

Figures, tables and graphs

Presenting scientific concepts and laboratory data in visual form can be challenging and requires careful preparation of material. We have produced some examples of what can and what shouldn't be done with visual tools such as figures, tables and graphs.

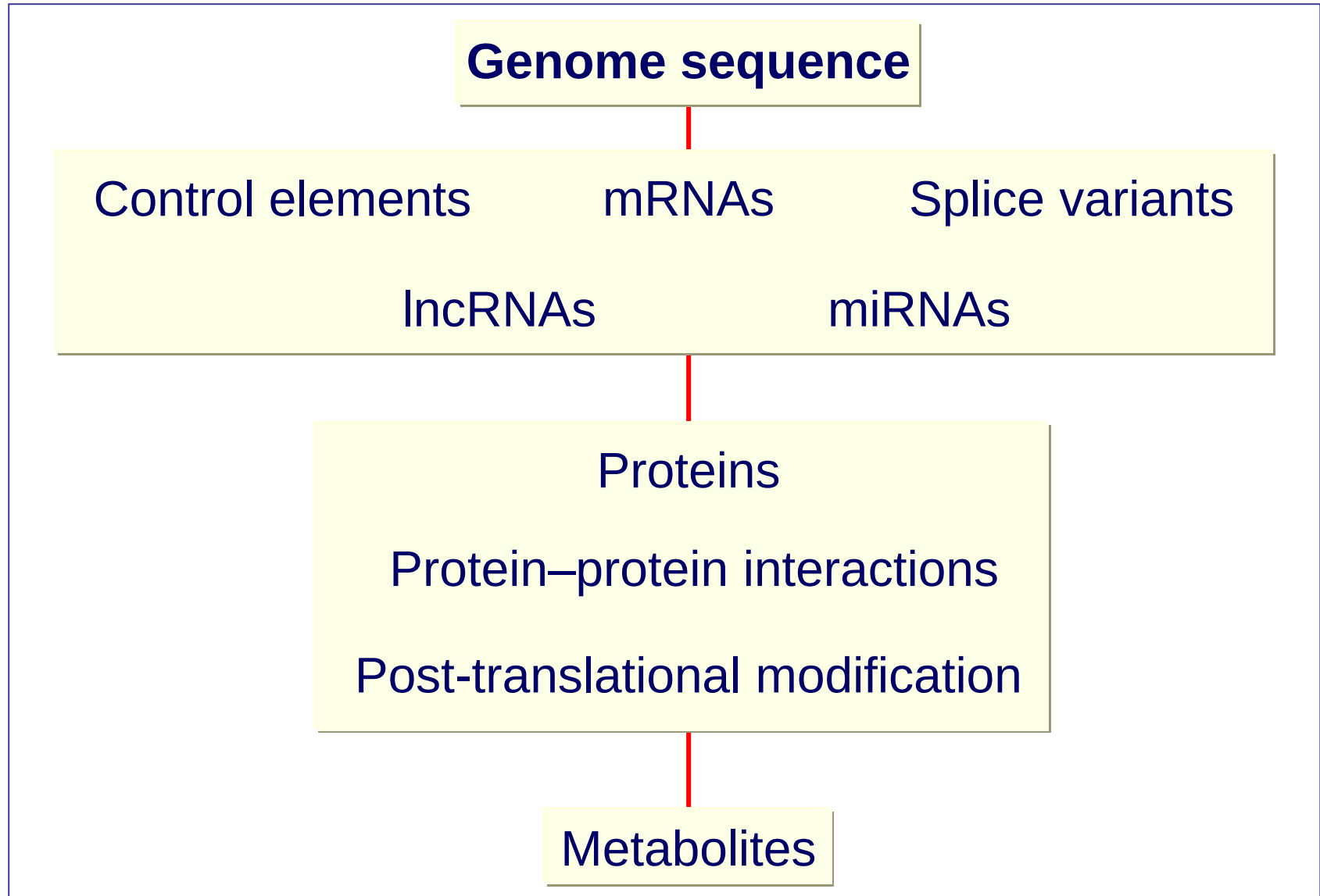
(1) Organising lists of information

A typical slide of information being presented as a long list of bullet points. This example lists the biological molecules that derive from the DNA sequence of the human genome.

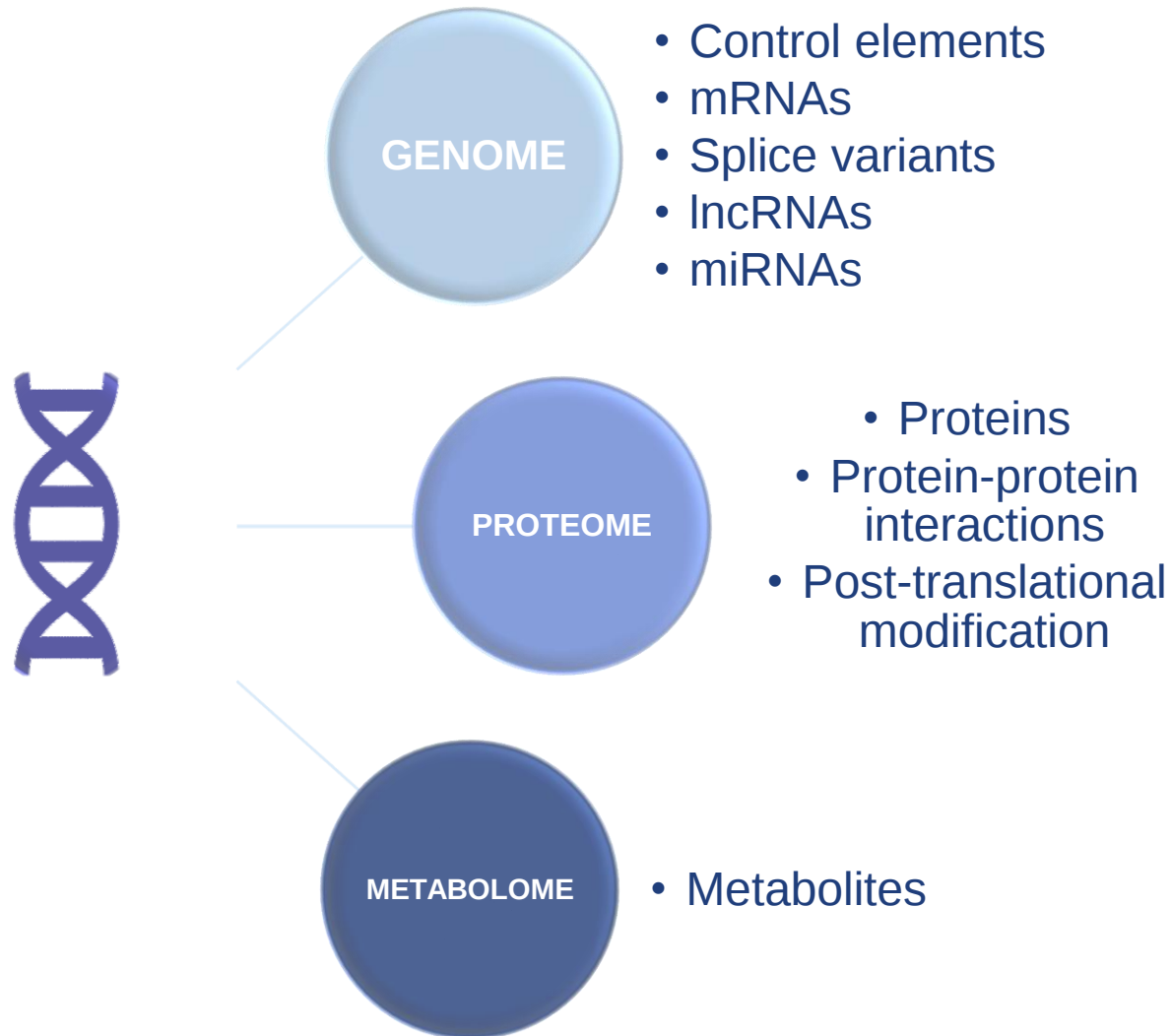
Genome sequence

- Control elements
- mRNAs
- Splice variants
- lncRNAs
- miRNAs
- Proteins
- Protein–protein interactions
- Post-translational modification
- Metabolites

Same items from previous slide displayed in biologically relevant groups that form a natural hierarchy. The information is now more rapidly digestible by the audience. The small shadow effect seen on the boxes can be used effectively for backgrounds to graphics or text.

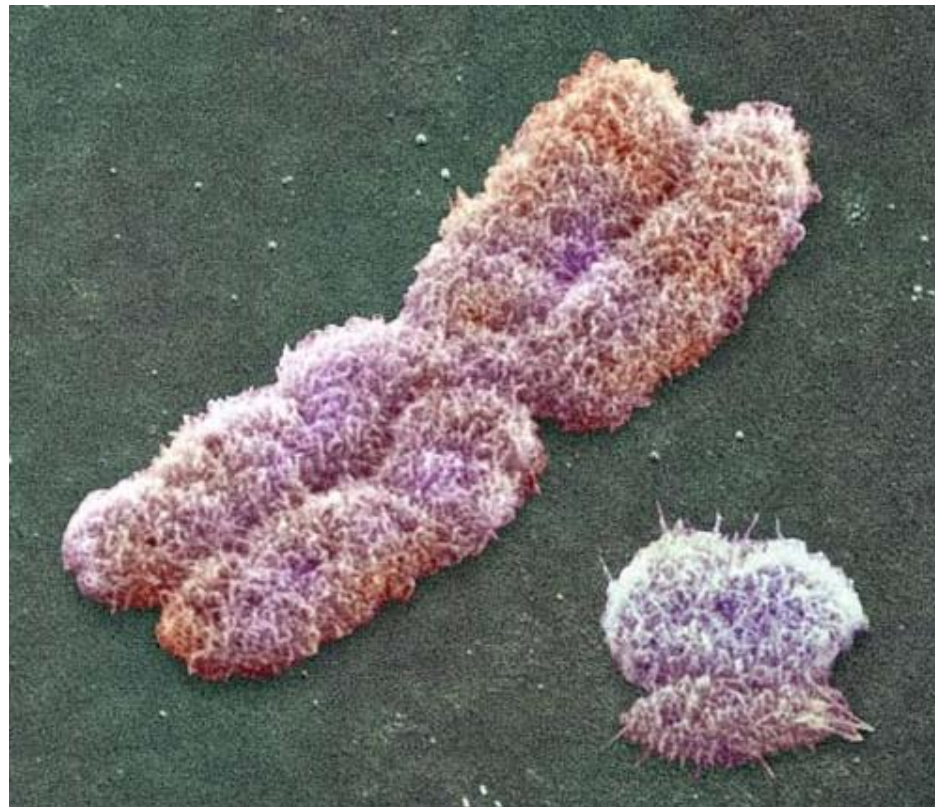


Items from previous two slides displayed in biologically relevant groups that form a natural hierarchy using the SmartArt facility in PowerPoint. This is just one of many options available in this feature for organising information into groups.



(2) Using a picture to make a point

Much scientific material (e.g. astronomical objects and medical images) has to be presented as a picture to make any sense to an audience. These images are an essential part of the talk, but sometimes a picture can be used to reinforce a point that could just be made verbally. The picture below shows an image of a human X and Y chromosome under the microscope. The striking difference in size between the small male Y chromosome and the pair of female X chromosomes can be used to illustrate the fact that male chromosomes carry fewer genes than those specifying females.



(3) Schematic diagrams

Diagrams are essential for illustrating models of scientific phenomena, and will be required for almost all presentations.

There is almost endless scope for creating diagrams in different colours and fills. However, the suggestions for correct use of colours and fonts found elsewhere on this DVD apply to diagrams and labels just as much as with text alone.

Labels and legends should be informative on their own, but not full of information that the speaker is able to provide verbally.

The following three slides contain a schematic diagram of a biological receptor embedded in a cell membrane. The size of the diagram on the slide has been reduced to accommodate several lines of descriptive text. In this case, almost all the text is superfluous to a knowledgeable audience and can be removed to allow room to expand the image.

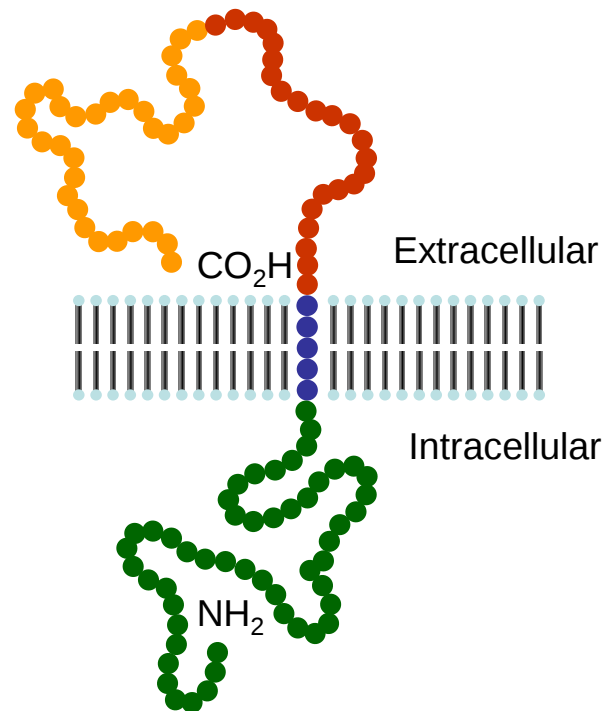
Schematic model of X-factor receptor

Expressed in yeast, drosophila and mammalian cells

Single chain 14 kD protein

Non-glycosylated

Cytoplasmic NH_2 terminus



Schematic model of X-factor receptor

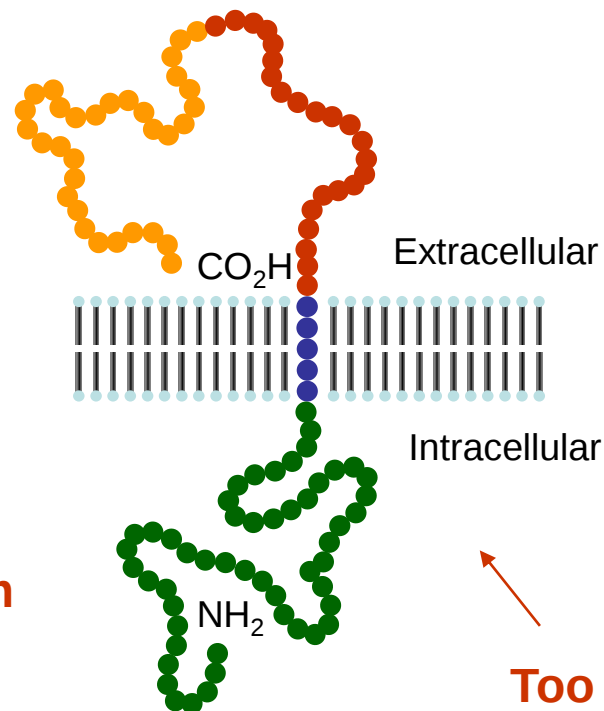
Expressed in yeast, drosophila and mammalian cells

Can be spoken

Single chain 14 kD protein

Non-glycosylated

Cytoplasmic NH₂ terminus



Self evident from diagram

Too small

Schematic model of X-factor receptor

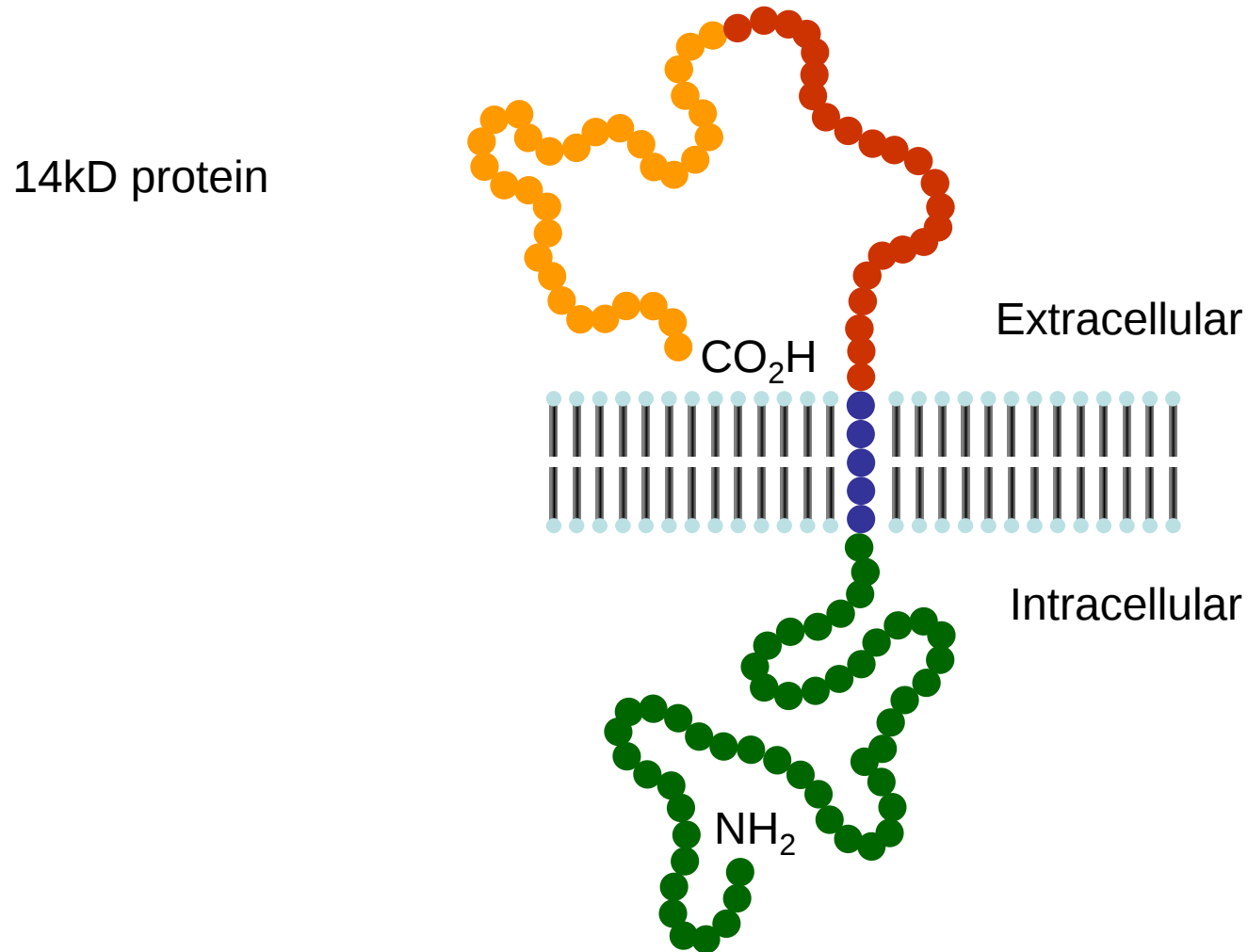


Diagram more prominent with minimal (relevant) text

(4) Tables

Tables can be very useful for displaying small amounts of information that can be absorbed rapidly by the audience.

Problems can arise when complex tables are taken from publications and used in presentations with little modification. In most cases it will be necessary to plot the data graphically using line charts, histograms, etc.

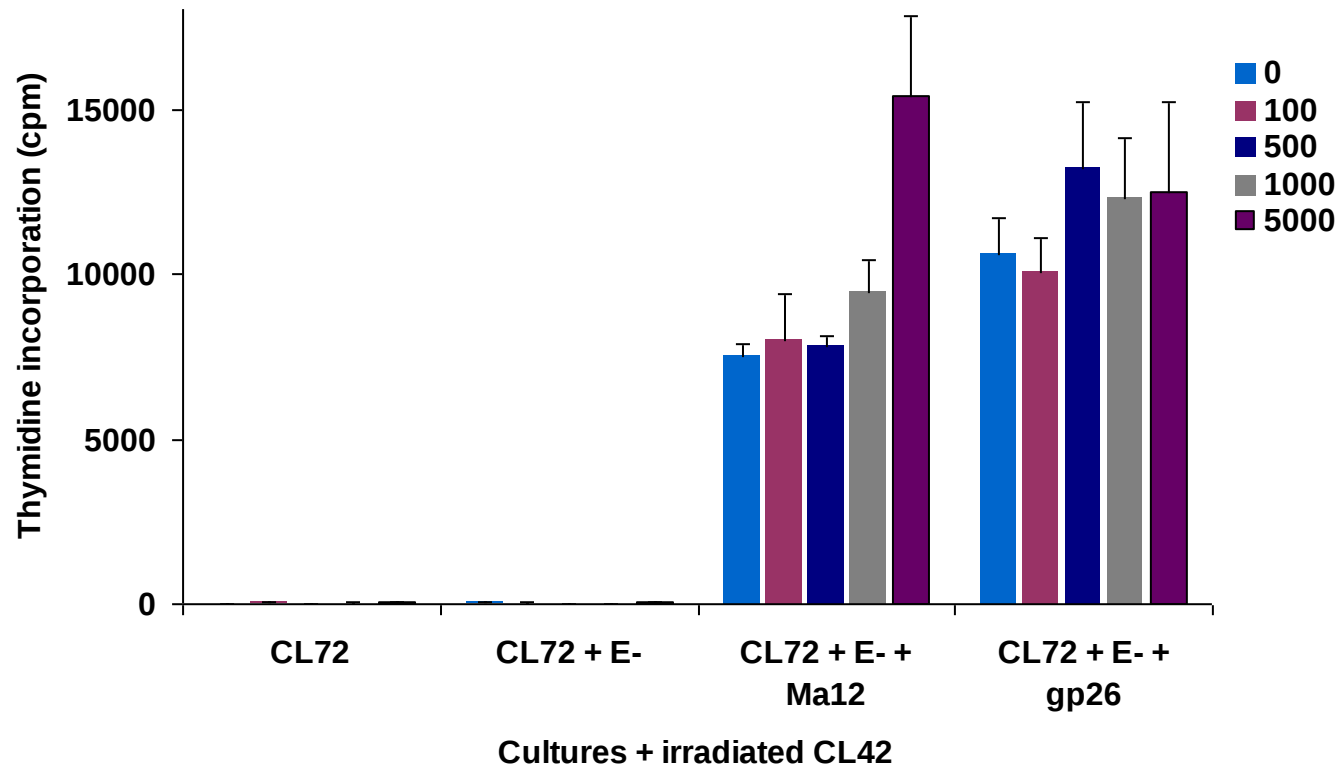
The following slides show a simple well-designed table, a complex table taken directly from a publication and finally the same data displayed in a bar chart.

Protein family	No. in human genome
PTPase	38
Nuclear receptors	48
Ion channels	200
GPCR (non-olfactory)	342
Kinases	518
Proteases	558

Simple clear table of data

	0	10^2	5×10^2	10^3	5×10^3
CL72	23 ± 1	45 ± 2	20 ± 4	28 ± 7	57 ± 4
CL72 + E-	75 ± 13	29 ± 8	21 ± 5	21 ± 1	37 ± 17
CL72 + E- + Ma12	7514 ± 343	7997 ± 1398	7789 ± 312	9432 ± 987	15421 ± 2412
CL72 + E- + gp26	10612 ± 1088	10054 ± 1052	13218 ± 1817	12322 ± 1817	12497 ± 2698

**Table copied directly from publication –
too small and too complex to evaluate quickly**



Same data on previous slide displayed in readily comprehensible form

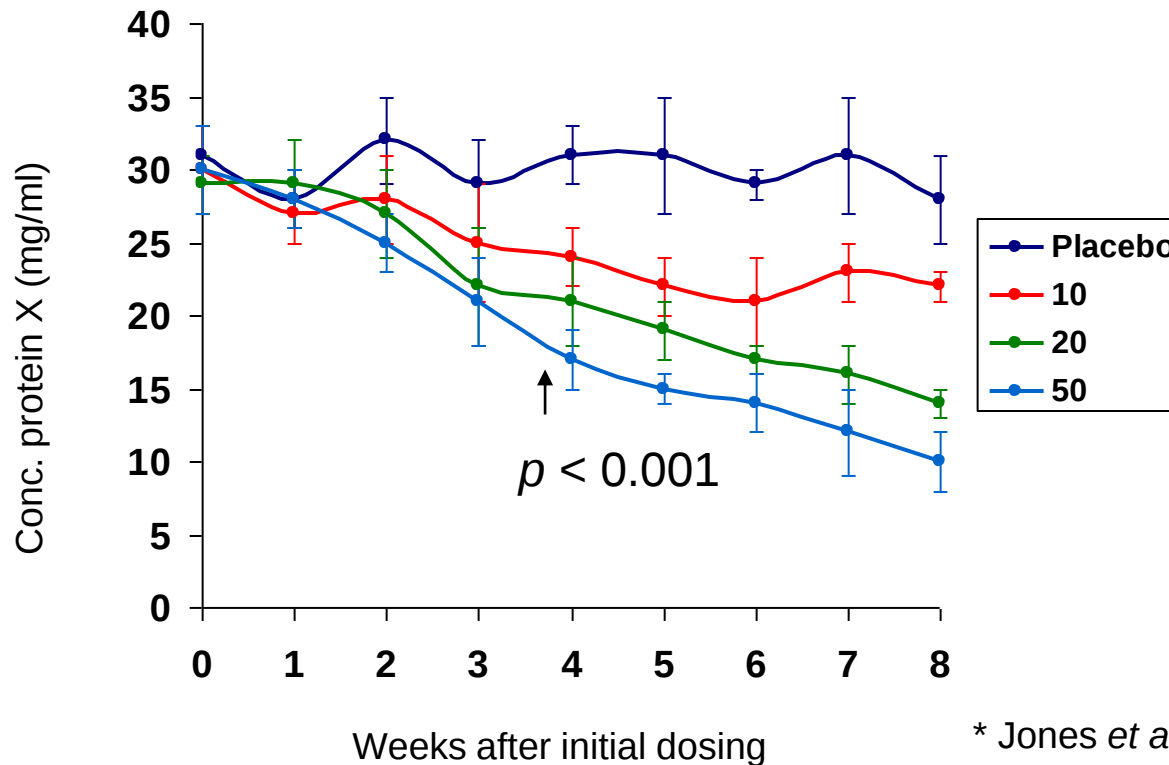
(5) Graphs

The same considerations of font size and colour for labelling schematic diagrams apply also to graphs.

The following slides illustrate the common problem of incorporating too much information on a single graph and how this can be remedied by sparing use of labels and legends.

It also illustrates the use of an appropriate title that summarises the results of the described experiment.

STARSTRUCK 900* azinthimin trial – surrogate marker validation in dactylitis cohort

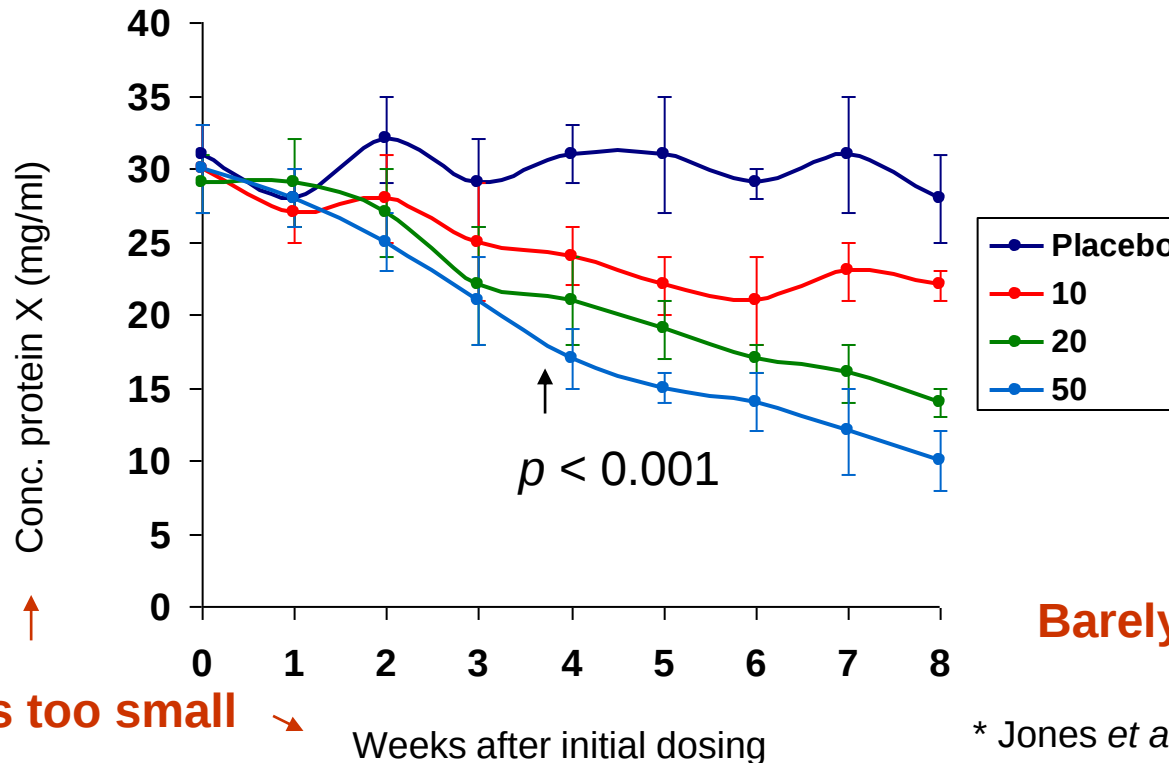


* Jones *et al.*, *Arthron* **3**, 34–40, 2007

- Reduction in protein X starts at 2 weeks on all doses of azinthimin
- Non-linear dose response between 20 and 50 mg/kg

Complex title that doesn't describe what is being displayed

STARSTRUCK 900* azinithimin trial – surrogate marker validation in dactylitis cohort



Axis labels too small

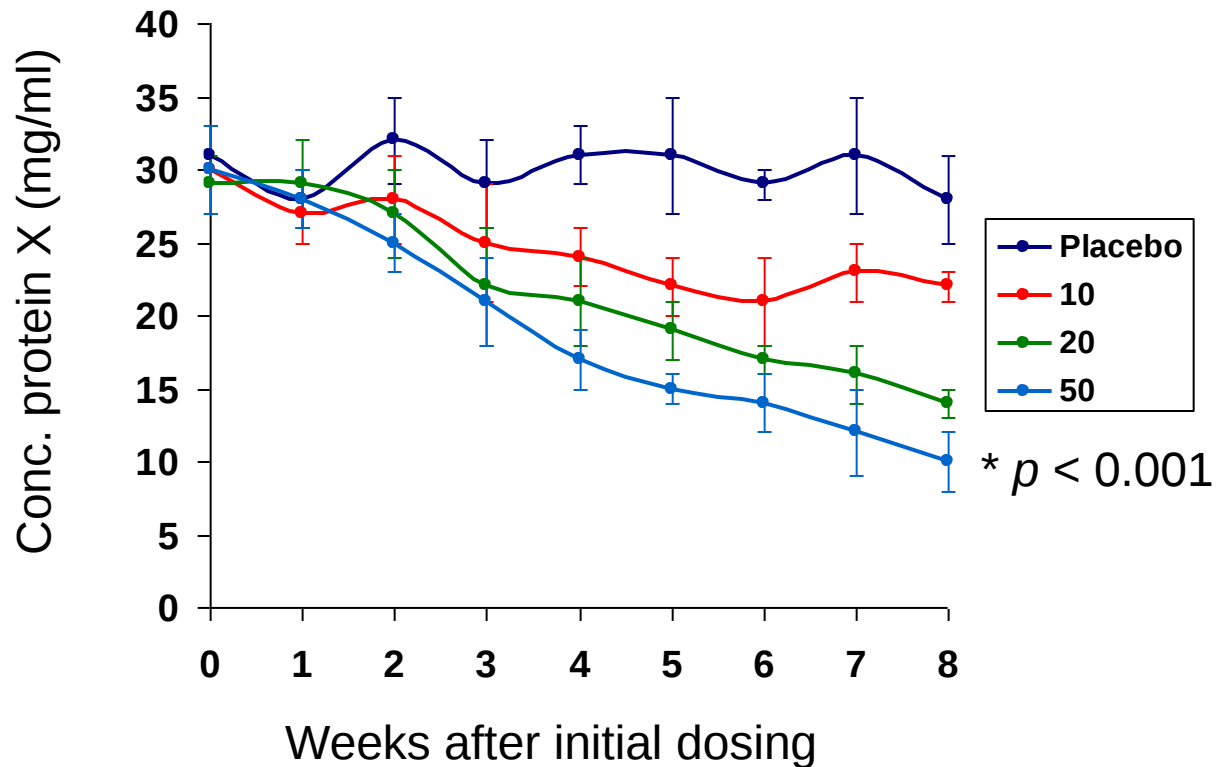
Barely legible reference

* Jones *et al.*, *Arthron* 3, 34–40, 2007

Unnecessary text

- Reduction in protein X starts at 2 weeks on all doses of azinithimin
- Non-linear dose response between 20 and 50 mg/kg

Treatment with azinthinin significantly reduces protein X in serum*



* Jones *et al.*, *Arthron* **3**, 34–40, 2007