

# Instructions for carrying out statistical procedures and tests using SPSS

These instructions are closely linked to the author's book:

**Essential Statistics for the Pharmaceutical Sciences**  
**John Wiley & Sons Ltd <http://eu.wiley.com>**  
**2007**  
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For all references to chapters or tables, see the above book.

**Using SPSS to perform a  
regression analysis**

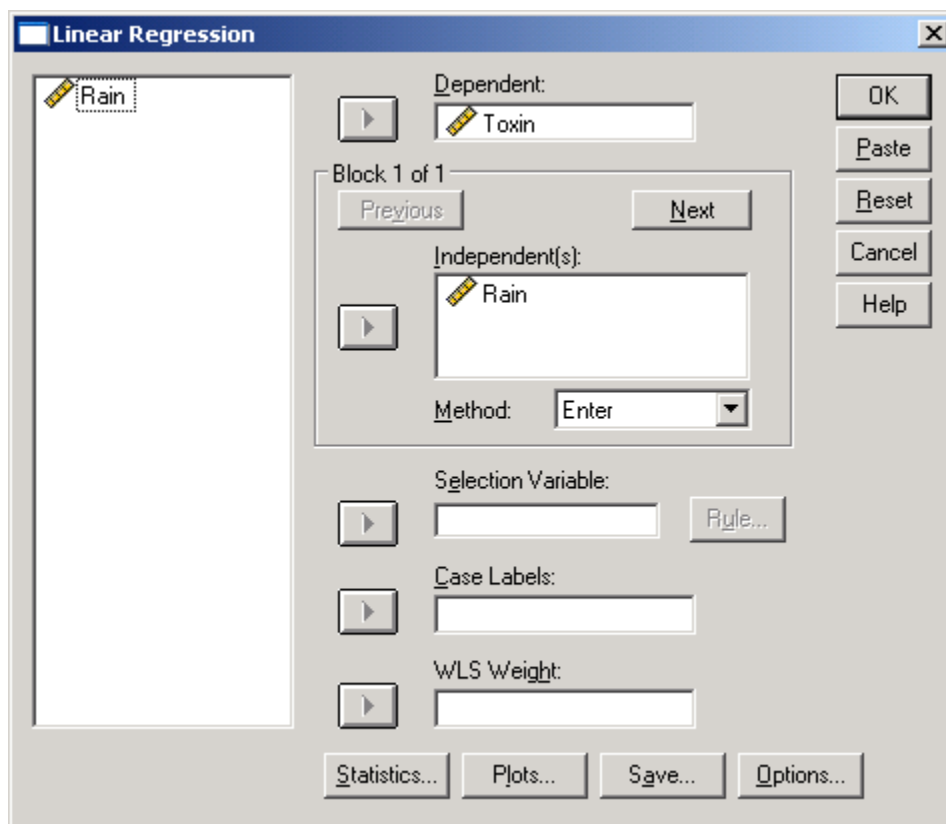
## Using SPSS to perform a regression analysis

**Example: Table 14.3 Rainfall at the growing site and concentration of fungal toxin in nuts.**

The rainfall and toxin data are entered into two appropriately labelled numeric columns. Then follow the menus:

*Analyze / Regression / Linear ...*

Move 'Toxin' into the 'Dependent' box and 'Rain' into the 'Independent(s)' box. It is absolutely vital that the variables are allocated correctly to these two boxes. The Linear Regression box should then appear as below:



The output will be as on the next page:

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.869(a)	.755	.724	2.1601

a Predictors: (Constant), Rain

### ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	114.842	1	114.842	24.613	.001(a)
	Residual	37.327	8	4.666		
	Total	152.169	9			

a Predictors: (Constant), Rain

b Dependent Variable: Toxin

### Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.570	1.961		5.390	.001
	Rain	6.726	1.356	.869	4.961	.001

a Dependent Variable: Toxin

Take the output tables in reverse order:

**The final table** (headed 'Coefficients') has a column headed 'B', which contains the intercept ('Constant') and gradient of the regression line (Highlighted yellow; 10.570 and 6.726 respectively). So, the regression equation is:

$$\text{Toxin} = 10.570 + 6.726 \times \text{Rain}$$

**In the middle table** (headed 'ANOVA'), the final column gives a test of significance for the regression equation. P is shown as 0.001, which is clearly significant.

**The first table** contains values for R-squared and R-squared (adjusted) which are measures of the closeness of the relationship between toxin concentration and rainfall. The values are 0.755 and 0.724 respectively. (See Section 14.2.5 for explanation).