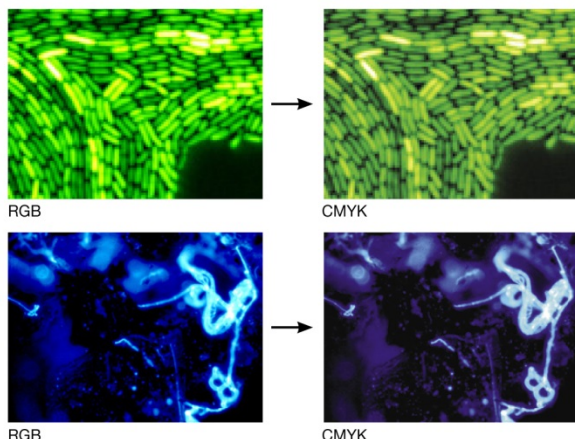


This guide is to assist authors whose manuscripts have been accepted for publication by Springer Nature. It will help you to prepare artwork so that it will be processed as quickly and smoothly as possible, and give the best possible results in the final printed version. When preparing figures, authors are also advised to refer to printed copies of the relevant journal to get a sense of general size and style points.

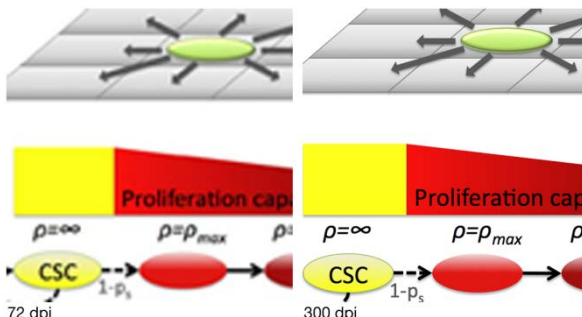
## Colours

- Full colour artwork should be provided in CMYK format to ensure you are happy with the conversion before submission of final artwork. The examples below show the shift in colour between RGB and the equivalent colour shown in CMYK - subtle details can be lost during conversion.



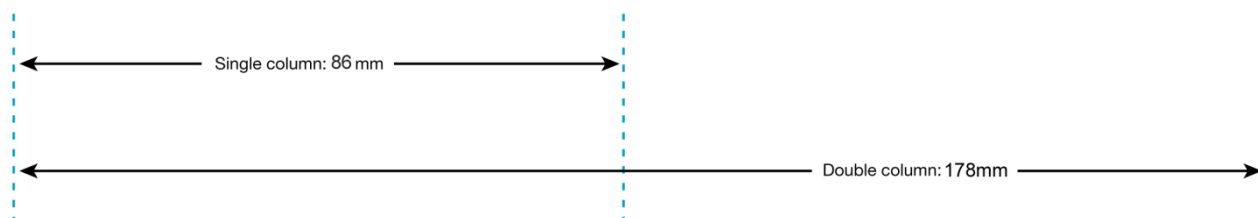
## Resolution

- All photographic images must be supplied at a minimum of 300 dpi at the maximum size they can be used
- Artificially increasing an image's resolution in an artwork program will not improve its quality
- The example below shows the difference between a low resolution image and the same image at 300 dpi (the differences are more apparent the further you zoom in)



## Figure sizing

- Provide files at about the size they are to be printed. Academic Journals standard figure sizes are 86mm (single column) and 178mm (double column). The full depth of the page is 210mm.



## Line weights

- Lines and strokes should be set between 0.25 and 1 pt
- Do not rasterize or outline these lines if possible

———— 0.25 pt      ————— 1 pt

## Formats

For publication, we prefer to use **TIFF** and **EPS** files in PC format, preferably from Photoshop or Illustrator software. We can also accept Freehand MX, Canvas and CorelDraw (version 8 and above), but these files **must be converted to encapsulated postscript (EPS) format**. For any figures submitted in Photoshop or TIFF format we require layered files to be sent whereby all text, arrows or additional attributes are placed on individual layers within the file. We can also accept Adobe PDF (output to print or press settings), native PowerPoint, Word and Excel files, provided that each figure element is editable (in these programs the elements should be 'ungrouped'). Please note however that these software packages **only allow RGB colour file creation** (not suitable for print production), and colour conversions from RGB to CMYK may have unpredictable results.

Ensure all placed or linked pictures are correctly embedded into your final figure files.

For **photographic type images**, Adobe Photoshop 6 is the minimum preferred format. If the image contains layers, please save your image in the native Photoshop format (**PSD**). If not, please save as a **TIFF** file. We also accept **JPEG** and **EPS**. The minimum acceptable resolution is **300 dpi**.

For **line art/charts/graphs** we prefer to work with Adobe Illustrator Creative Suite 6 (or above) format or Illustrator EPS files. We can also accept Freehand MX (but preferably only if converted to EPS or PDF), PostScript (up to Level 3), ChemDraw<sup>TM</sup> (apply settings as per the ACS-1996 style sheet) and TeX/LaTeX.

Please avoid outputting JPEGs from IBM/SPSS Statistics (any version) as output is automatically restricted to 96 DPI which is too low for print reproduction. Other **unacceptable** formats include: CorelDraw (prior to version 8), DeltaGraph and SigmaPlot.

### Colour images

For printing purposes, all RGB colours need to be converted to CMYK (cyan/magenta/yellow/black). You should be aware that this can make colours less vibrant and subtle details less apparent.

### Tables

Please submit tables in (editable) Word or Excel format at the end of your manuscript. Please avoid setting Table rows in picture format and then saving the document in Word. Please also ensure that you provide a 'flat' file, with single values in each cell with no macros or links to other workbooks or worksheets and no calculations or functions.

### Key Notes

- Colour, 300 dpi minimum; please convert all colour files into CMYK mode
- Greyscale, 600 dpi minimum for blots and black & white photographs
- Line art, 1000 dpi minimum for graphs and illustrations
- Please use sans serif typefaces such as Arial or Helvetica in your artwork and when labelling panels.
- Avoid layering type directly over shaded or textured areas.
- Please ensure that multilayered images are not 'flattened'.

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### Supplementary Information files

Graphic interchange format (.gif)	Adobe Acrobat files (.pdf)
Quick Time files (.mov)	MS Word documents (.docx)
HTML files (.html)	Postscript files (.ps)
MPEG movie files (.mpg)	Encapsulated postscript (.eps)
JPEG image files (.jpg)	MS Excel spreadsheet documents (.xlsx)
Sound files (.wav)	PowerPoint files (.pptx)
systems biology markup language (.sbml)	extensible markup language (.xml)

### File size and specifications

File sizes must be as small as possible, so that they can be downloaded quickly. The number of files should be limited to ten; single PDFs may be up to 30MB per file, with the maximum cumulative size of all files not exceeding 150 MB. Please seek advice from the editorial office before sending files larger than our maximum size to avoid delays in publication.

Images should not exceed **640 x 480 pixels** (9 x 6.8 inches at 72 pixels per inch) but we would recommend **480 x 360 pixels** as the maximum frame size for movies. We would also recommend a frame rate of **15 frames per second**. All supplementary information must have its own legend and must be referred to in the manuscript.