Supporting information for

Scaling-down Antibody Radiolabeling Reactions with Zirconium-89

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Supplemental Methods

Zr-89 Production

Zirconium-89 was produced via the methods of Dabkowski et al.[1] and purified via the methods of Walther et al.[2] We developed a remote handling rig from an Eckert & Ziegler 6 valve dispensing cassette and syringes to allow us to carry out all steps of the Y-89 target dissolution and Zr-89 purification without radiation exposure. This also allowed us to apply compressed air pressure to the Zr-89 separation column to considerably decrease elution times without reducing separation efficiencies. In our hands, we found it most effective to elute the Zr-89 in 3 × 1 mL fractions of 1 M oxalic acid with the middle fraction routinely containing 1 GBq of purified Zr-89 in 76% yield. (90% recovery is achieved when summing all 3 fractions).

Supplemental Figures

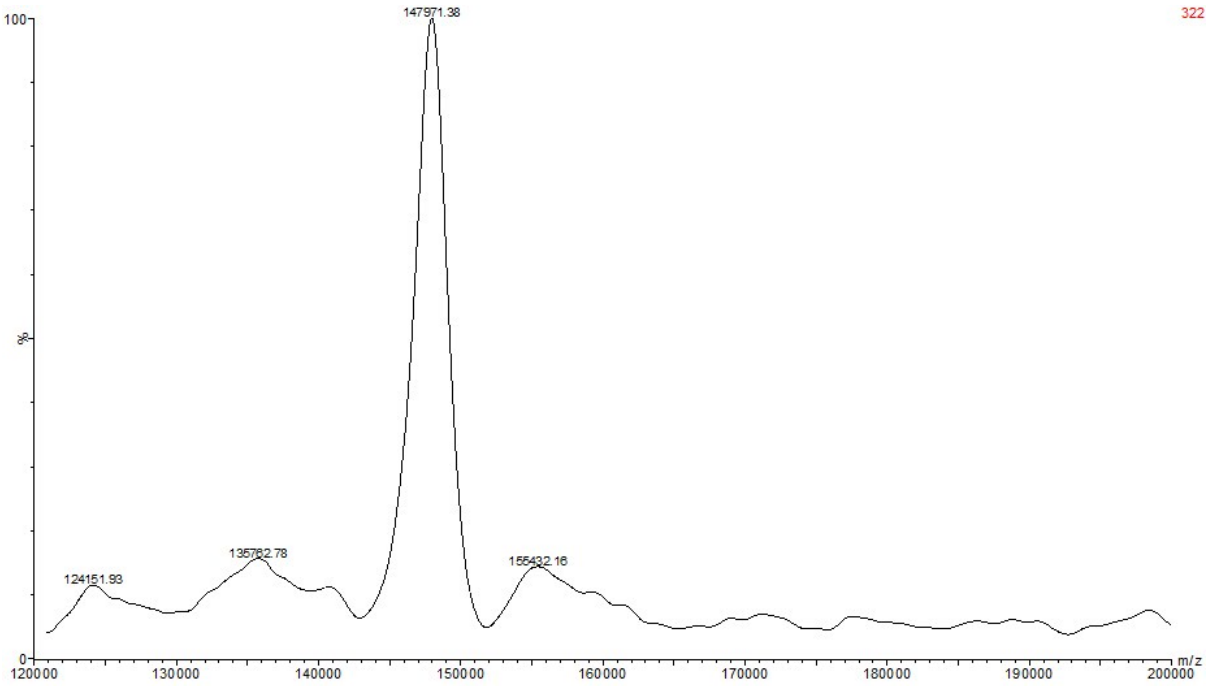

Figure S1. Representative MALDI-TOF MS spectrum of unmodified tocilizumab

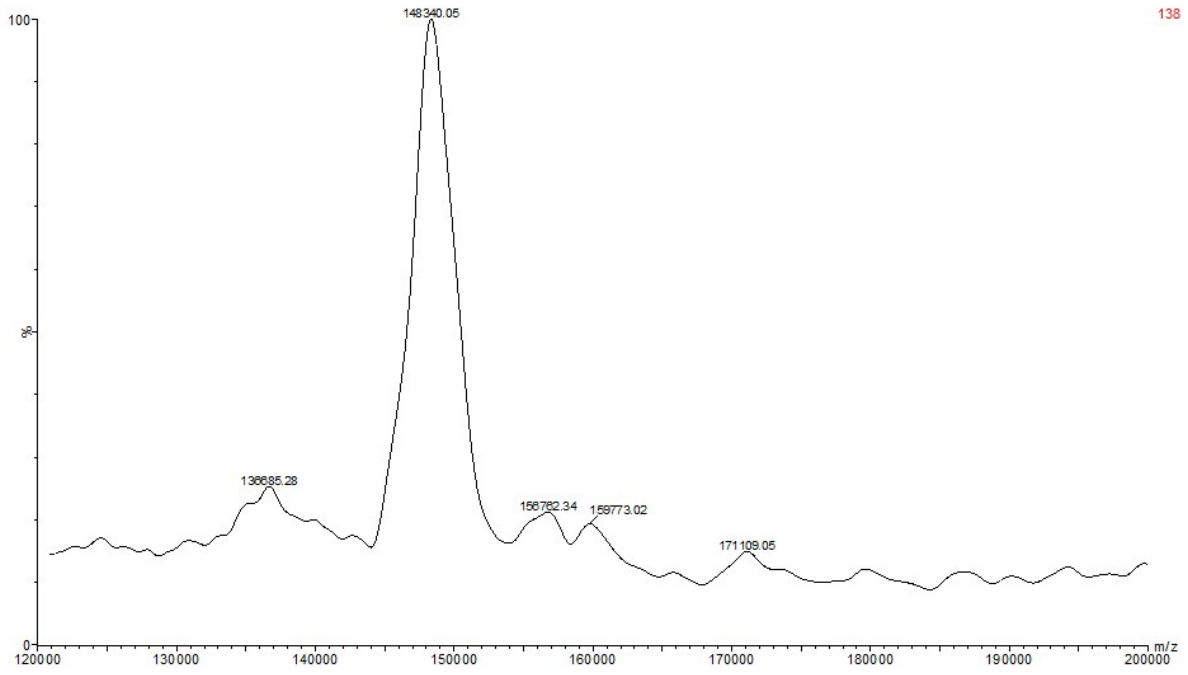

Figure S2. Representative MALDI-TOF MS spectrum of DFO-modified tocilizumab

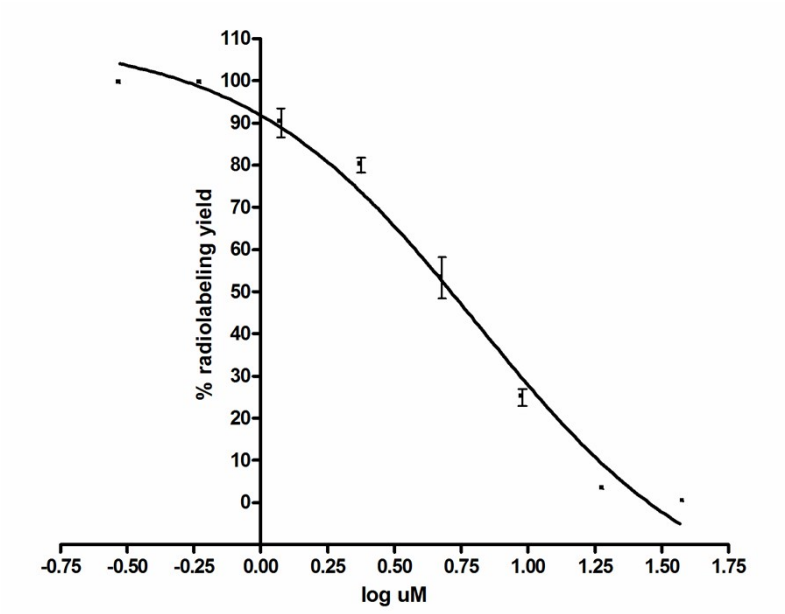

Figure S3. Isotopic dilution experiments to determine the efficiency of antibody modification by p-SCN-Bn-DFO

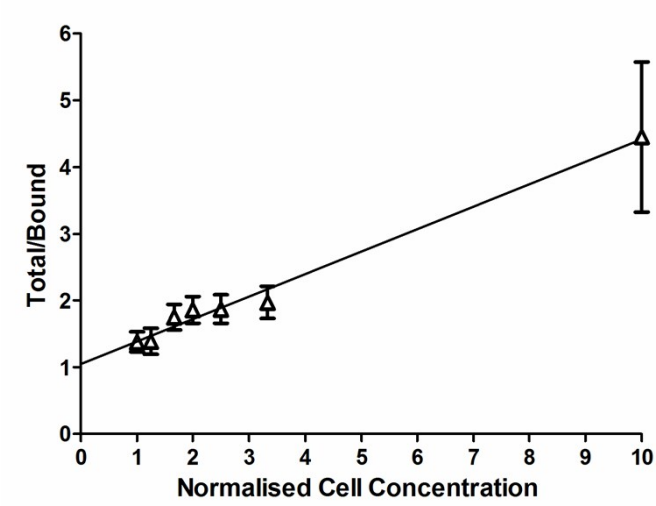

Figure S4. Determination of immunoreactive fraction of ^{89}Zr-trastuzumab on MDA-MB-231/H2N cells by linear extrapolation to conditions representing an infinite antigen excess

References

1. A. M. Dabkowski , S. J. Paisey, M. Talboys, C. Marshall, *Acta Phys. Pol.,* 2015, **127**, 1479-1482.

2. M. Walther, P. Gebhardt, P. Grosse-Gehling, L. Würbach, I. Irmler, S. Preusche, M. Khalid, T. Opfermann, T. Kamradt, J. Steinbach, H.-P. Saluz, *Appl. Radiat. Isot.,* 2011, **69**, 852-857.