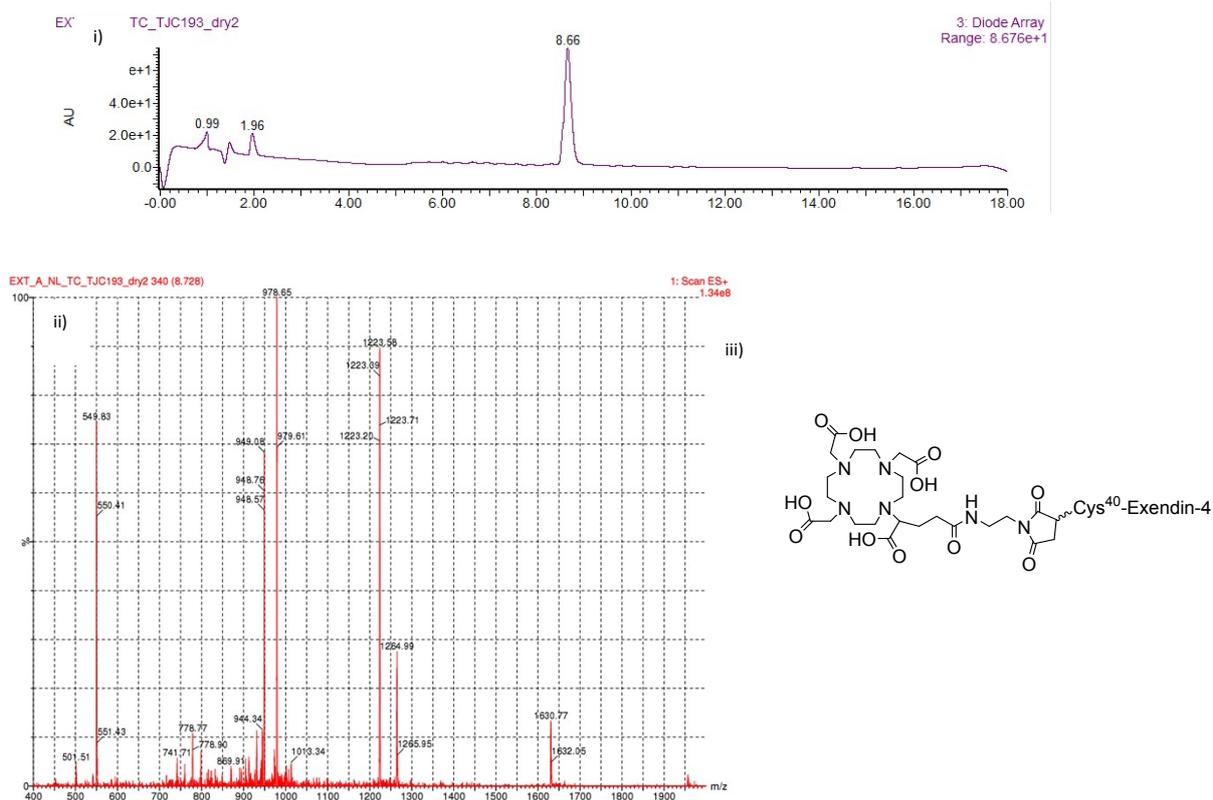
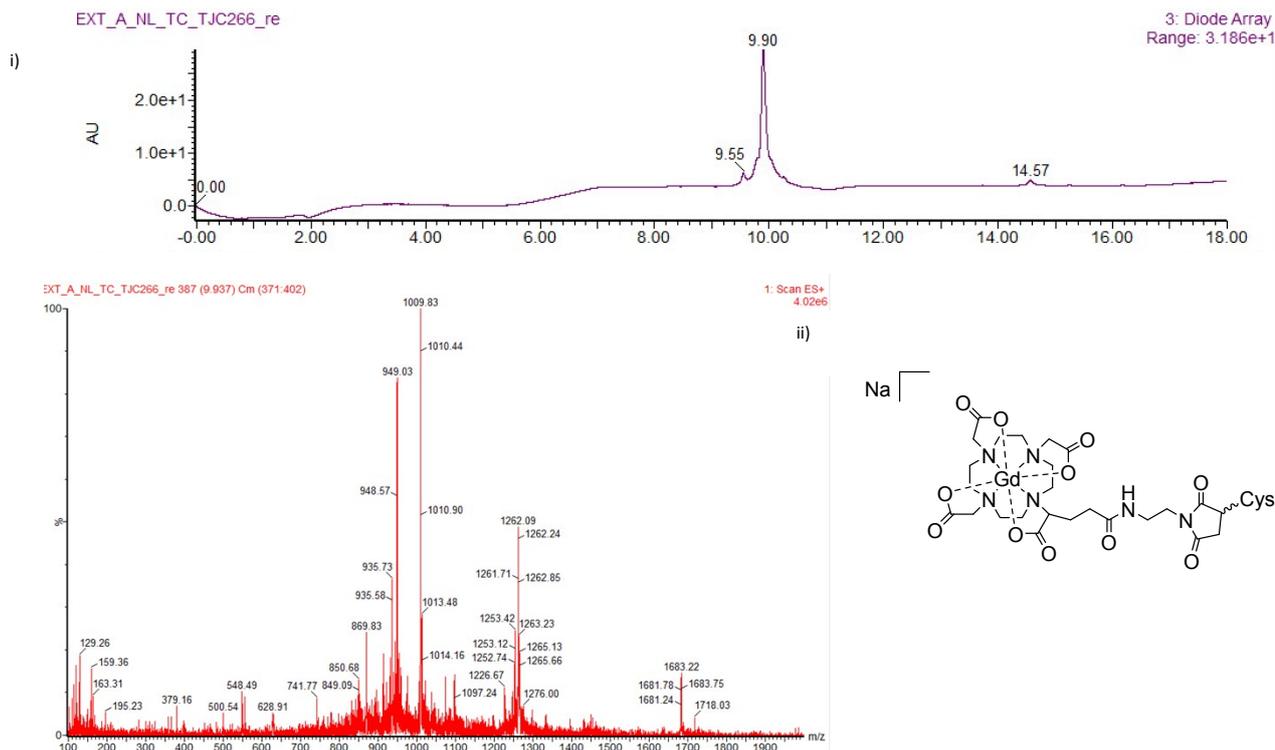


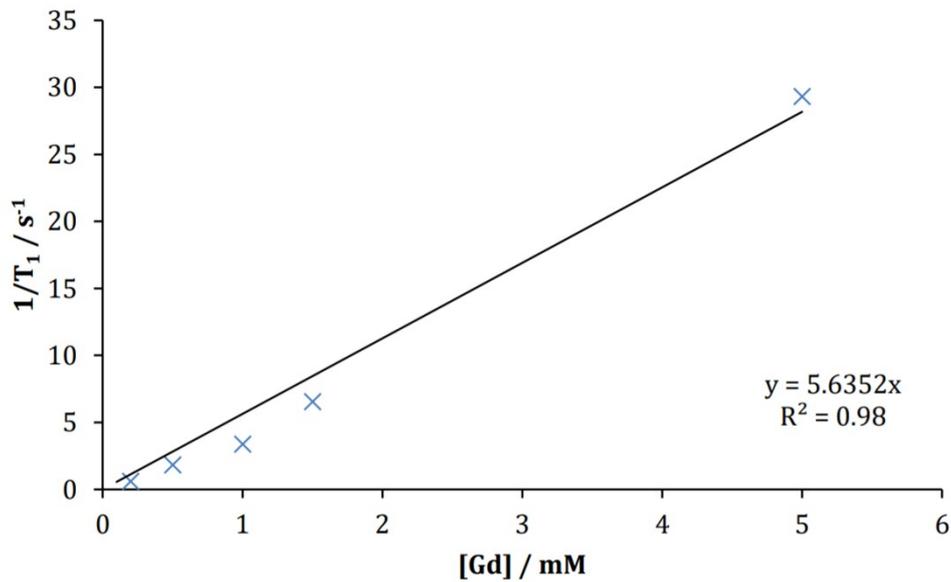
Supplementary Figure 1: β -cell-specific deletion of DICER (β Dicer-null) leads to hyperglycaemia. Glycemia after MRI in β Dicer-null (green) and littermate controls (β Dicer-ctrl, red). N = 4/genotype. Each dot represents a single mouse. **** $p < 0.0001$, Student's t test.



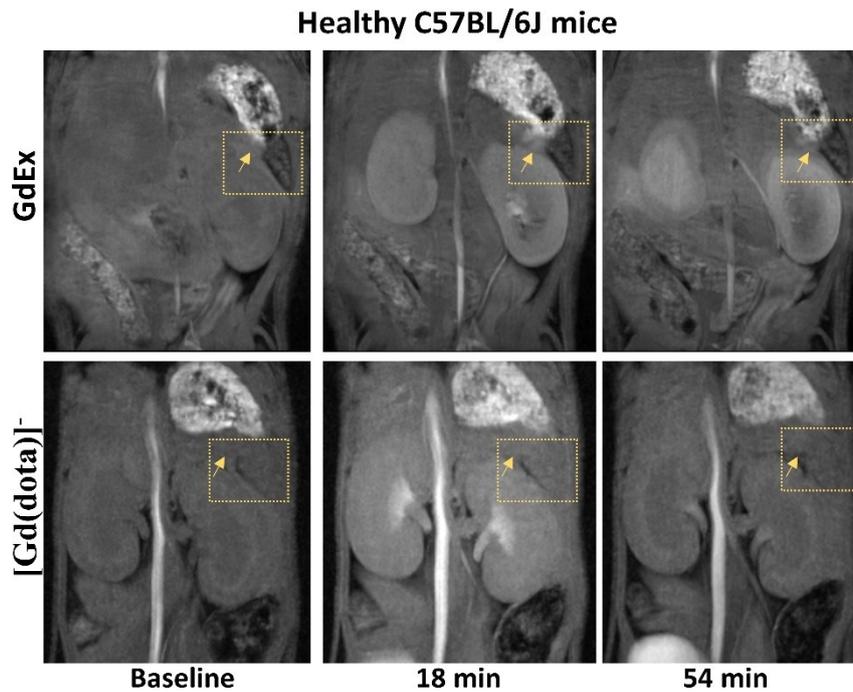
Supplementary Figure 2: Characterisation data (i) LCMS UV absorption trace (5% MeCN/95% H₂O to 95% MeCN/5% H₂O), (ii) MS of the peak with retention time of 8.66 minutes showing the [M]³⁺, [M]⁴⁺ and [M]⁵⁺ peaks at $m/z = 1630.99$, 1223.58 and 978.65 respectively) and (iii) structure of the free ligand, compound 1.



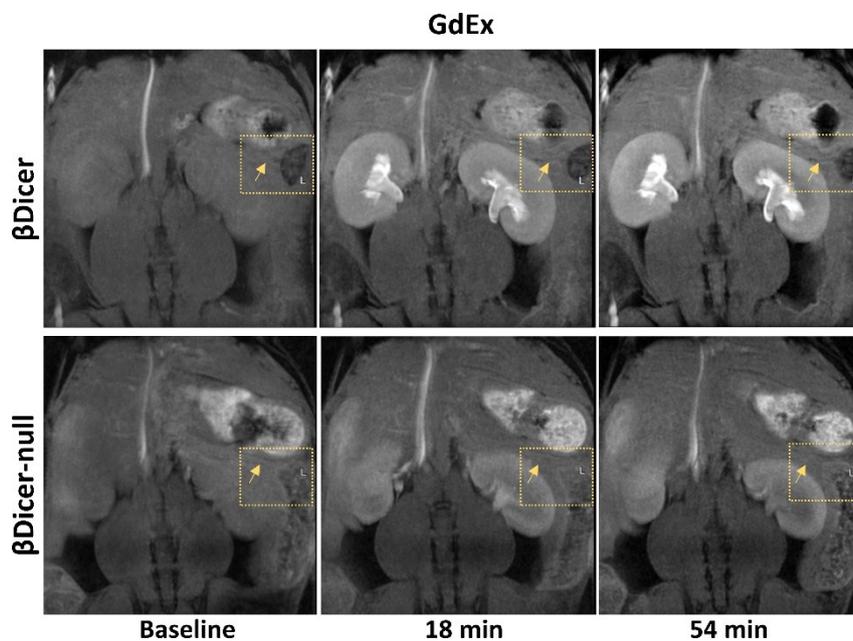
Supplementary Figure 3: Characterisation data (i) LCMS UV absorption trace (5% MeCN/95% H₂O to 95% MeCN/5% H₂O), (ii) MS of the peak with retention time of 9.90 minutes showing the [M]³⁺, [M]⁴⁺ and [M]⁵⁺ peaks at $m/z = 1683.22$, 1262.09 and 1009.83 respectively) and (iii) structure of **GdEx**.



Supplementary Figure 4: Plot of $1/T_1$ against concentration of gadolinium, [Gd] which was used to calculate the relaxivity of **GdEx**.



Supplementary Figure 5: Representative abdominal MRI of healthy C57BL/6J mouse before (baseline), 18 min. and 54 min. after **GdEx** (upper panel) and $[Gd(dota)]^-$ (lower panel) injection. The yellow square highlights the location of the pancreas and spleen. Note the increased contrast of the pancreas relative to the baseline linked to **GdEx** binding to the β -cell GLP-1R receptors *via* the exendin-4 moiety (yellow arrow). After $[Gd(dota)]^-$ injection, the pancreas exhibits a low contrast accumulation, followed by rapid overall clearance from most tissues (pancreas, liver, spleen) suggested by the increased contrast in the bladder at later time points.



Supplementary Figure 6: Representative abdominal MRI of β Dicer-control and β Dicer-null mice before (baseline), 18 min. and 54 min. after **GdEx** injection. The T_1 contrast in the pancreas of β Dicer-null mice is weaker compared to the β Dicer-control mice (yellow arrow). The yellow square highlights the location of the pancreas and spleen.