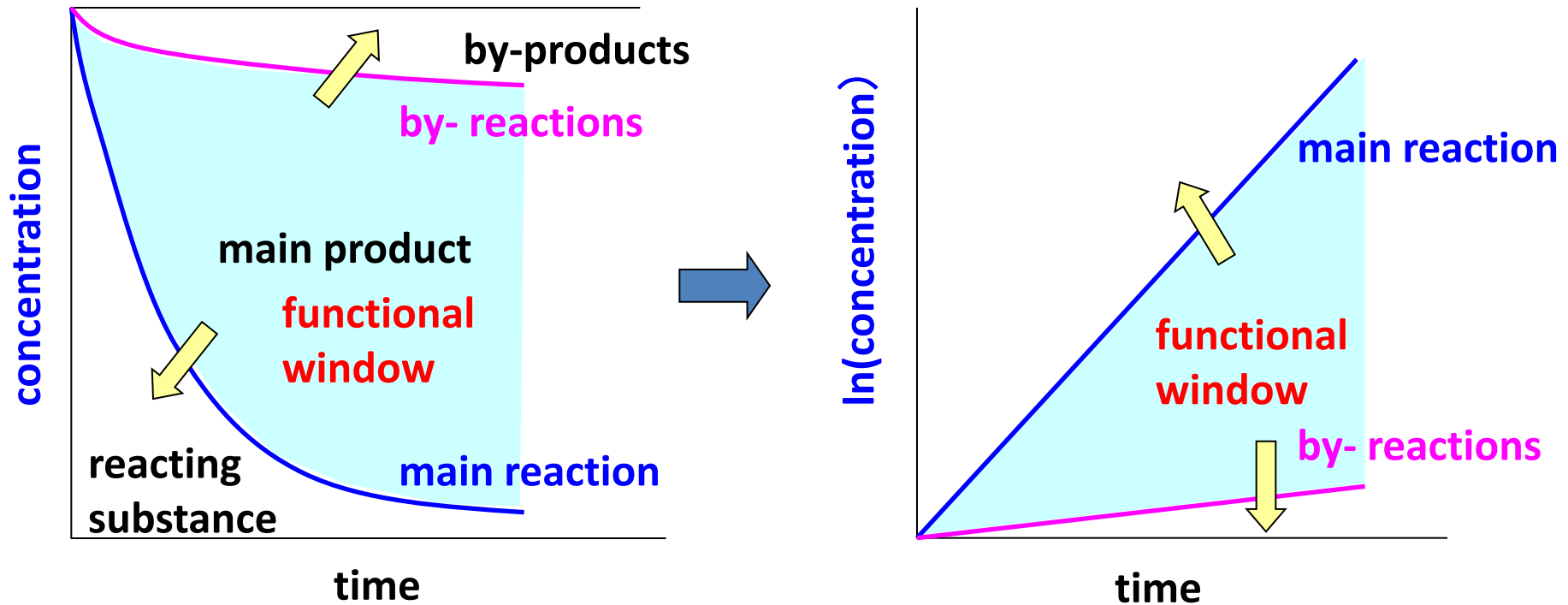


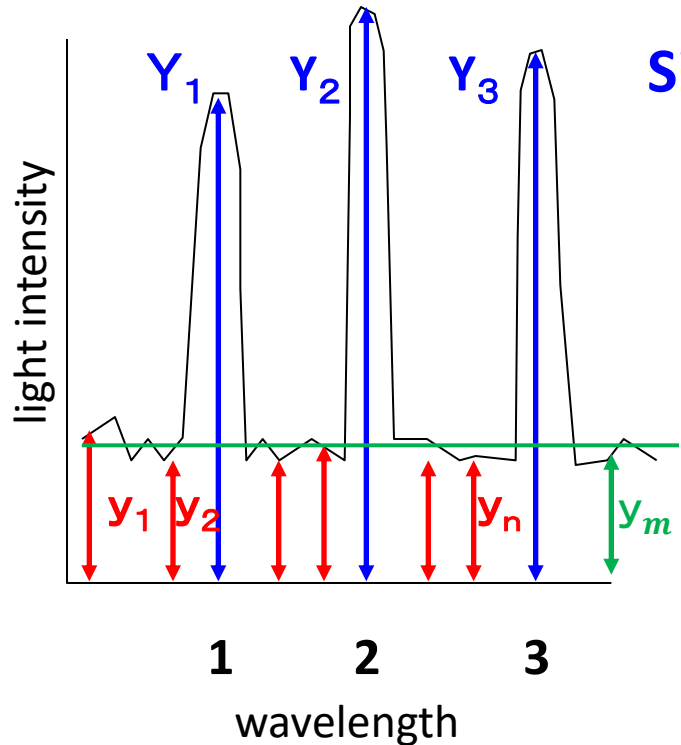
# Window method



- **By-products** correspond to **noise**. **Main product** corresponds to **signal**.
- **Main reaction** is as large as possible, **by-reactions** are as small as possible
- Make **functional windows** as wide as possible

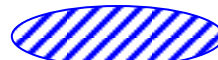
# Functional window

SN ratio has **additivity of factorial effects**



**Signal**

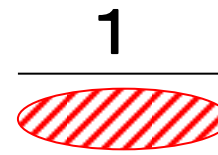
$$\eta_1 = 10 \log$$



+

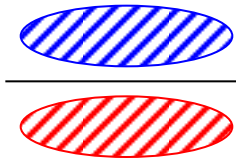
**Noise**

$$\eta_2 = 10 \log$$



$$\eta = \eta_1 + \eta_2$$

$$\eta = 10 \log$$



1

**smaller-is-better response: as possible as small**

$$y_m = \frac{y_1 + y_2 + \dots + y_n}{n}$$

$$S_T = y_1^2 + y_2^2 + \dots + y_n^2$$

$$V_T = \frac{S_T}{n}$$

$$\eta_2 = 10 \log \frac{1}{V_T}$$

$$S_T = Y_1^2 + Y_2^2 + \dots + Y_n^2$$

$$S_m = (Y_1 - y_m)^2 + (Y_2 - y_m)^2 \dots (Y_n - y_m)^2$$

$$\eta_1 = 10 \log \frac{\frac{1}{nr} (S_m - V_e)}{V_e}$$