

Supporting information

Non-Redfield, nutrient synergy, and flexible internal elemental stoichiometry in a marine bacterium

Trautwein *et al.*

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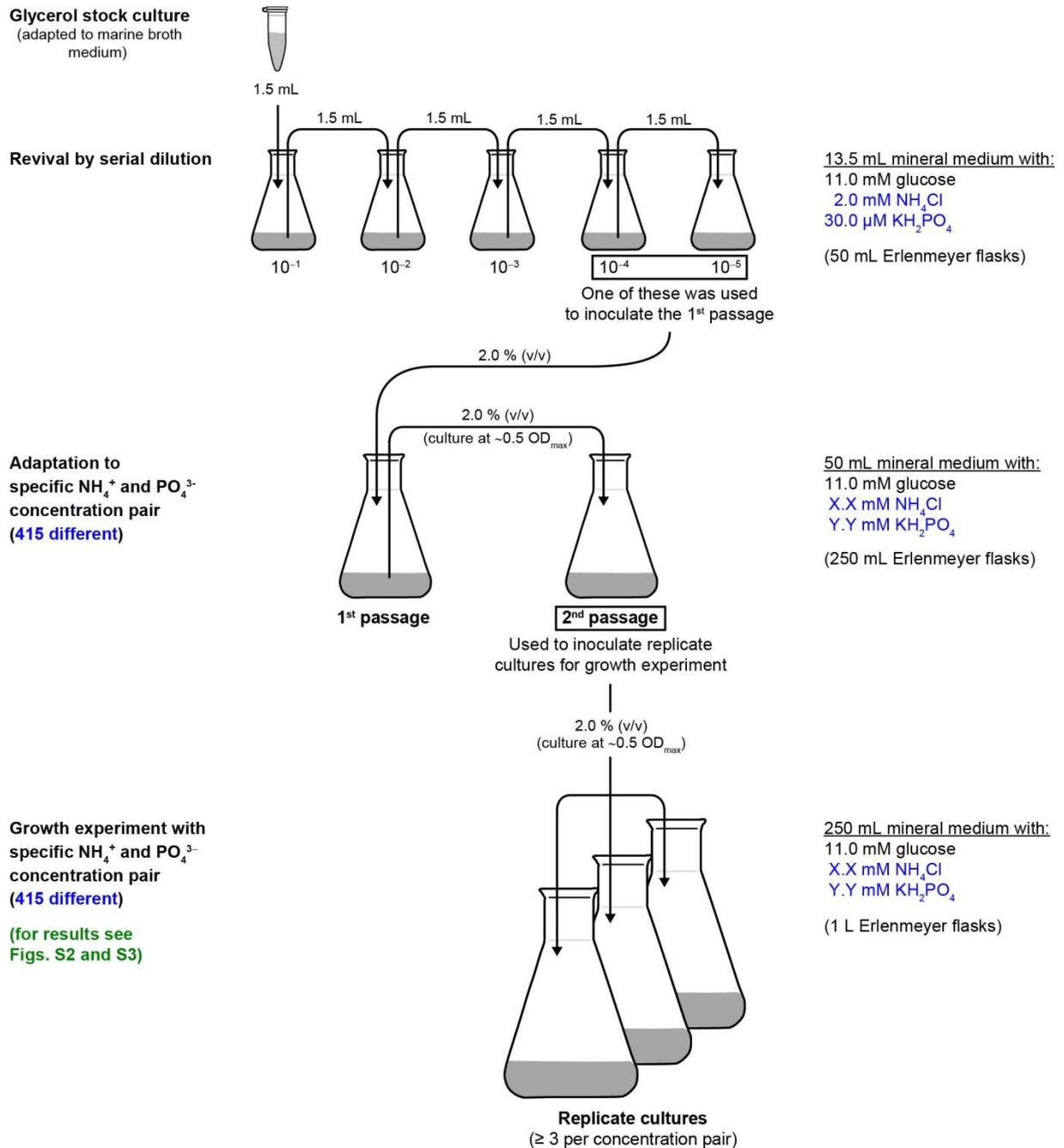
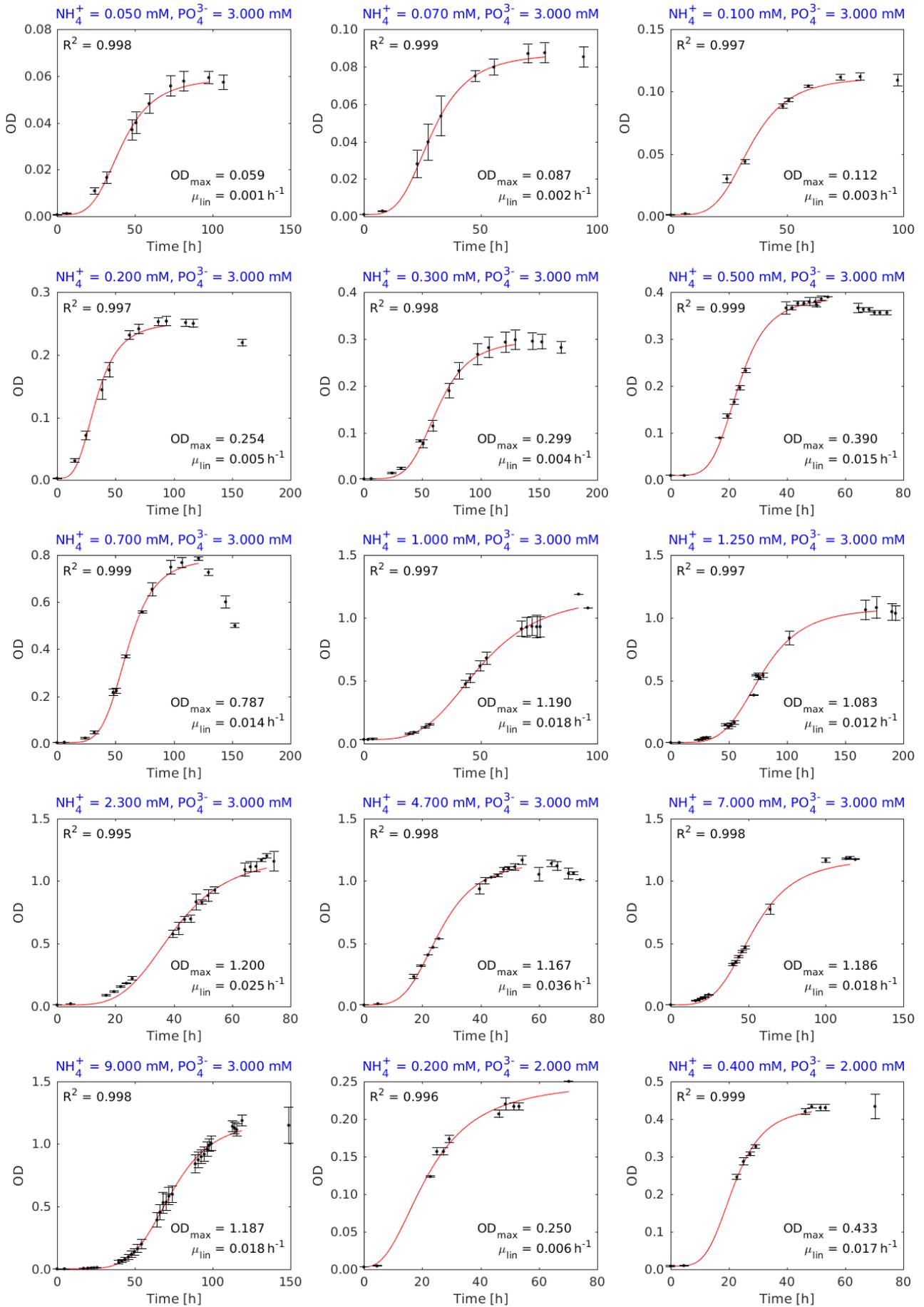
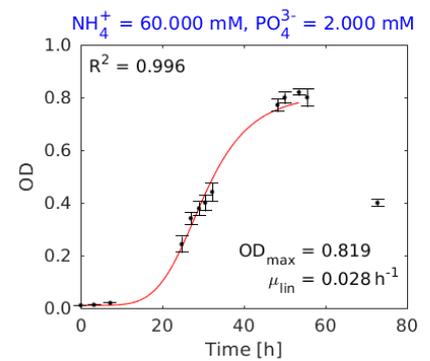
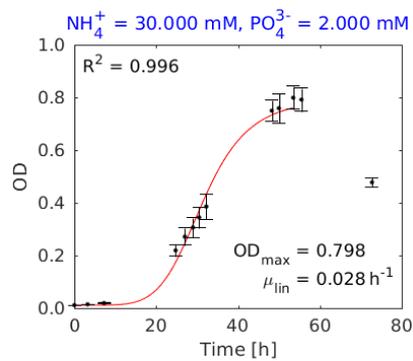
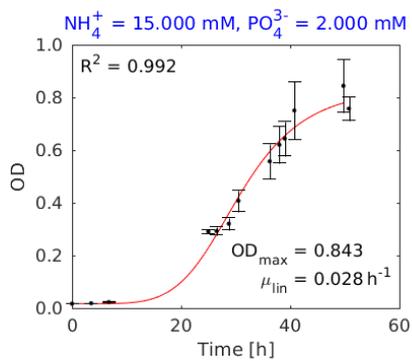
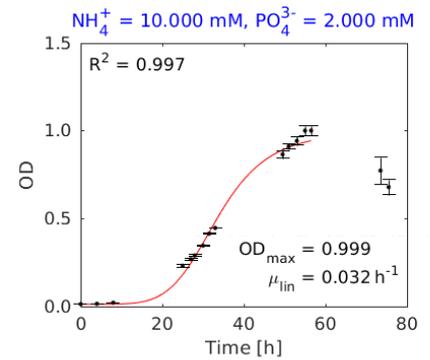
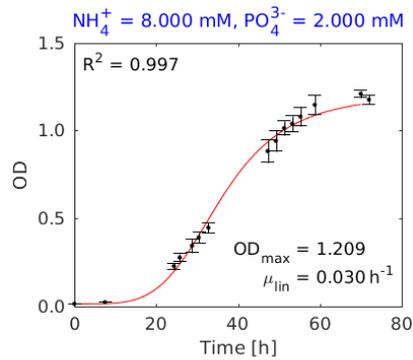
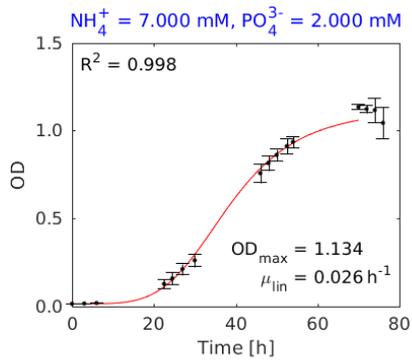
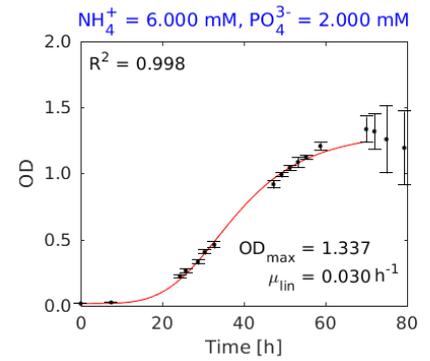
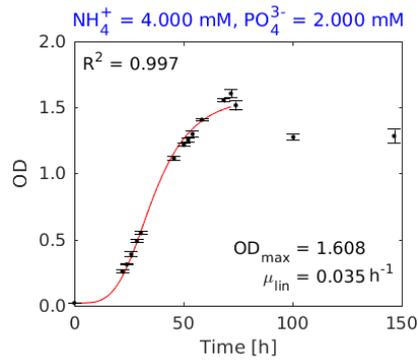
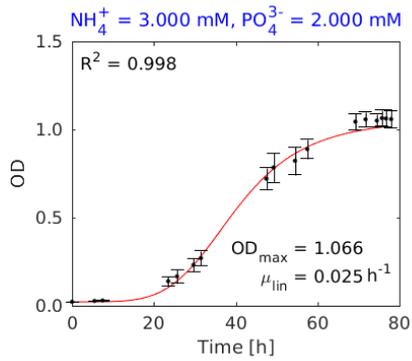
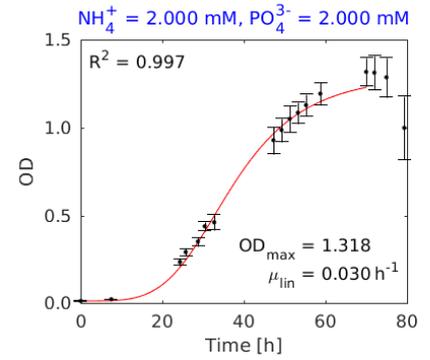
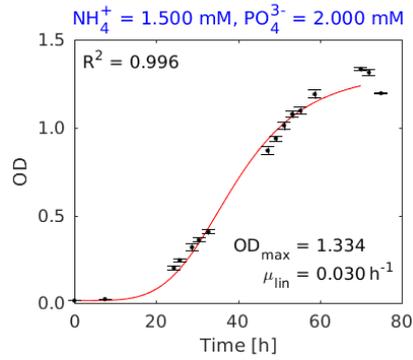
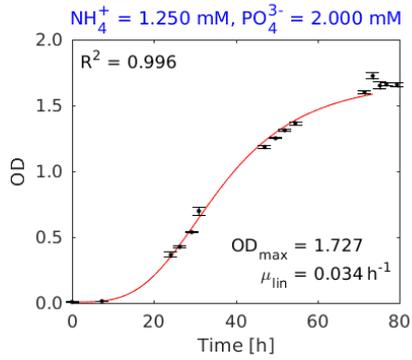
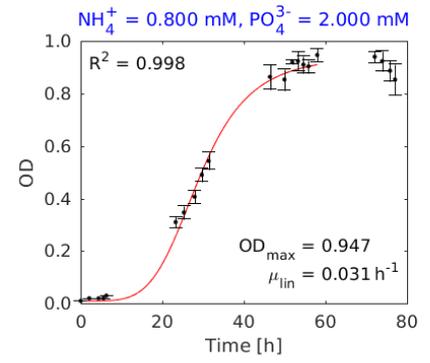
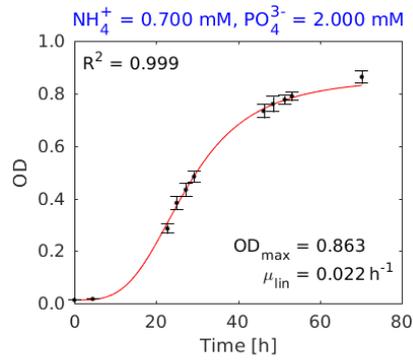
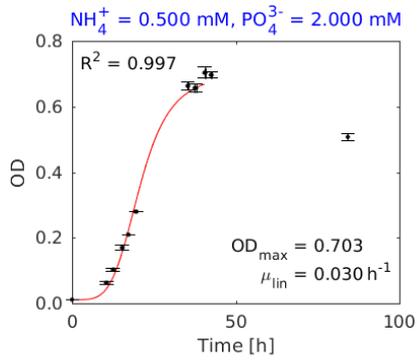
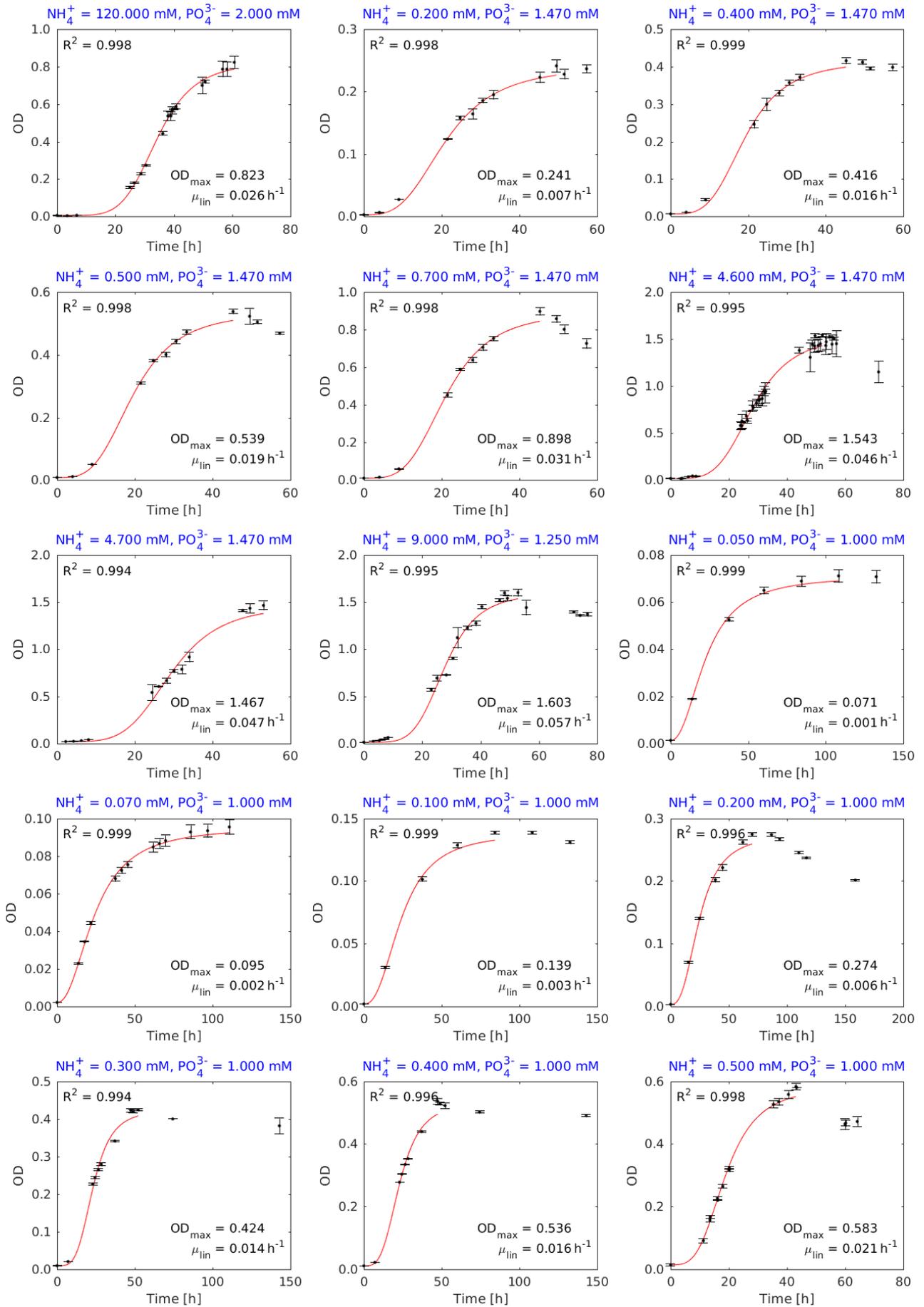
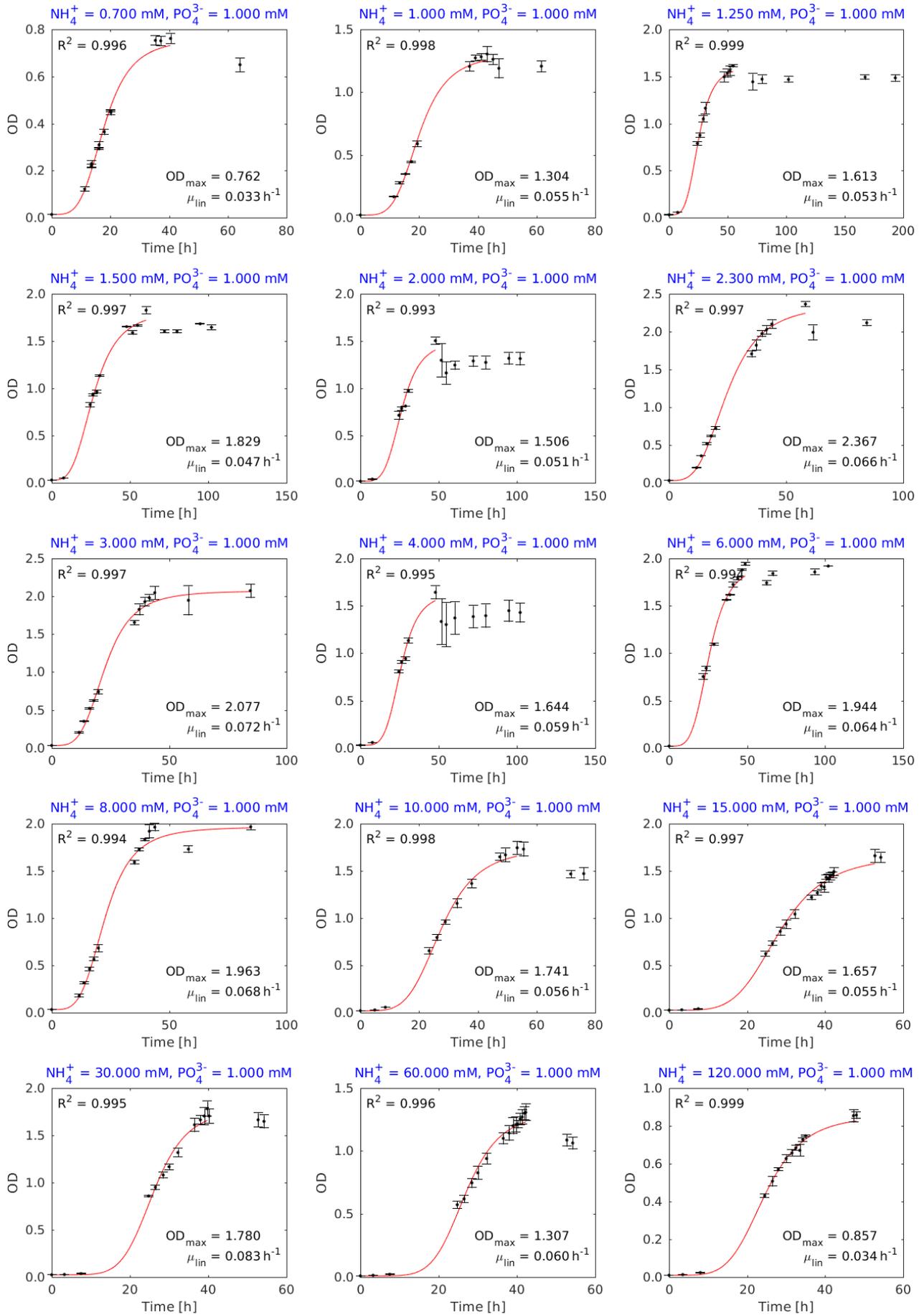


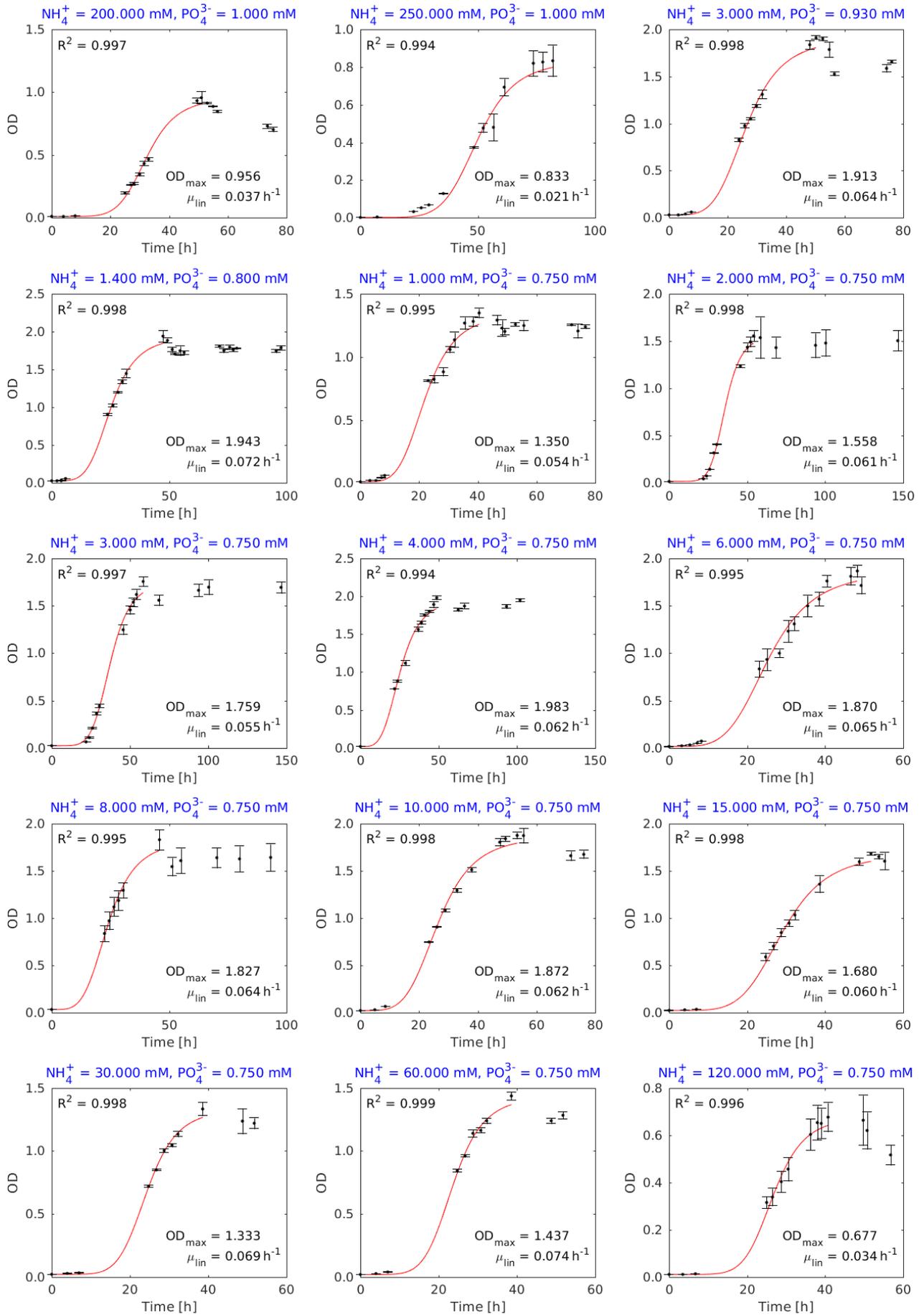
Figure S1 Cultivation workflow in physiological experiments. Each growth experiment covering one of the 415 different NH₄⁺ and PO₄³⁻ concentration pairs followed a stringent cultivation procedure, starting from an individual glycerol stock culture. Glassware was specifically cleansed with HCl at PO₄³⁻ concentrations <50 μM.

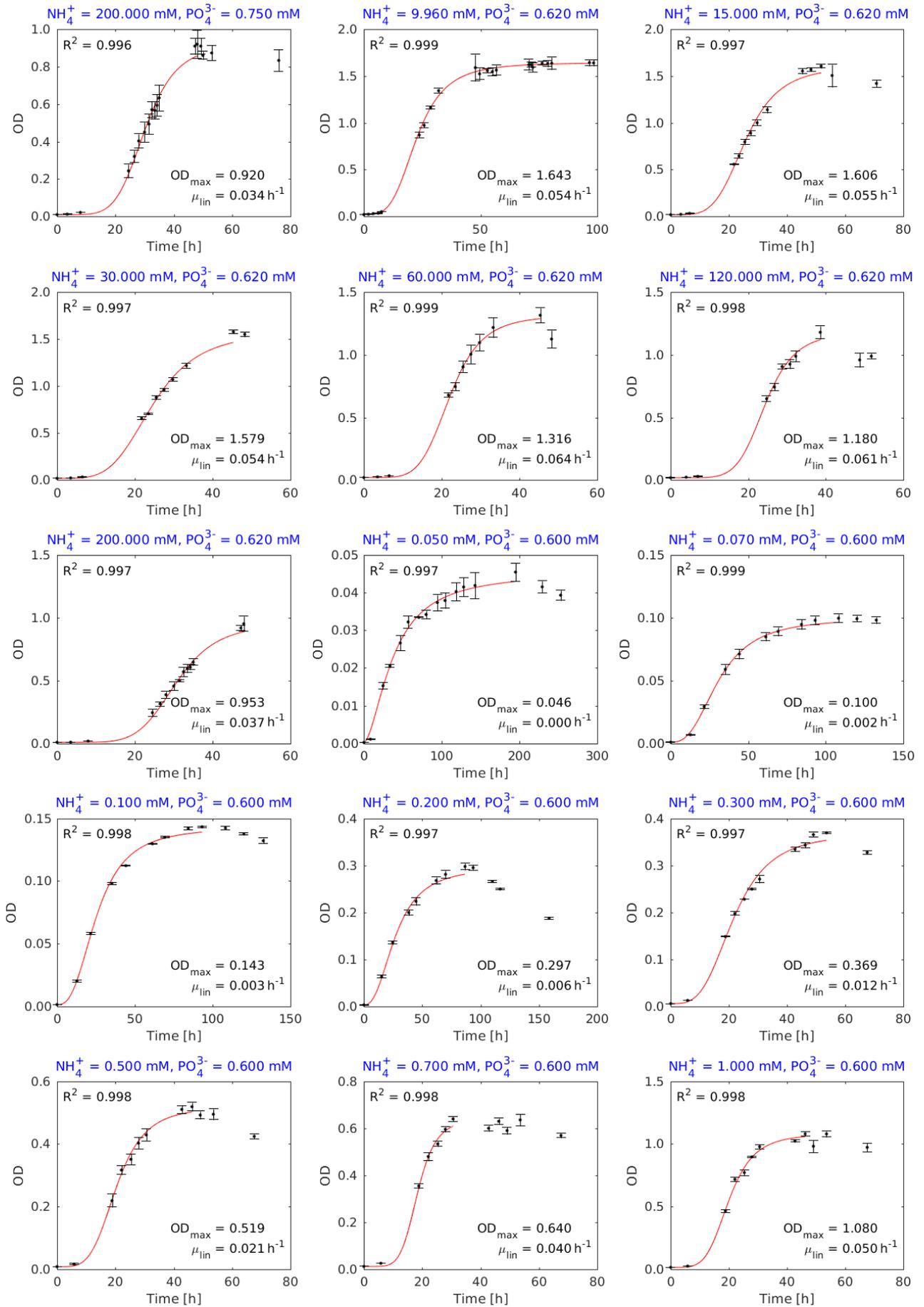


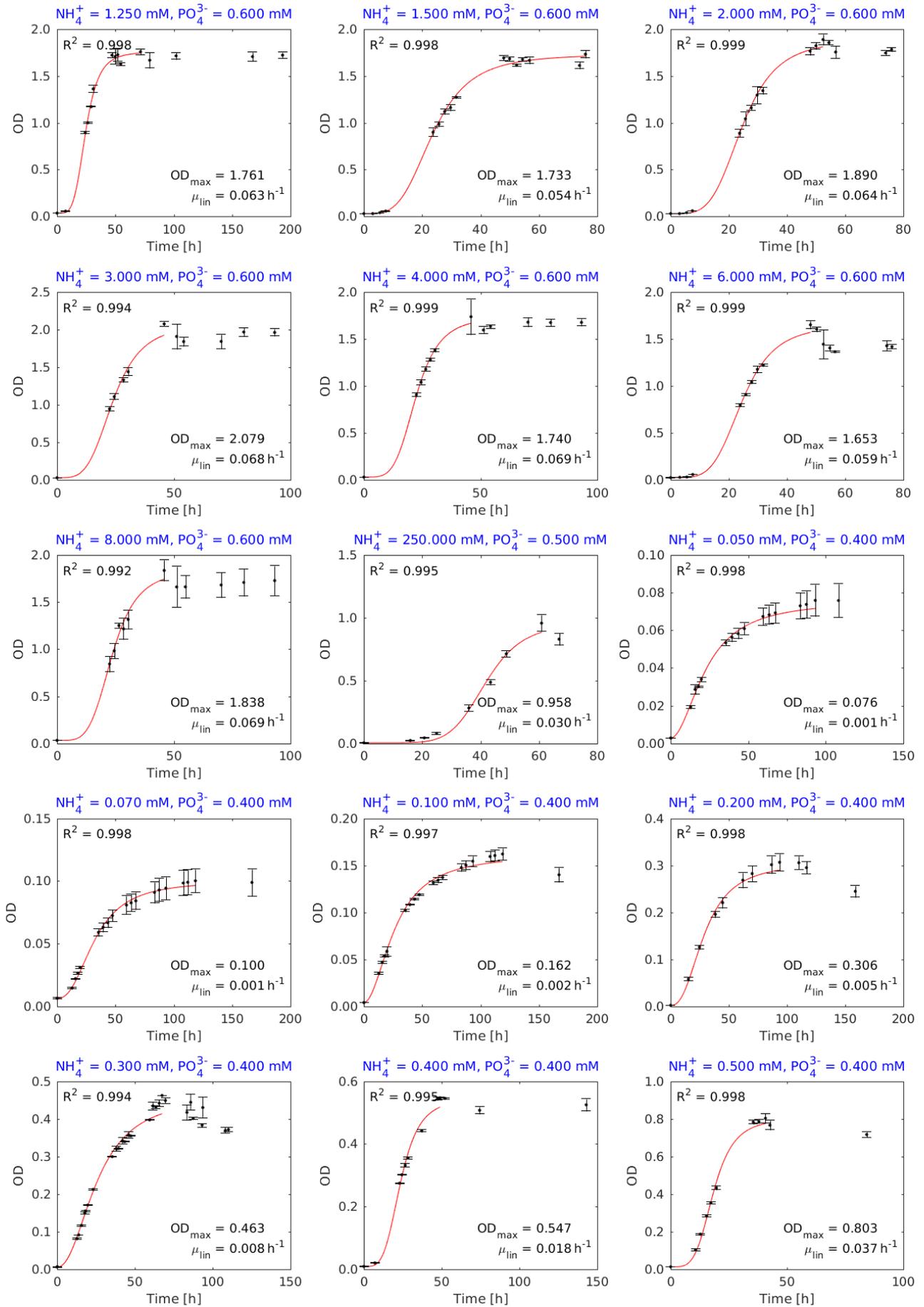


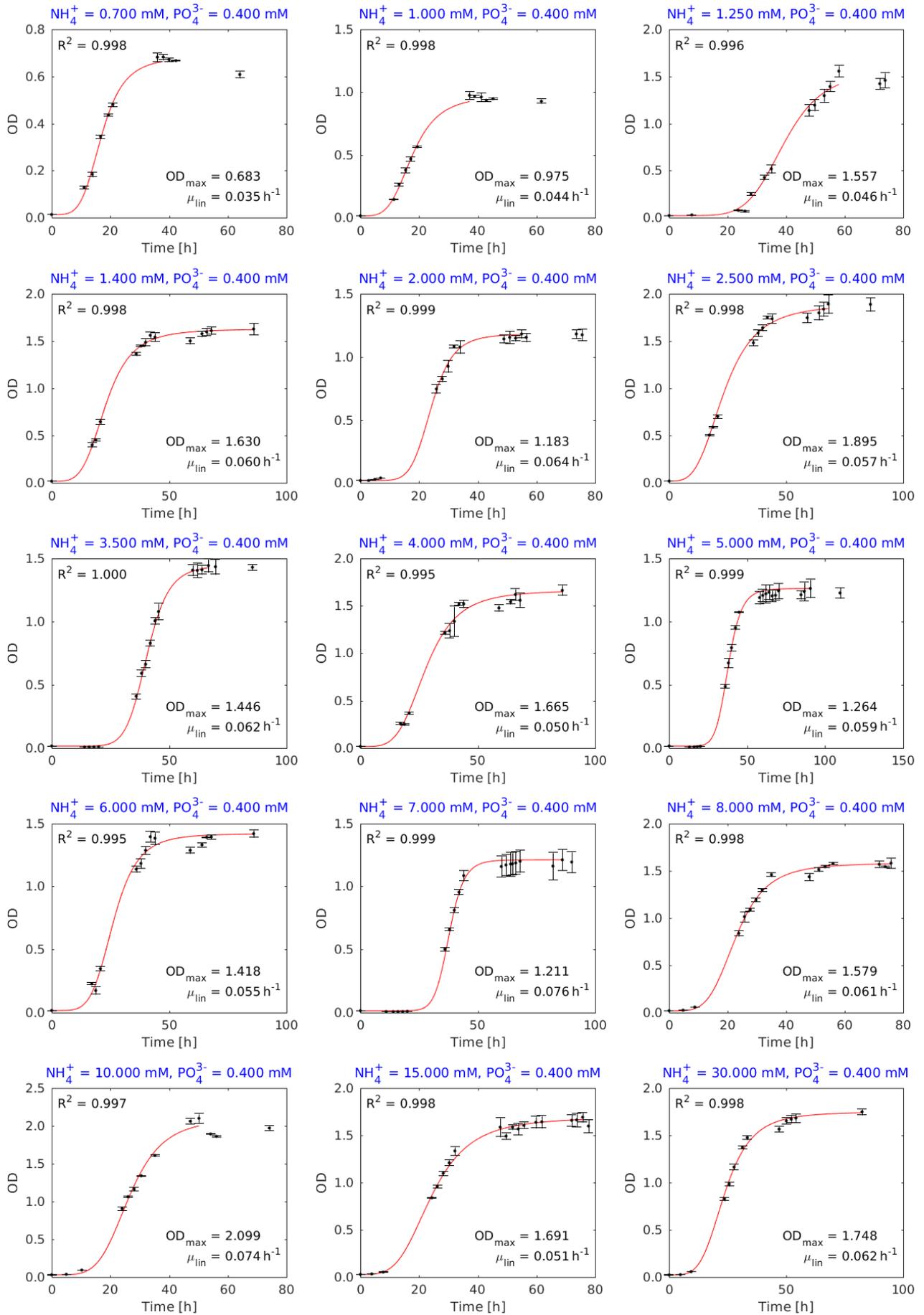


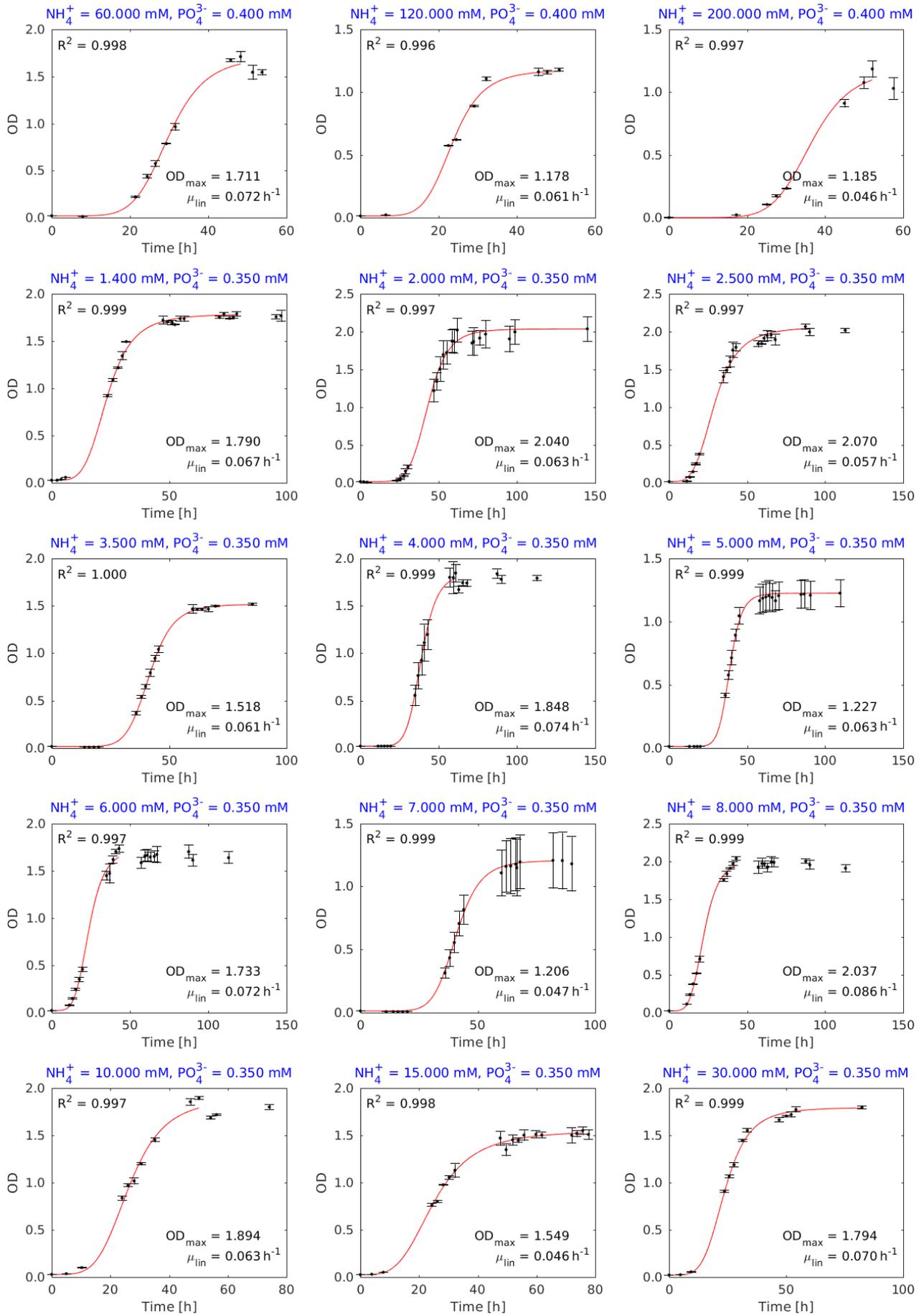


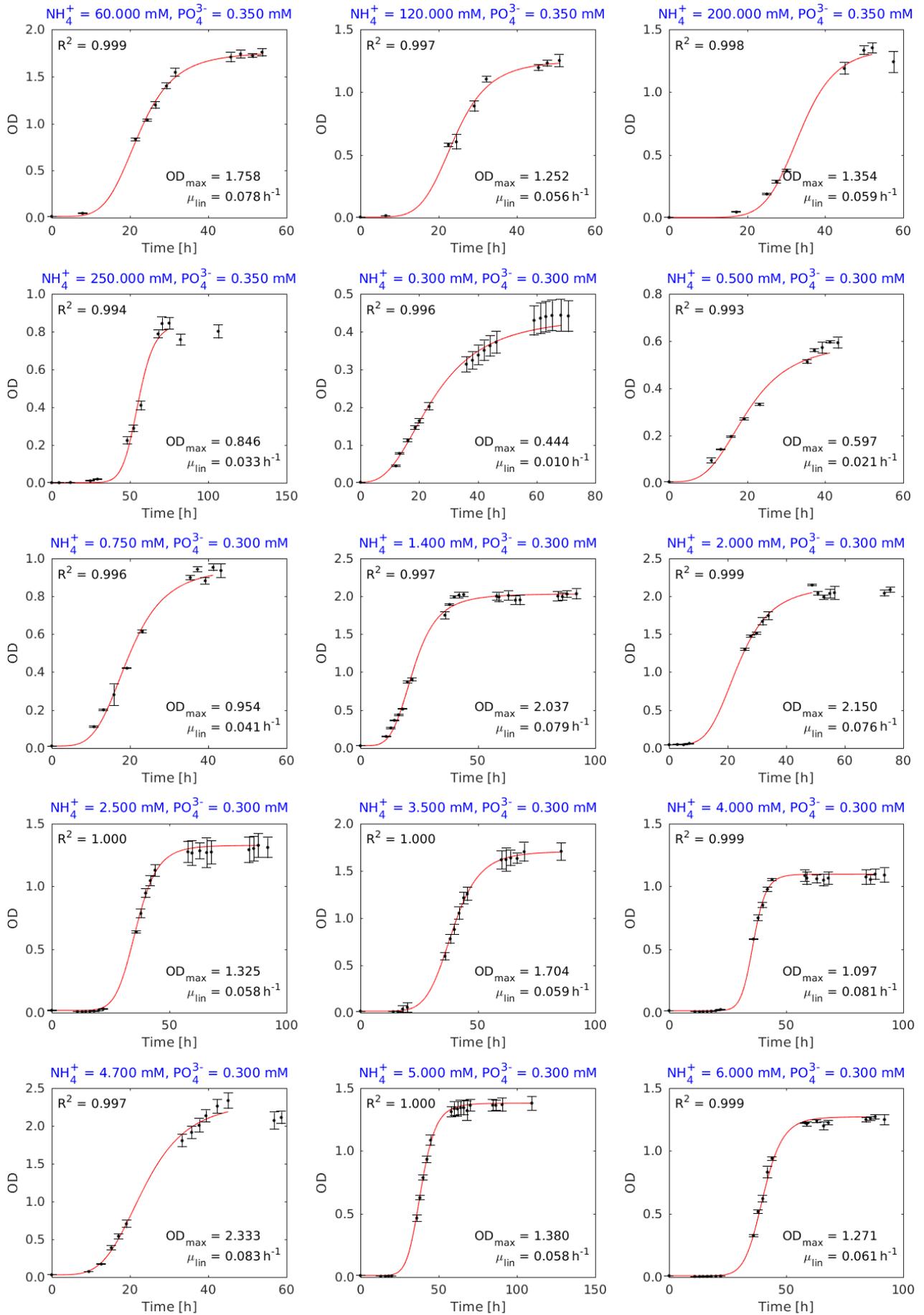


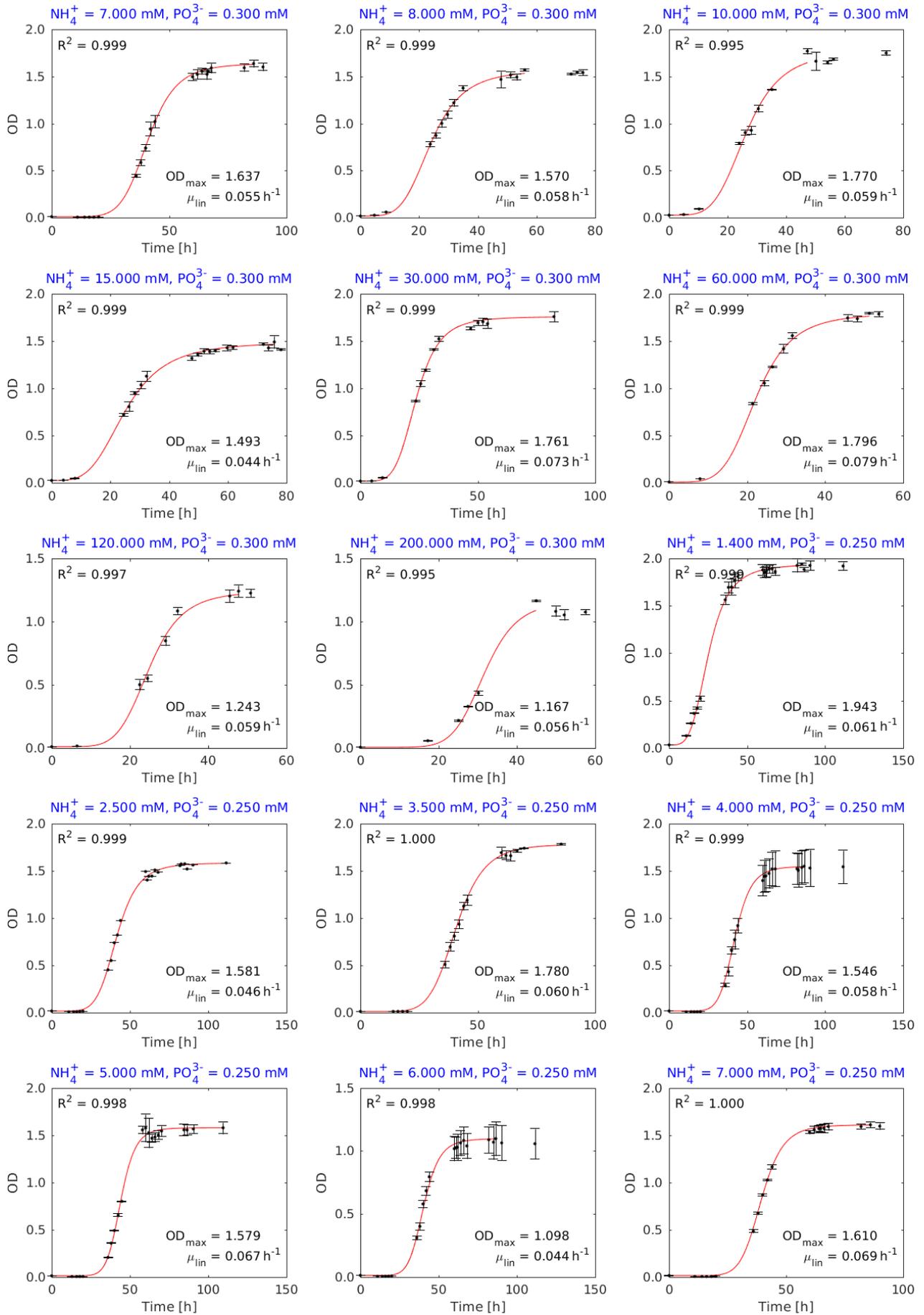


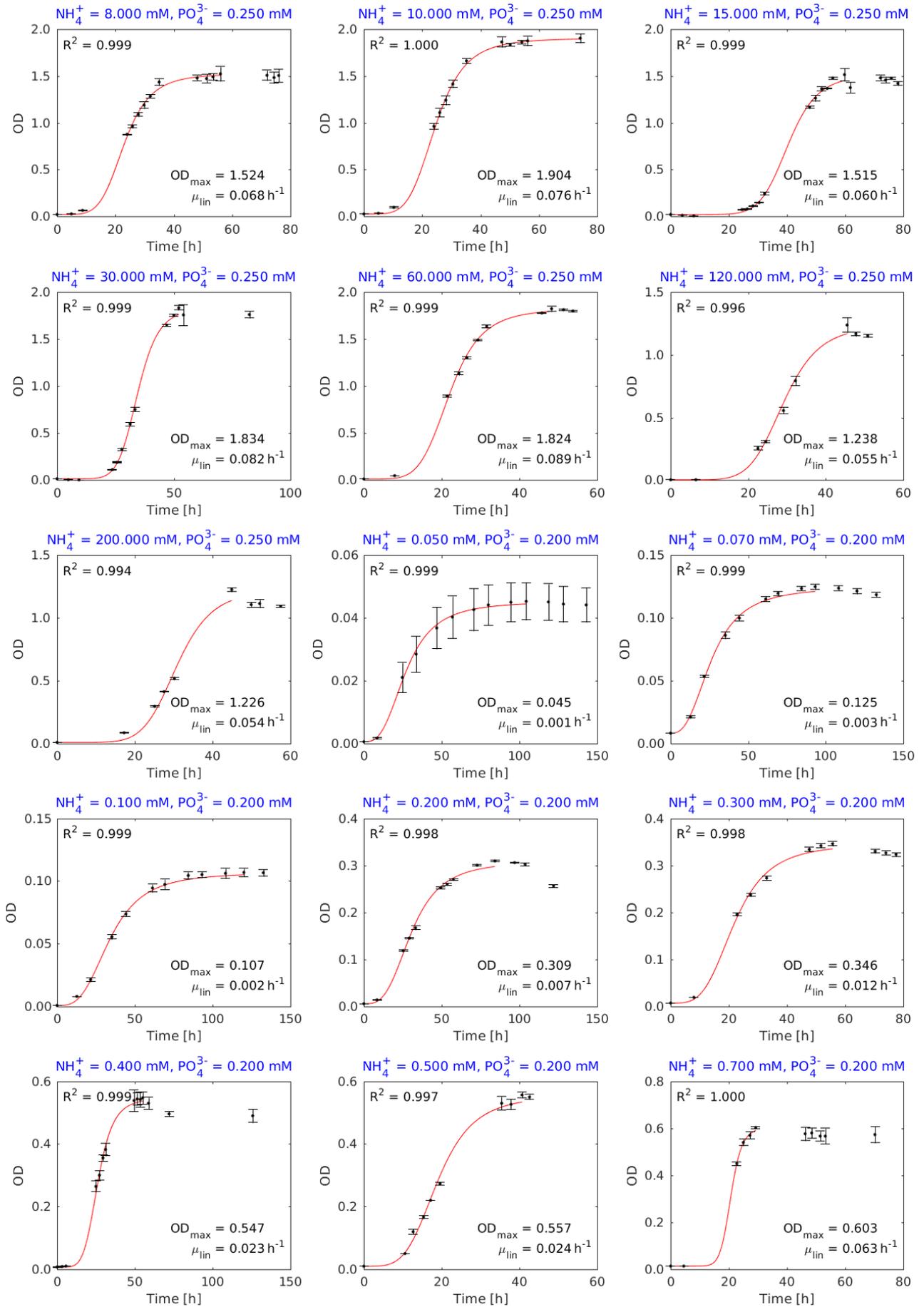


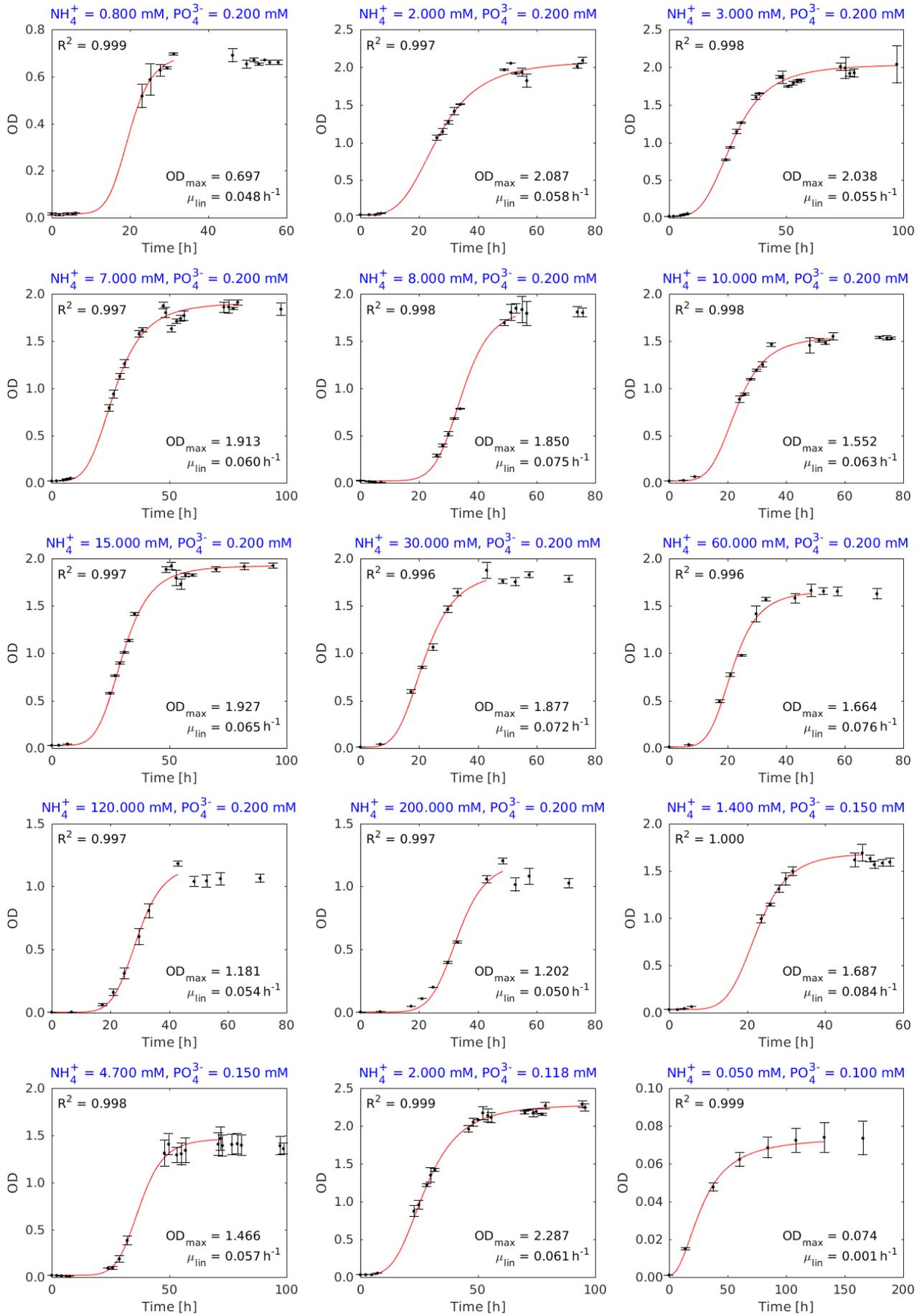


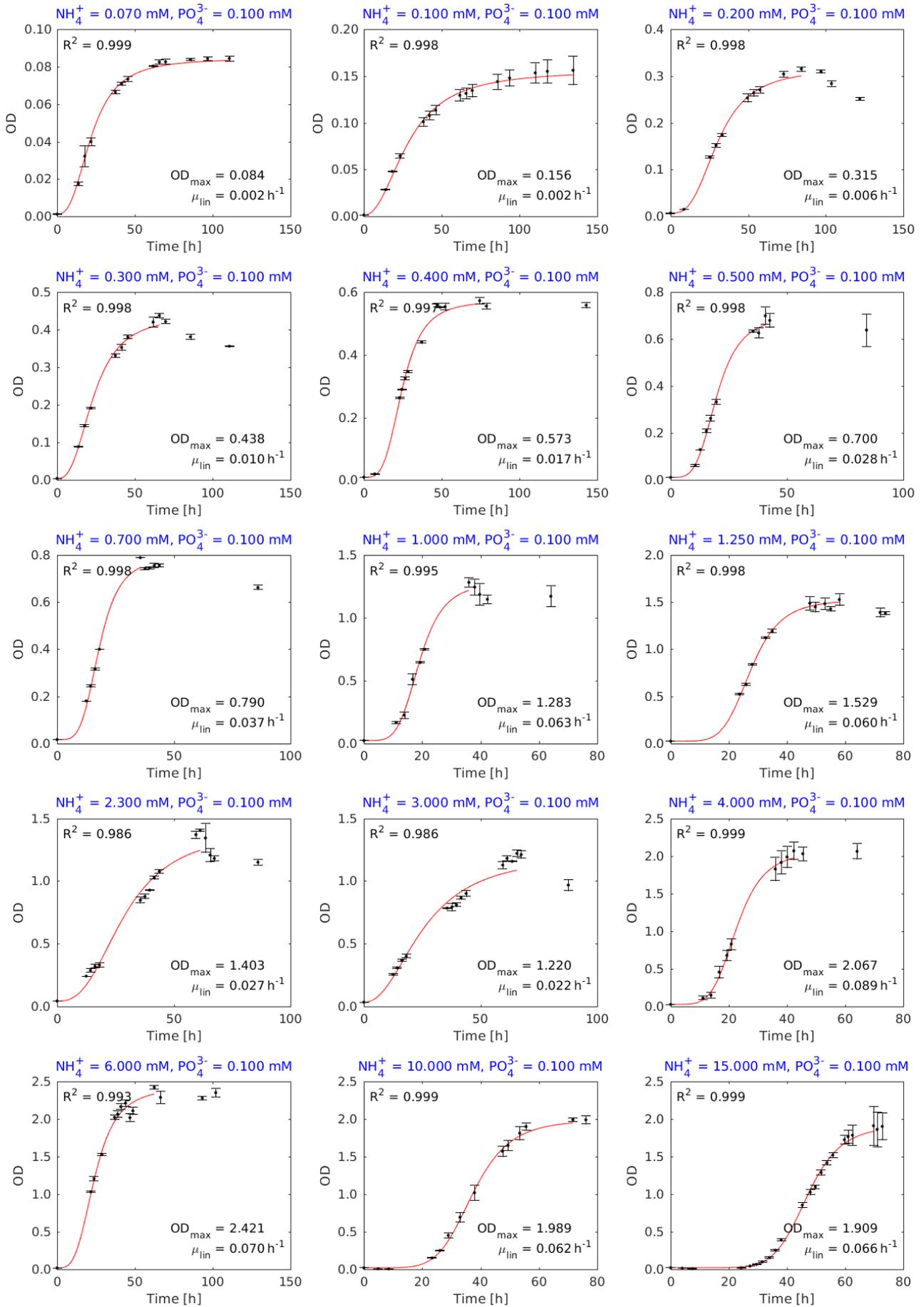


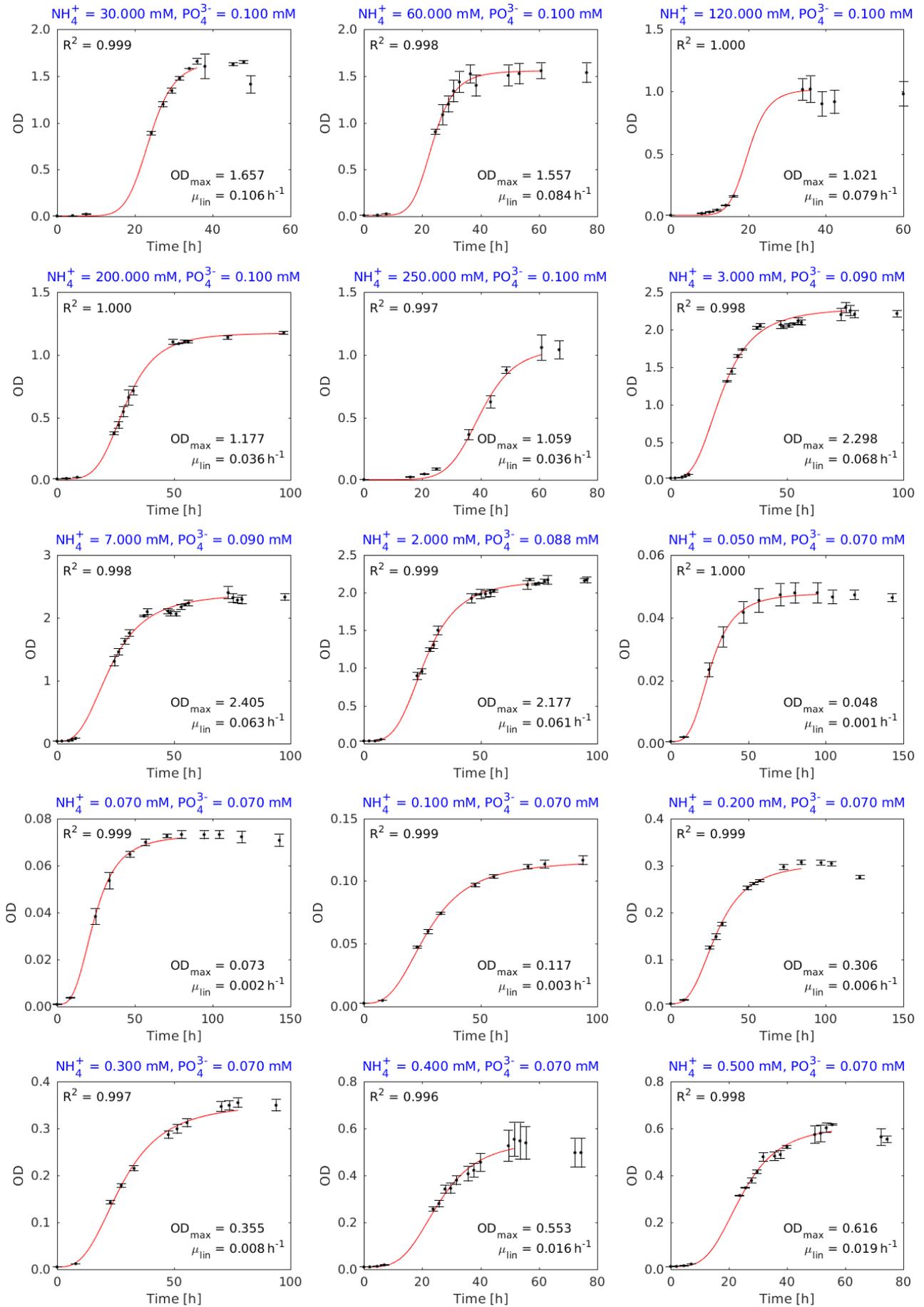


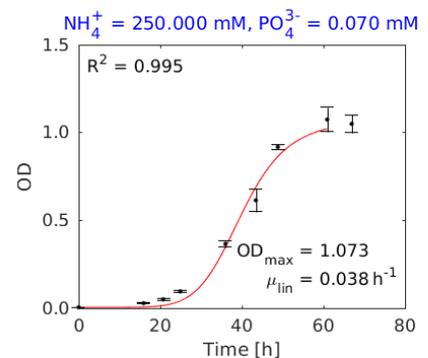
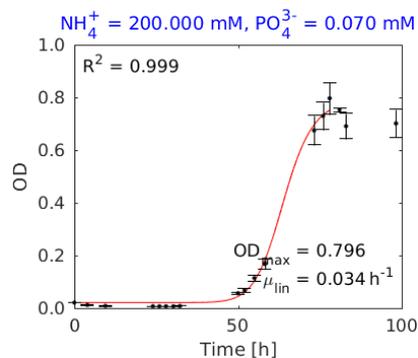
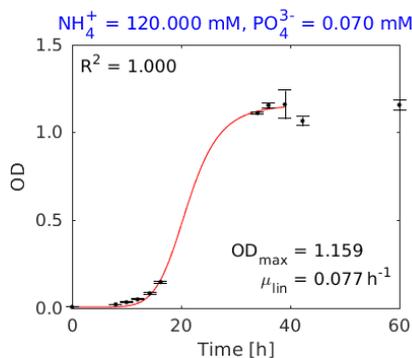
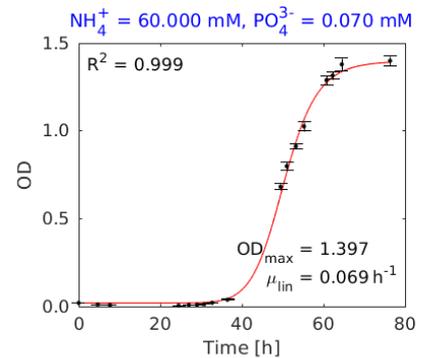
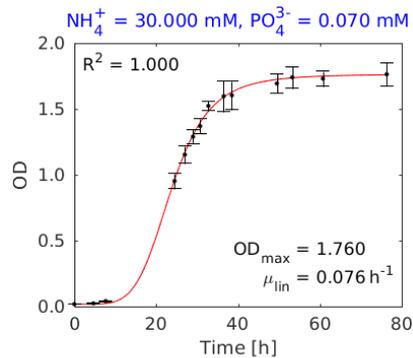
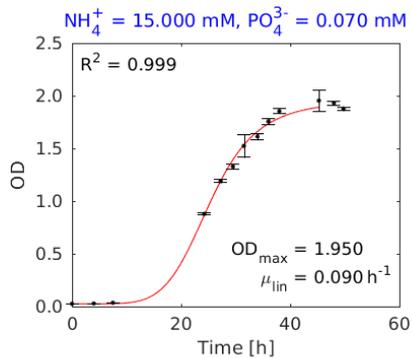
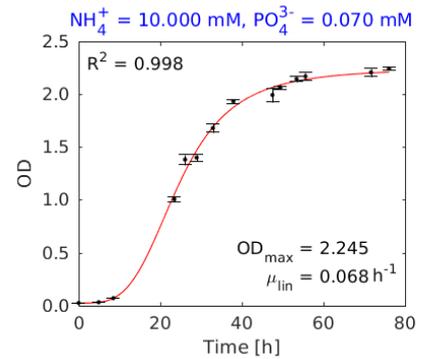
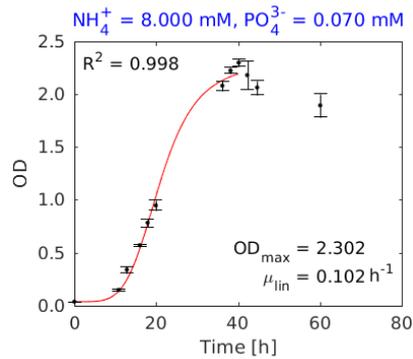
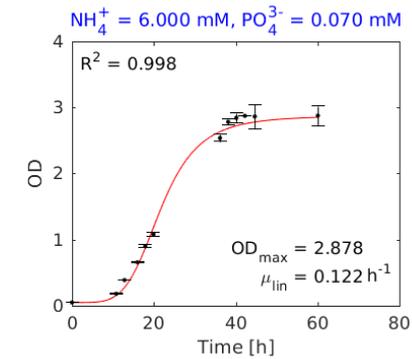
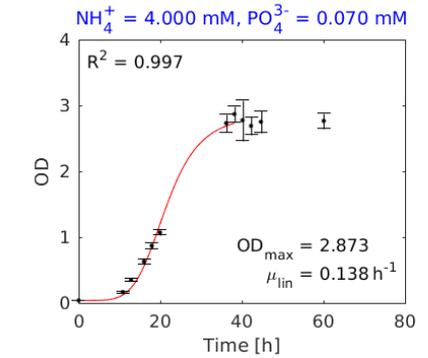
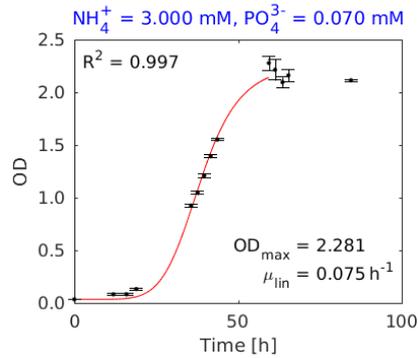
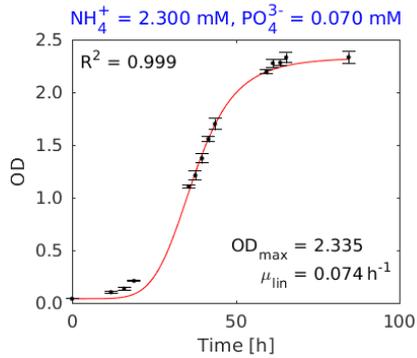
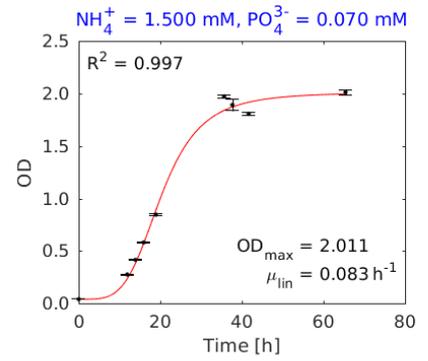
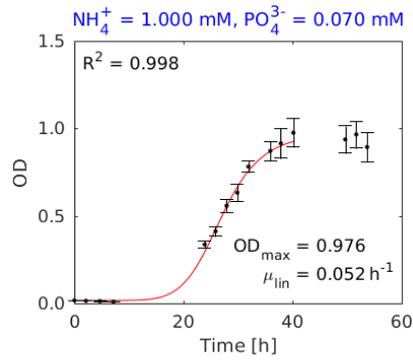
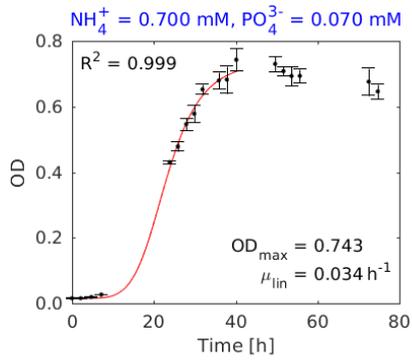


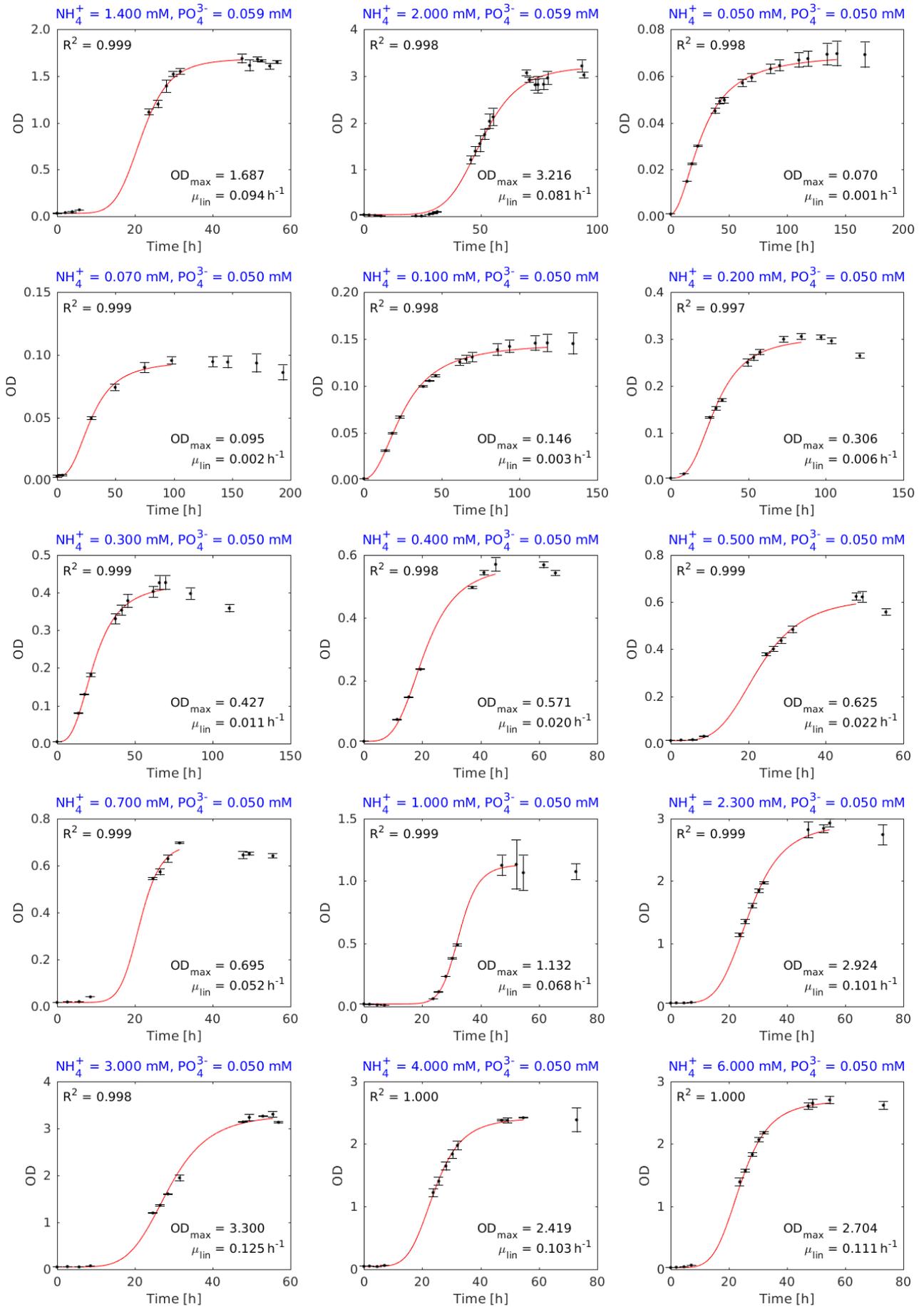


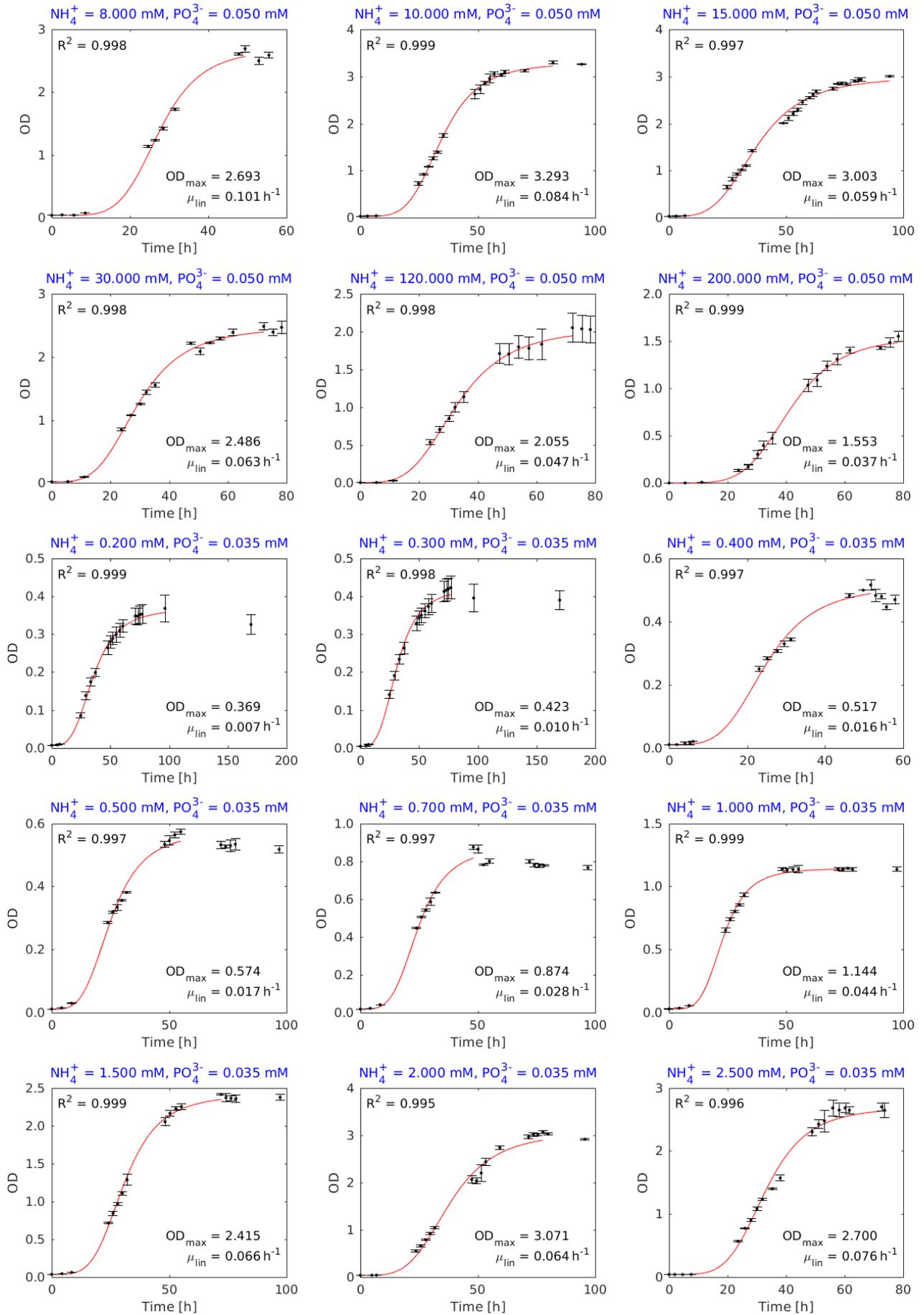


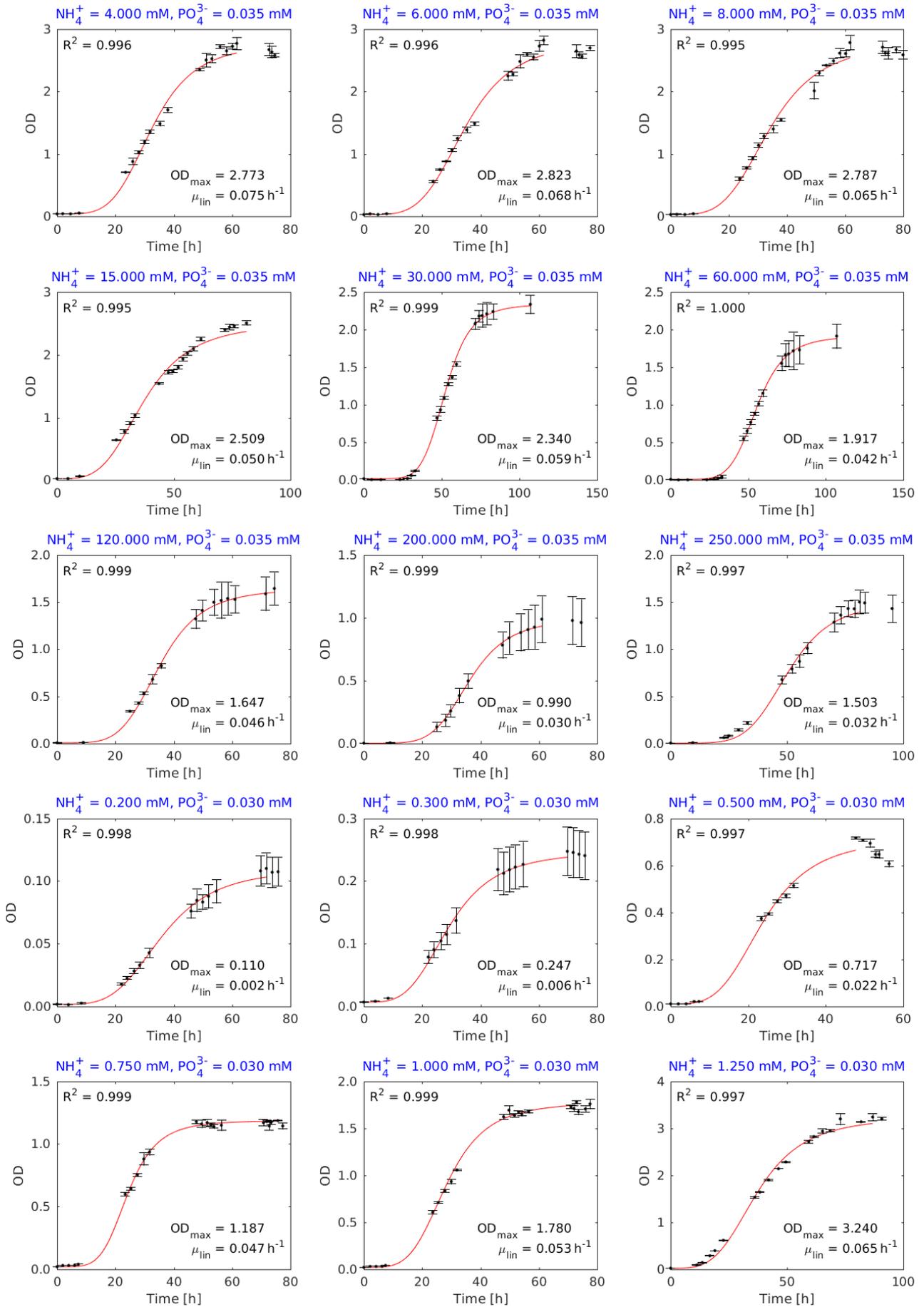


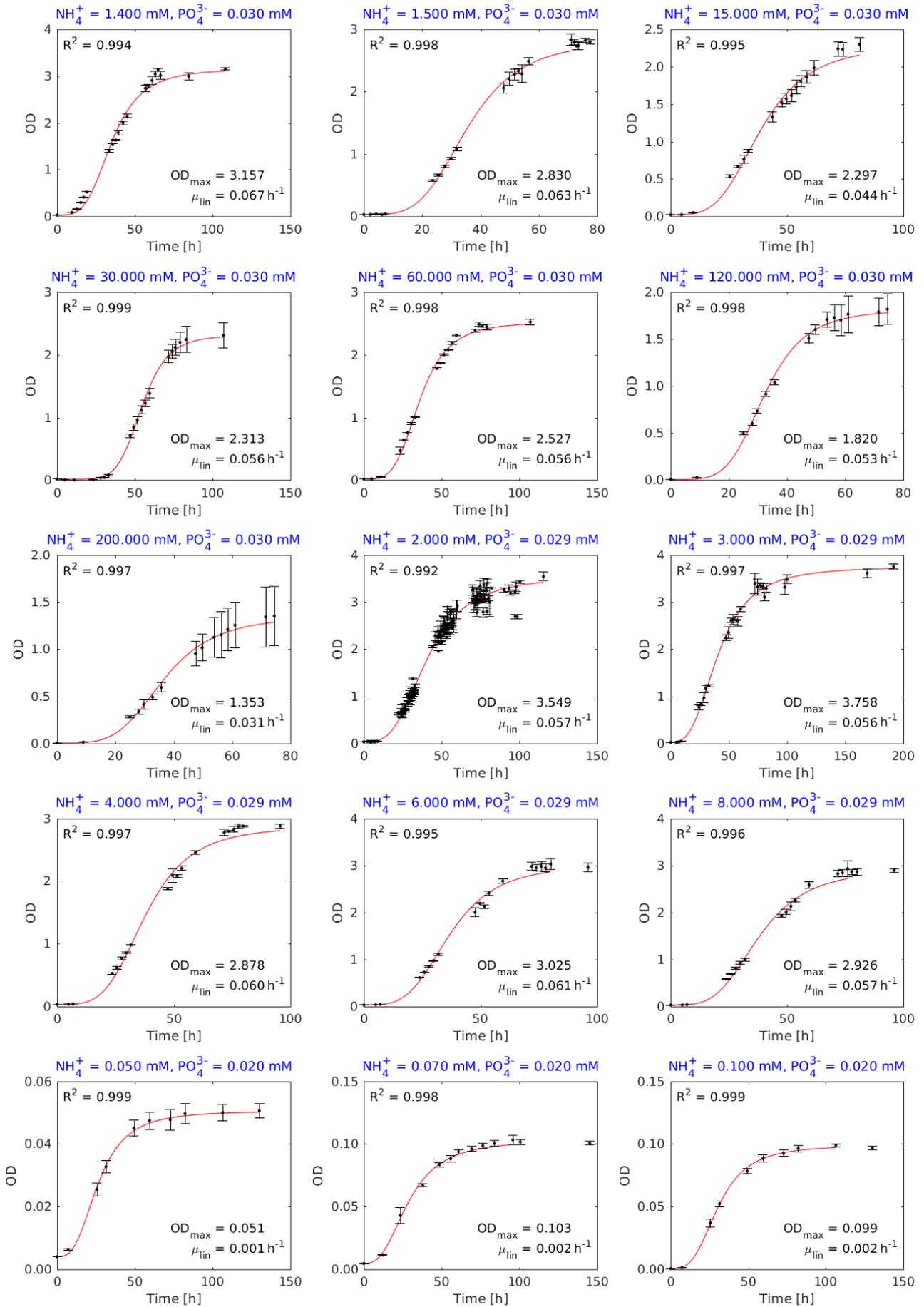


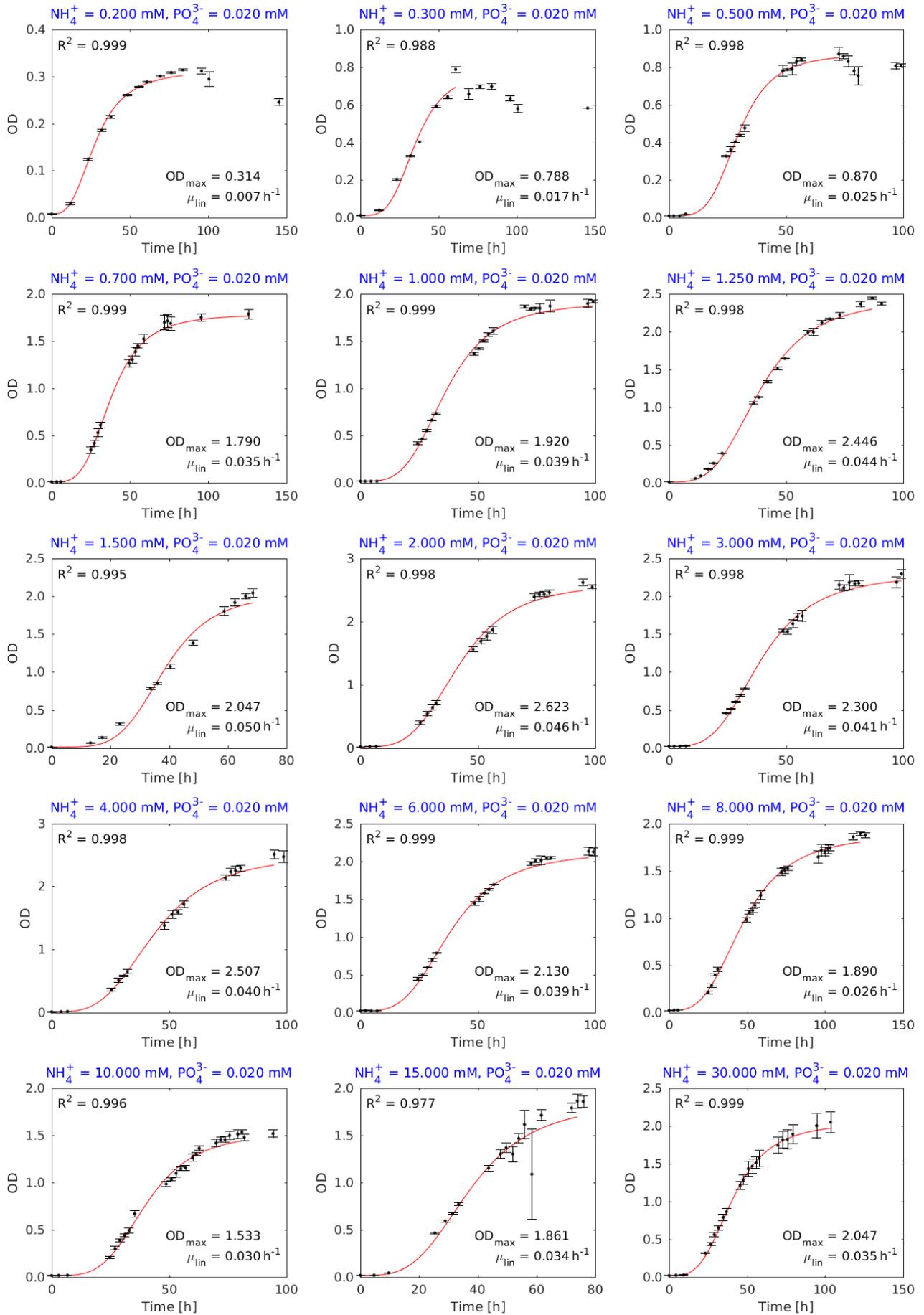


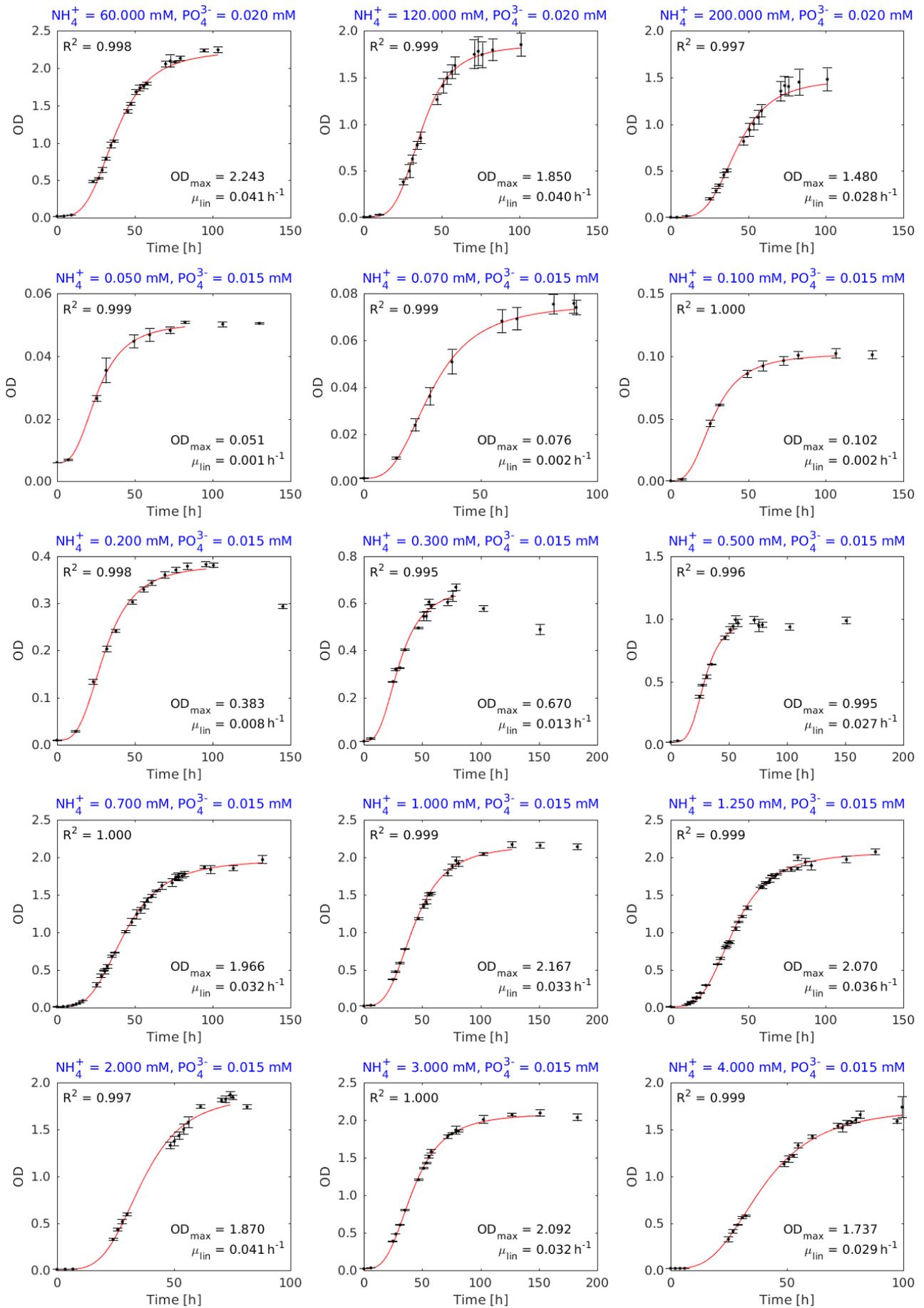


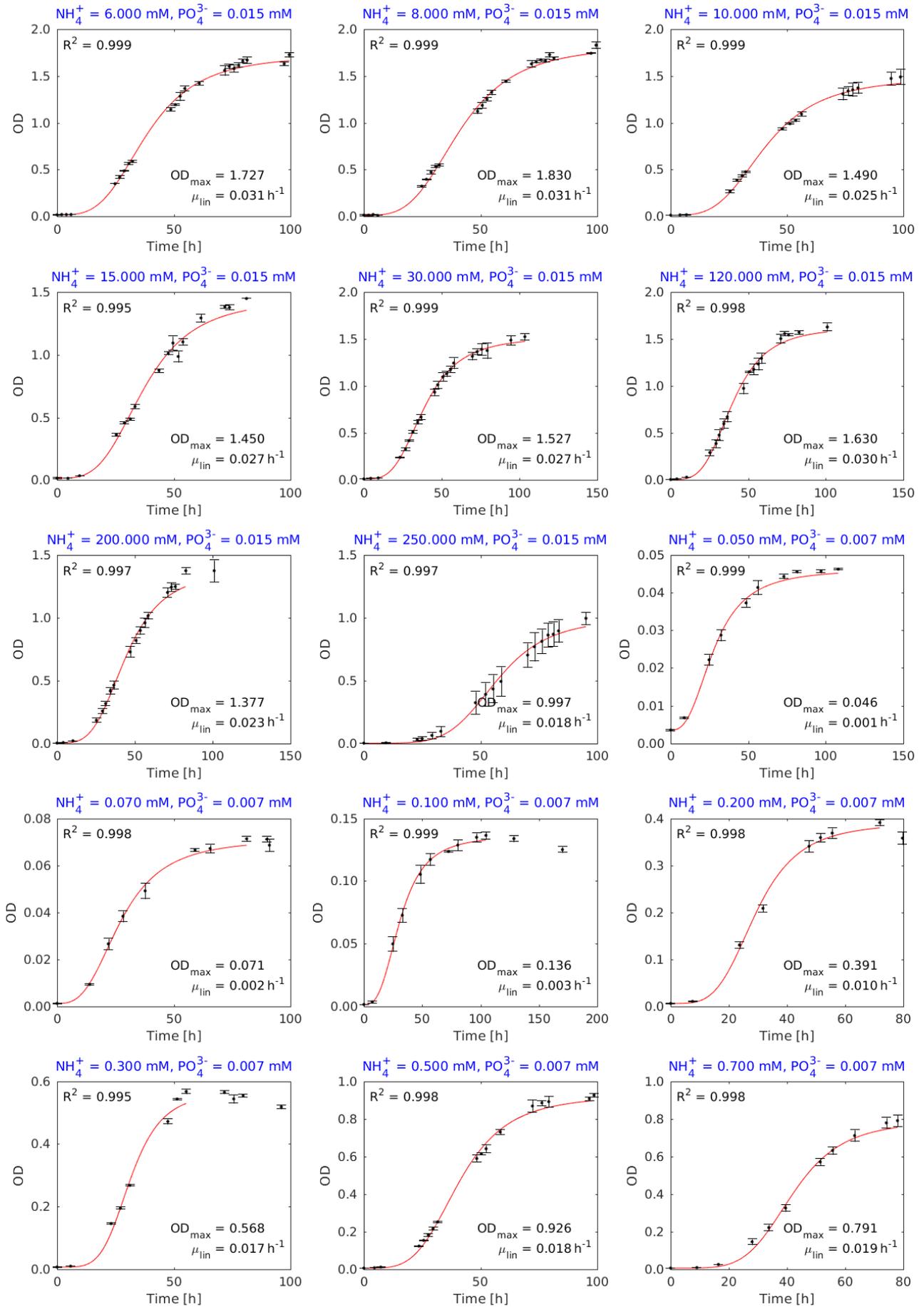


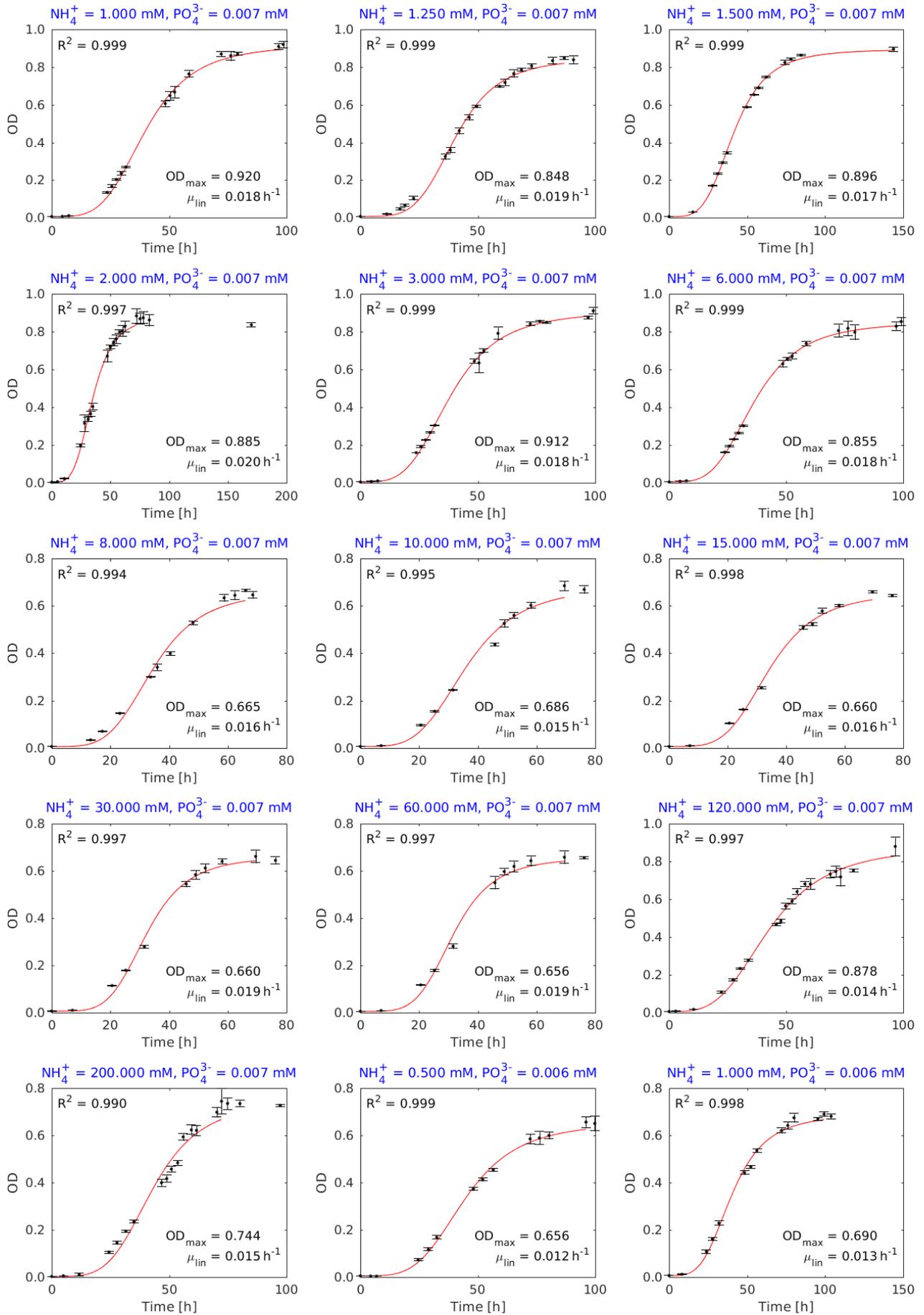


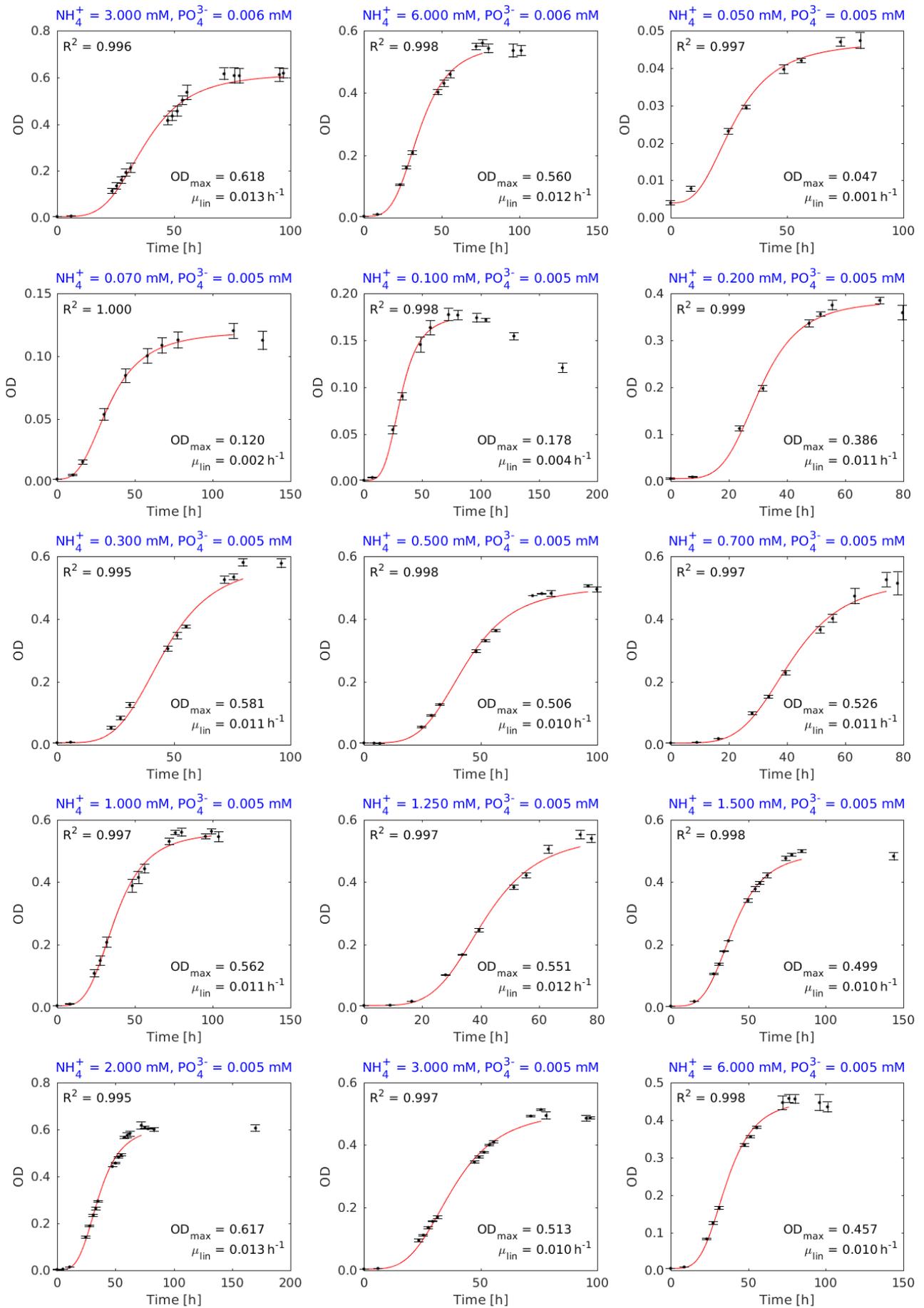


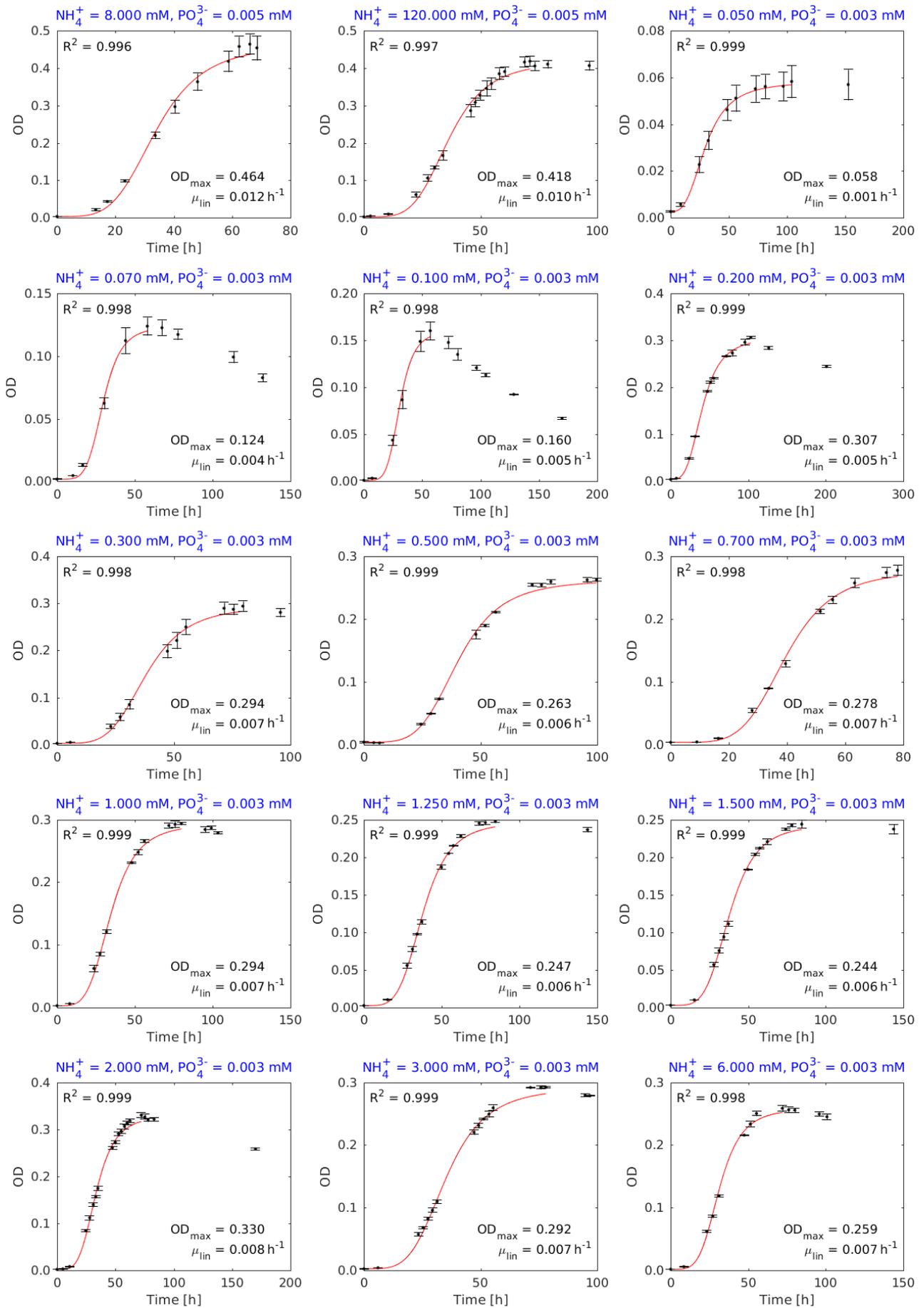


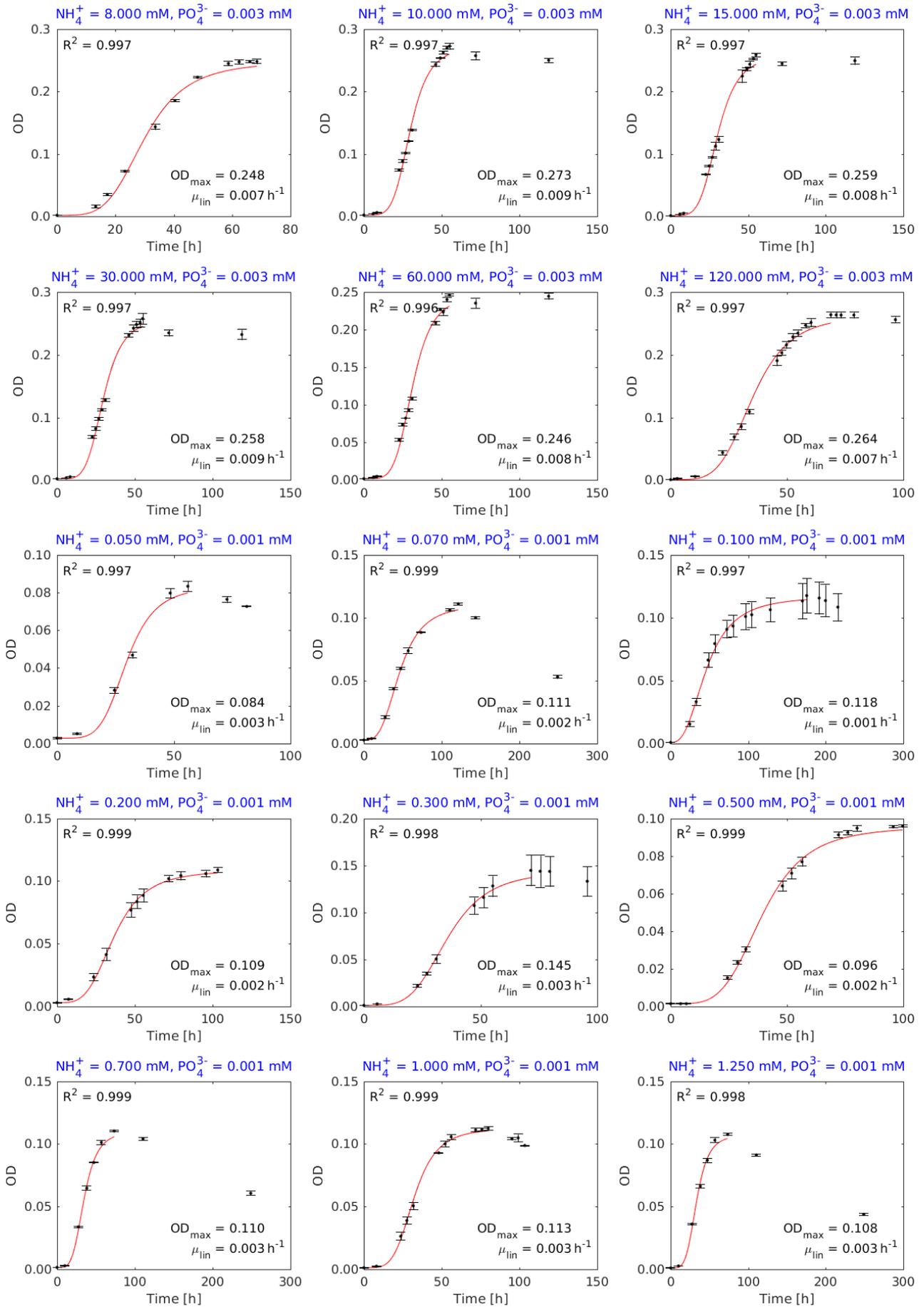












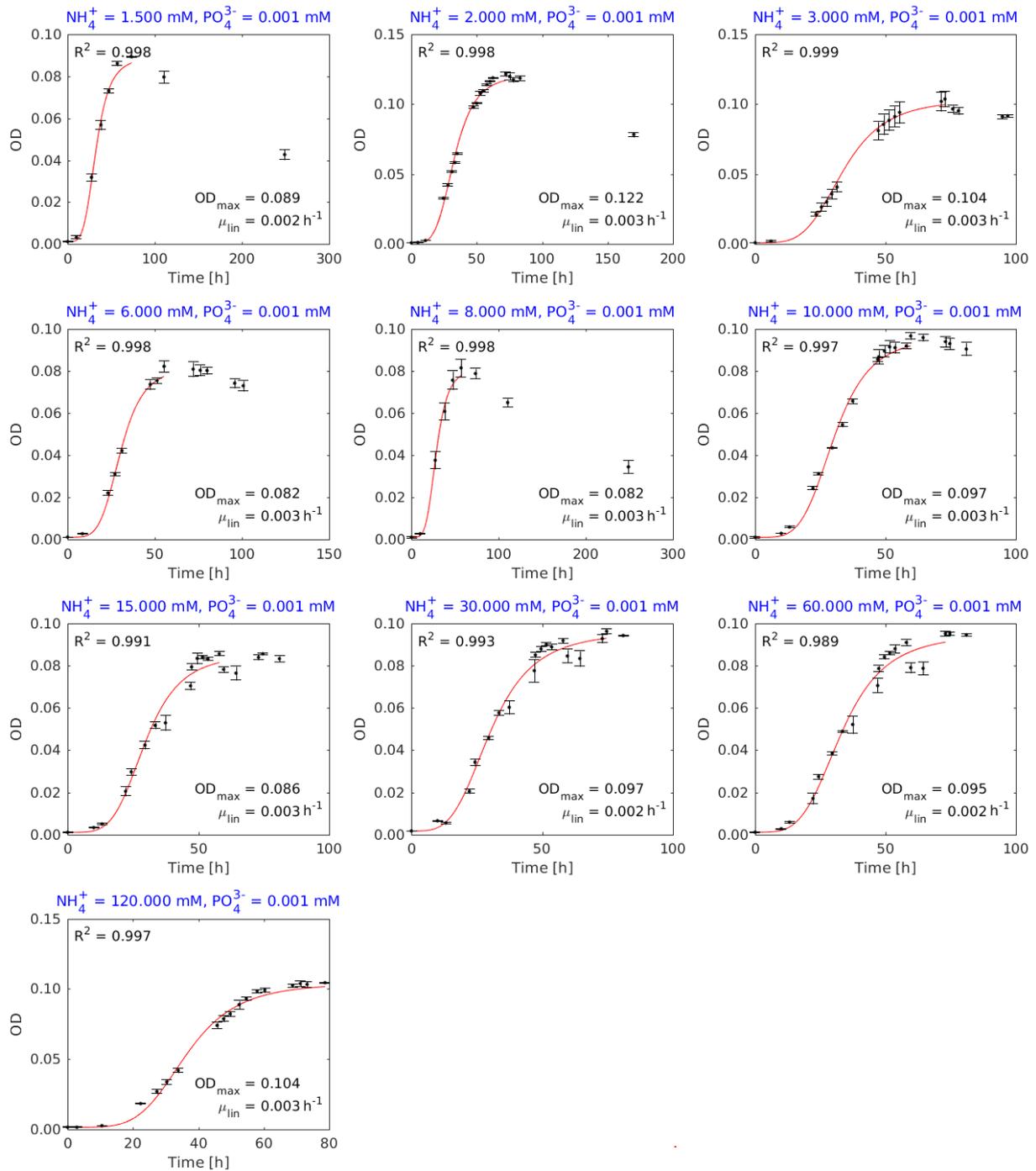


Figure S2 Compiled growth curves for *P. inhibens* DSM 17395 with fitted LDR function for 415 different NH_4^+ and PO_4^{3-} concentration pairs (data basis for Figs. 2–5). Each plot displays recorded experimental data for optical densities (OD) at 600 nm (black) and the fitted LDR function (red) with corresponding R^2 values, as well as the maximal OD (OD_{max} ; at the transition into stationary growth phase) and the calculated maximal linear growth rate (μ_{lin}) achieved during the main active growth phase.

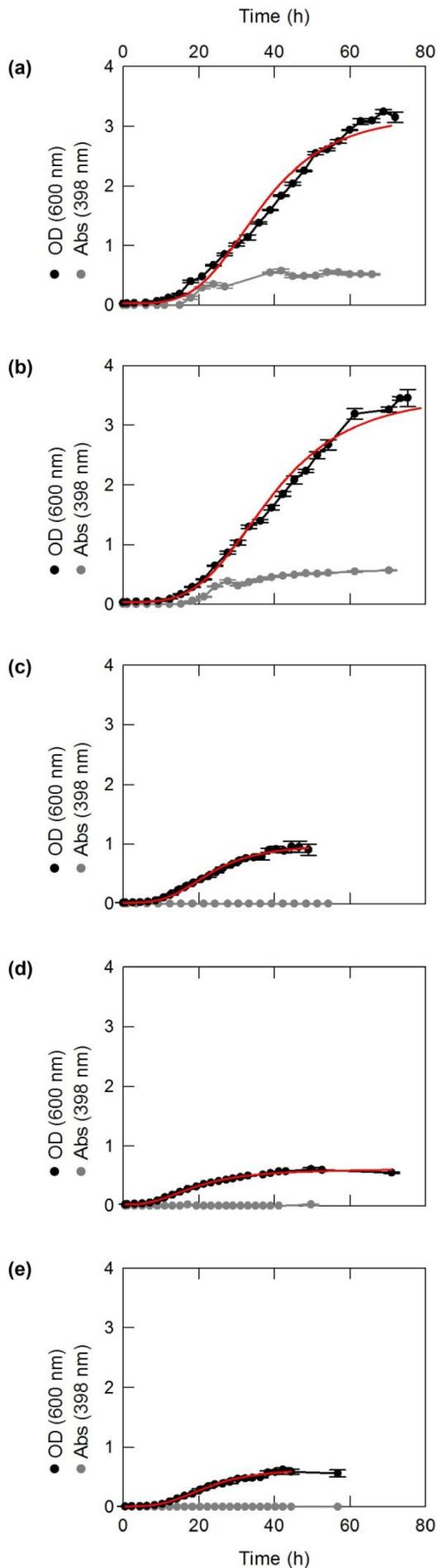


Figure S3 High-resolution growth curves of *P. inhibens* DSM 17395 with fitted LDR function (red line) for five selected NH_4^+ and PO_4^{3-} concentration pairs. Corresponding external N:P supply ratios were (values in brackets: NH_4^+ and PO_4^{3-} concentration pair): (a) 267 (8.0 mM, 30 μM), (b) 67 (2.0 mM, 30 μM), (c) 17 (0.5 mM, 30 μM), (d) 4 (0.5 mM, 125 μM) or (e) 1 (both 0.5 mM). An absorbance (Abs) increase at 398 nm indicates formation of the antibiotic tropodithietic acid (TDA).

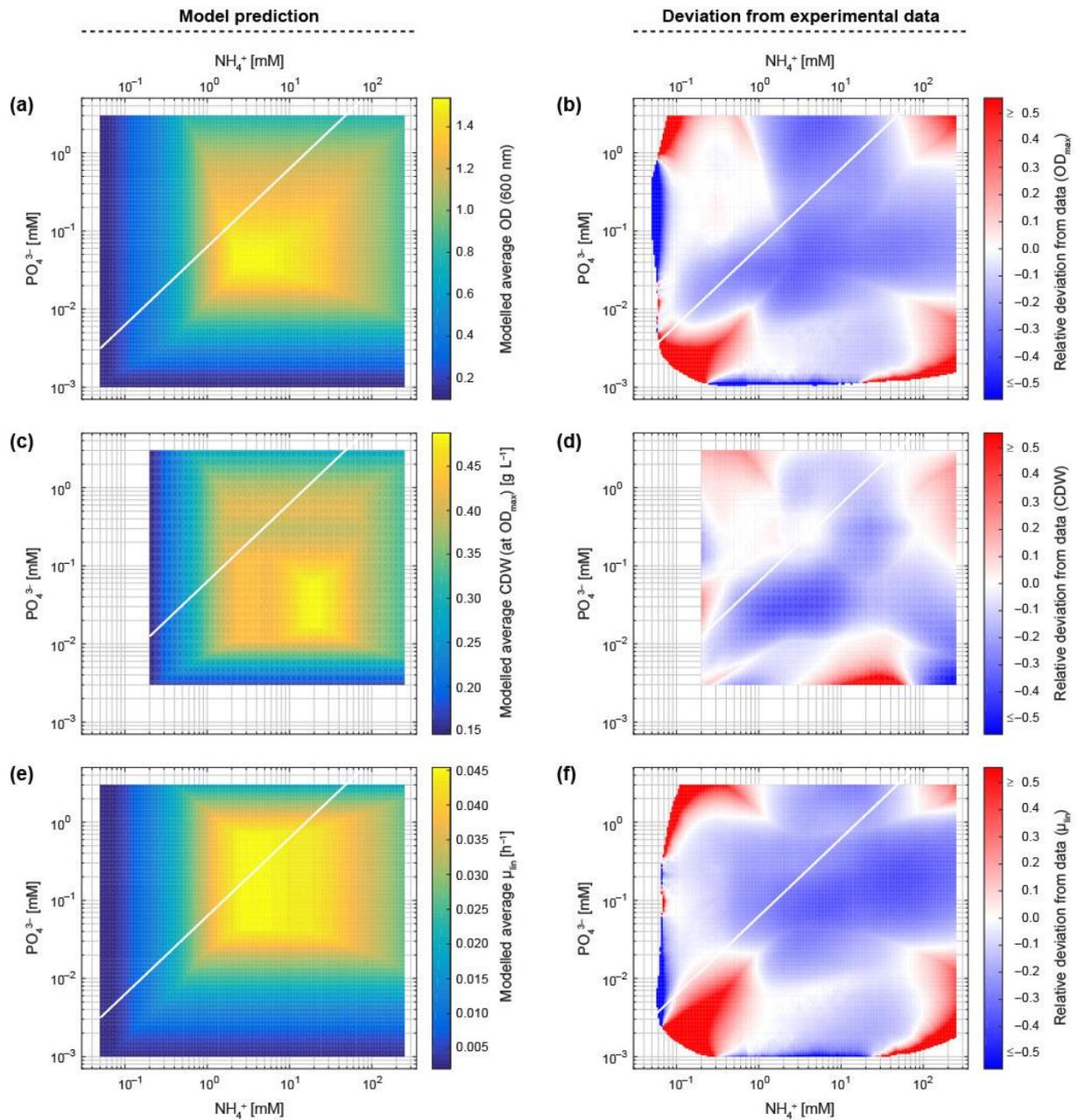


Figure S4 Comparison of experimental data with model prediction based on Liebig's law of the minimum. **(a, b)** maximal optical density (OD_{max}), **(c, d)** cellular dry weight (CDW) at OD_{max} , and **(e, f)** maximal linear growth rate (μ_{lin}) across the studied concentration range of NH_4^+ and PO_4^{3-} . **(a, c, e)** Values predicted by model based on Liebig's law of the minimum. **(b, d, f)** Relative deviation of model prediction from experimental values: red color, model prediction higher than experimental value; blue color, model prediction lower than experimental value; white, exact match between model prediction and experimental value.

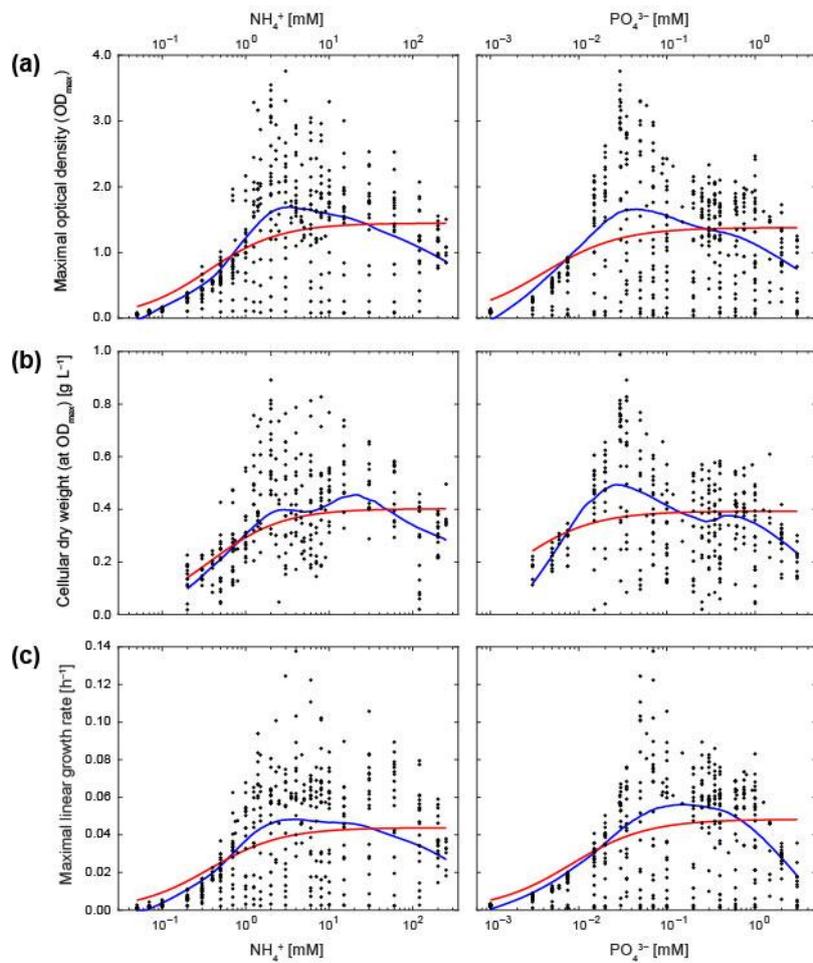


Figure S5 Experimental data (black dots) with fitted Monod function (red line). Semi-logarithmic profiles of (a) maximal optical density (OD_{max}), (b) cellular dry weight at OD_{max} , and (c) maximal linear growth rate (μ_{lin}) for *P. inhibens* DSM 17395 as a function of NH_4^+ or PO_4^{3-} concentration (see Fig. 2b–d for joint display in color maps). A Monod function was fitted to experimental data by minimizing the sum of squared errors. The blue line corresponds to the median derived from a 2D LOWESS fit to experimental data (see Fig. 3).