Supplementary Information

Figure S1. Biacore analysis to determine the concentration of anti-ricin Ab in polyclonal Fab/F(ab')2 preparations. Serial dilutions of Ab or fragments (30–250 nM, based on total protein concentration) were captured on a ricin-coated sensor chip under mass transport limited conditions (flow rate 5 µL/min) or non-mass transport limited (100 µL/min) conditions. Concentration of anti-ricin Ab or fragment was determined according to the following calculations [21].

The concentration of the analyte \([\text{Ab}_{\text{bulk}}]\) is calculated by the following equation:

\[
[\text{Ab}_{\text{bulk}}] = \frac{1}{L_m} \left( \frac{1}{L_{m1}} - \frac{1}{L_{m2}} \right)
\]

\[MW \cdot G \cdot \left( \frac{1}{\frac{dR_1}{dt_1}} - \frac{1}{\frac{dR_2}{dt_2}} \right)\]

- \(L_m\) = mass transport coefficient
- \(MW\) = 100,000g/mole for F(AB')2
- \(G\) = 100,000RU mm2/ng = 1x10^6 RU m2/g
- \(\frac{dR}{dt}\) = linear slope (measured within the first ~36s of binding where \(k_d\) is negligible) of 2 curves
  1. Mass transport limited (flow 5 µL/min) \(\text{flw}_5 = 8.33 \times 10^{-11} \text{ m}^3/\text{s}\)
  2. Non mass transport (flow 100 µL/min) \(\text{flw}_{100} = 1.67 \times 10^{-9} \text{ m}^3/\text{s}\)

\(L_m\) in m/s is calculated as follows:

\[L_m = \left( \frac{\sqrt{D^2 \cdot \text{flw}}}{h \cdot w \cdot l} \right)^{\frac{3}{2}}\]

- \(h\) = height of the flow cell = 1.8 x 10^-5 m
- \(w\) = width of the flow cell = 5 x 10^-4 m
- \(l\) = length of the flow cell = 1.6 x 10^-3 m

\(D\) the diffusion coefficient for F(AB')2 at 37°C calculated as follows:

\[D = \frac{1.0 \times 10^{-11} \cdot 324.3 \cdot MW^{-\frac{1}{3}} \cdot C_{37}}{f / f_0 \cdot \frac{v}{v_0}}\]

- \(f / f_0\) = friction factor = 1.2
- \(v / v_0\) = solution viscosity = 0.89
- \(C_{37}\) = conversion to 37°C = 1.06