Model to fit standard/calibration curve relationship:

The simplest and traditionally most common approach to fit the calibration curve to the concentration (x) and detector response (y) for the standards is by ordinary linear regression using least squares calculation. This approach however requires homoscedastic data (i.e. constant variance across the calibration range) in order to get accurate and reproducible quantification. This is almost never the case for bio-analytical assays as they usually cover a broad concentration range and have a variance proportional to the concentration i.e. heteroscedastic data. Weighted regression (e.g. $1/\sqrt{x}$, $1/x$, $1/x^2$) or data transformations (e.g. log-log transformation) lead to a more homogenous distribution of the residuals for heteroscedastic data. The final choice of regression model will affect the reproducibility and the accuracy for both low and high concentrations.