Electronic Supplementary Information for

Effects of adsorption onto silica sand particles on the hydrolysis of tetracycline antibiotics

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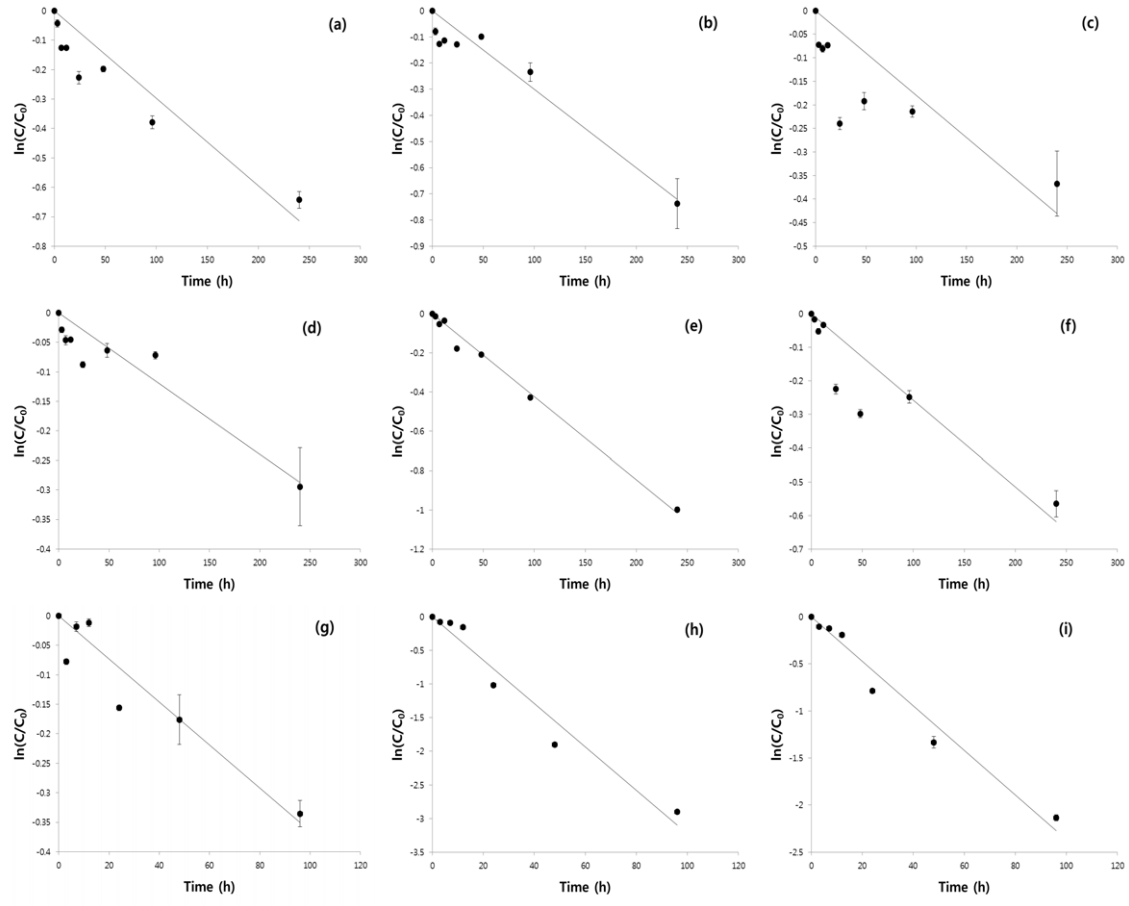
Figure ESI2. Changes in the relative electrical conductivity of the effluent with increasing pore volume of 50 mg L^{-1} NaCl solution. The volumetric flow rate was 1 mL min^{-1}. The line represents the best-fit using equation 3 without degradation and adsorption.

Figure ESI3. Changes in the relative concentration (C/C_0) of three tetracyclines in the column effluent at four different volumetric flow rates. (a: TC, 3.0 mL h^{-1}, b: TC, 0.6 mL h^{-1}, c: TC, 0.2 mL h^{-1}, d: TC, 0.08 mL h^{-1}, e: OTC, 3.0 mL h^{-1}, f: OTC, 0.6 mL h^{-1}, g: OTC, 0.2 mL h^{-1}, h: OTC, 0.08 mL h^{-1}, i: CTC, 3.0 mL h^{-1}, j: CTC, 0.6 mL h^{-1}, k: CTC, 0.2 mL h^{-1}) Short-dashed lines indicate the expected break-through curve for a tracer (Cl^-). Short-dashed and solid lines represent the modeled break-through curve by fitting only the retardation factor and both the retardation factor and the degradation rate constant in equation 3, respectively. Long-dashed lines indicate a theoretical break-through curve for a tracer.

Figure ESI4. The major transformation pathways of tetracyclines. Tetracycline and it transformation products: R5 = H, R7 = H; oxitetracycline and its transformation products: R5 = OH, R7 = H; chlortetracycline and its transformation products: R5 = H, R7 = Cl.

Figure ESI5. Bioluminescence inhibition of the three tetracycline effluents (flow rate = 0.08 mL h^{-1}) in Vibrio fischeri. Filled and open circles represent the column influents and the effluents, respectively. Solids lines and dashed lines are best-fit sigmoidal curves for the determination of ED_{50} for the influents and effluents.



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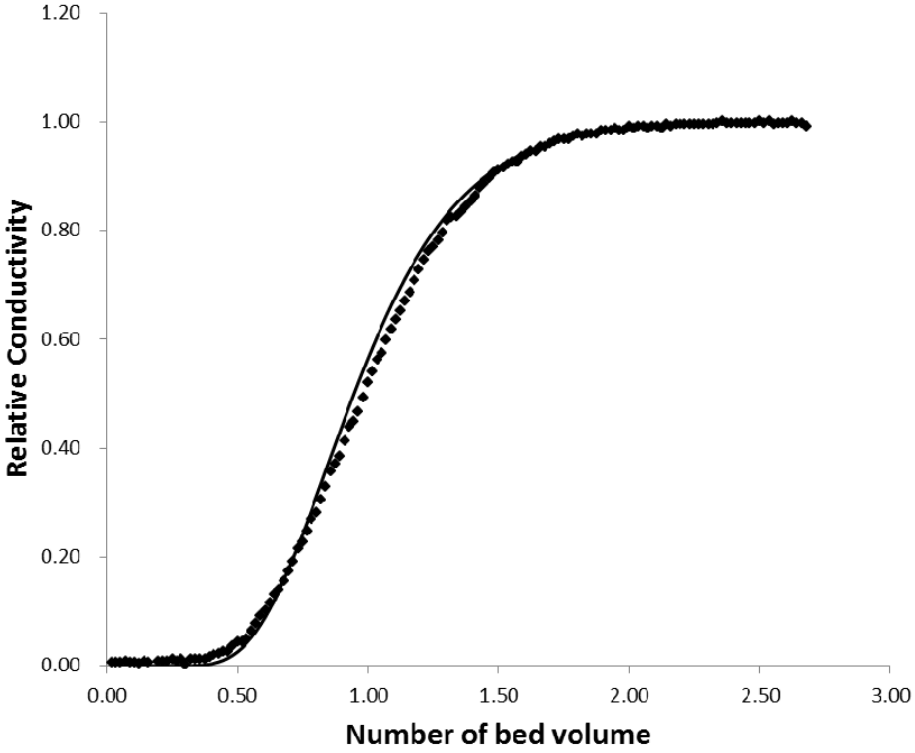

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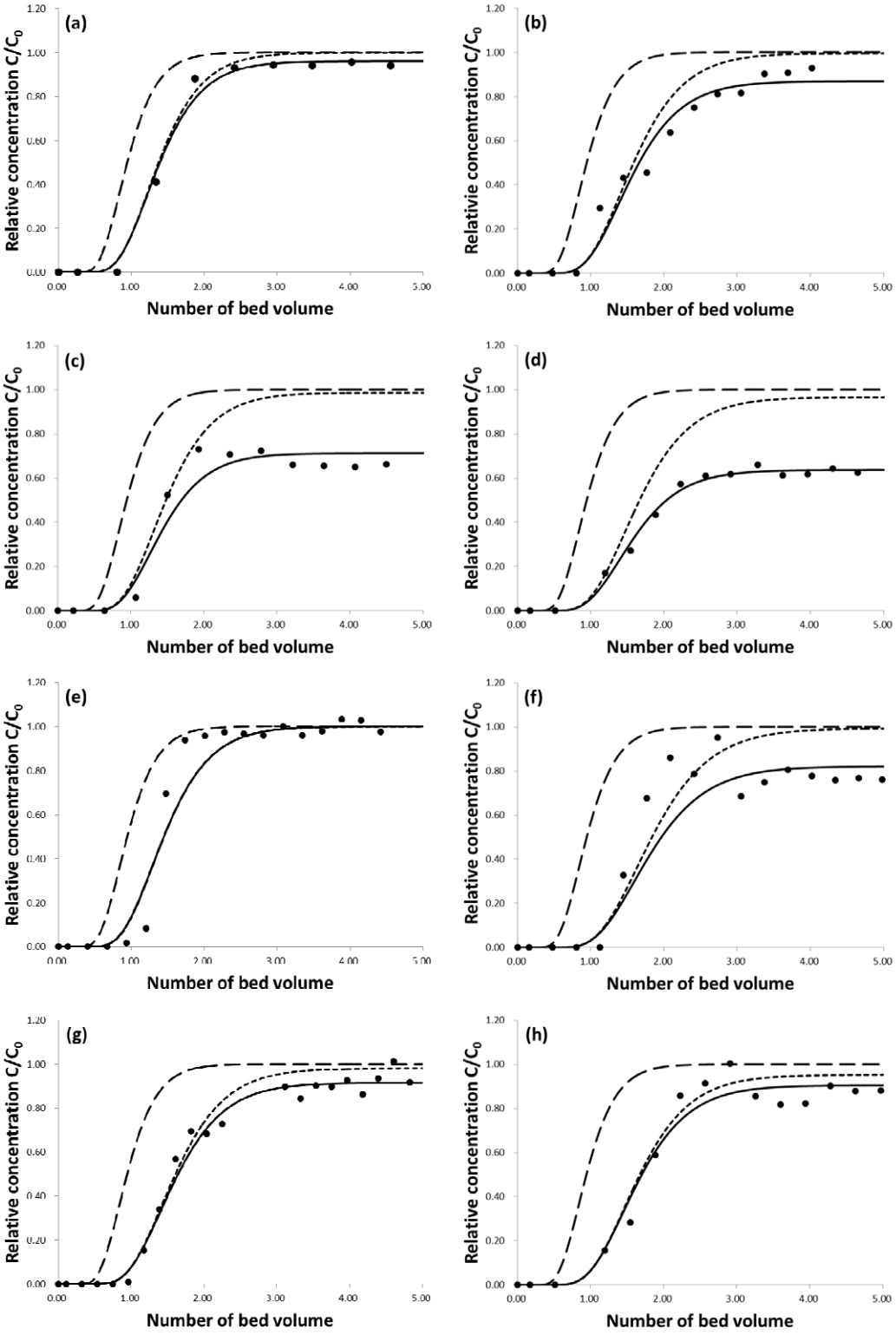

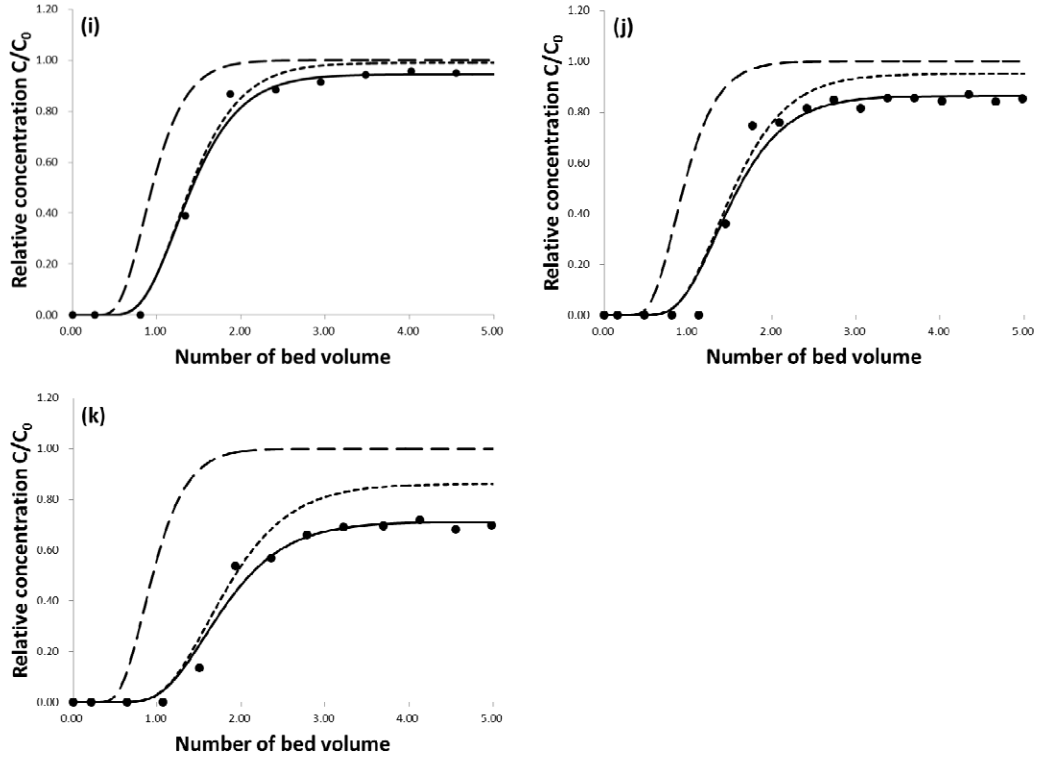

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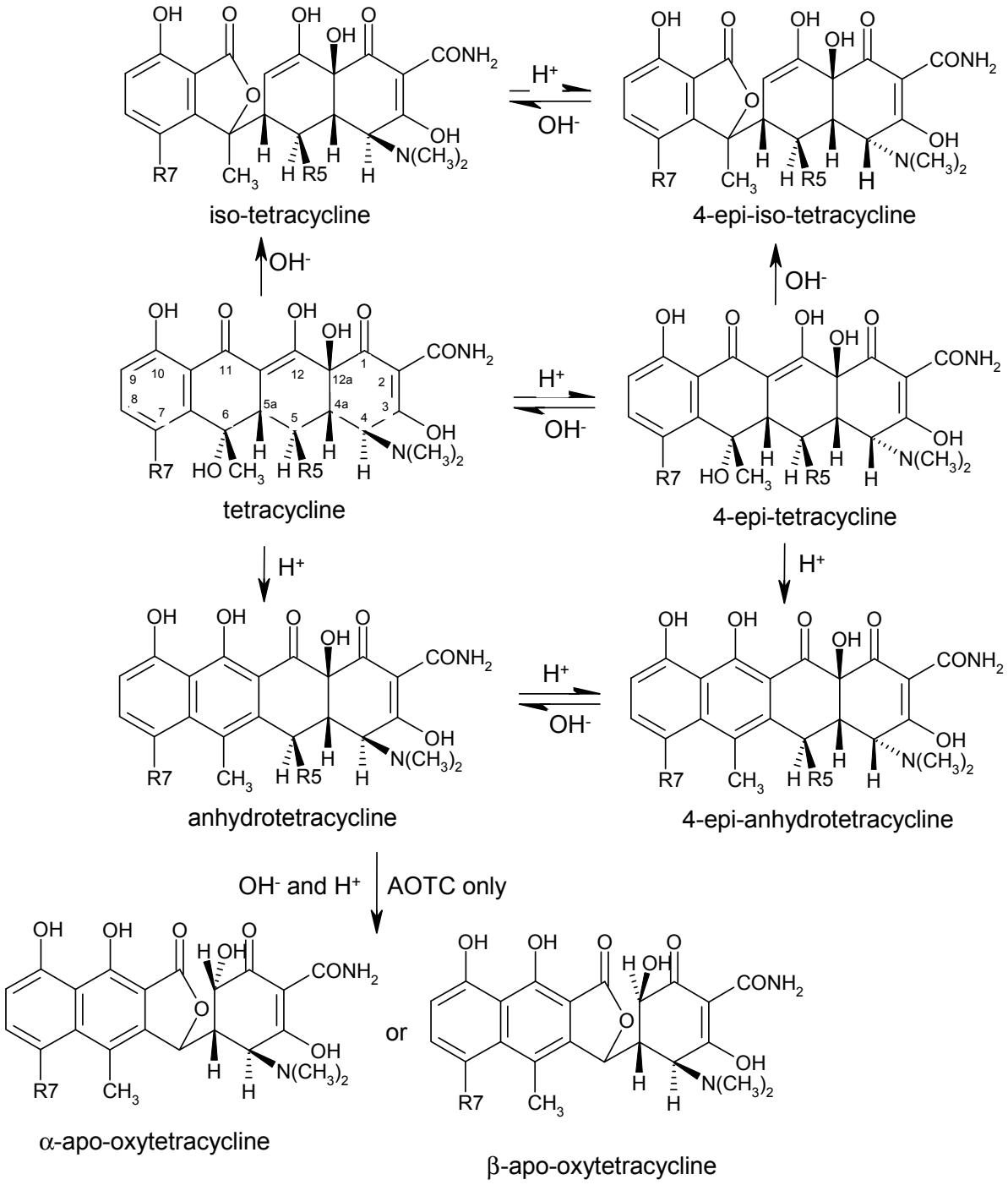

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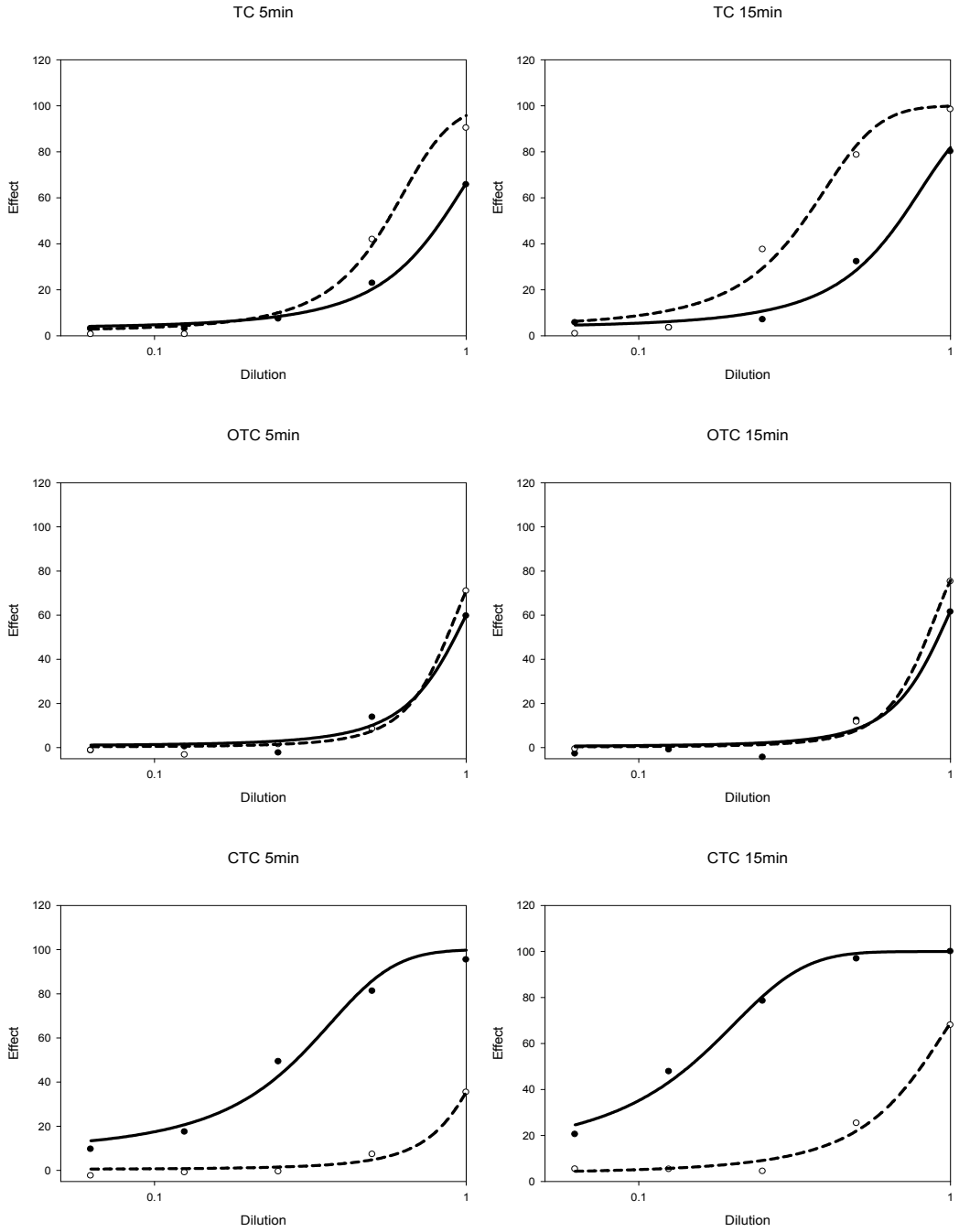

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