

COMMON BIOLOGICAL SOLUTIONS

i) Isotonic Salines:

Frog, 0.65% NaCl (w/v)
Mammal, 0.9% NaCl (w/v)

ii) Perfusion Fluids:

All masses given in the table to be made up to 1000cm³

Frog	Ringer	Locke	Tyrode
Sodium chloride	6.5g	9.0g	8.0g
Potassium chloride	0.14g	0.42g	0.2g
Calcium chloride (anhyd)	0.12g	0.24g	0.2g
Sodium hydrogen carbonate	0.2g	0.2g	1.0g
Sodium dihydrogen phosphate	0.01g	0.05g	0.05g
Magnesium chloride (anhyd)			0.1g

iii) Fixatives:

Bouin's Solution:	Saturated aqueous picric acid solution Formaldehyde solution (40%) Glacial acetic acid	75cm ³ 25cm ³ 5cm ³
Flemming's Solution:	1% aqueous chromium trioxide solution 2% aqueous osmic acid solution Glacial acetic acid (This solution does not keep well, make up as required)	15cm ³ 4cm ³ 1cm ³
Formol-saline:	0.9% aqueous sodium chloride solution formaldehyde solution (40%) (keep neutral by adding a few granules of calcium carbonate)	90cm ³ 10cm ³
Schaudinn's Solution:	Saturated aqueous mercuric chloride Ethanol (absolute) Glacial acetic acid	66cm ³ 33cm ³ 1cm ³

iv) Common Stains:

The examples given are common general purpose stains. This list is not intended to be complete and the usual literature sources can provide further examples and more details

Carbol Fuchsin:	Fuchsin (basic) Phenol crystals Ethanol, 95% Water, (deionised or distilled)	1g 5g 10c m ³ 100cm ³
The fuchsin is dissolved in the phenol by heating on a water bath and mixing well. Add the ethanol, stir, add the water, and filter. This solution should be dilluted with water (1:10) for use in Gram staining.		
Crystal Violet - Ammonium Oxalate:	Crystal Violet Ammonium oxalate Ethanol, 95% Water	2g 0.8g 20cm ³ to 100cm ³
Dissolve the dye in the alcohol, add the oxalate dissolved in a little water. mix well, and dilute to 100cm ³ with water.		

Haematoxylin, Ehrlich's:	Haematoxylin Ethanol, 95% Glycerol Glacial Acetic Acid Ammonium alum Water	2g 100cm ³ 100cm ³ 10cm ³ 3g 100cm ³
Dissolve the haematoxylin in the alcohol, add the glycerol and the acetic acid. Dissolve the ammonium alum in the water, and add this solution to the other and mix well. The mixture should be left to oxidise in an unstoppered plain glass bottle for some weeks, but the oxidation period can be reduced by adding 0.4g of sodium periodate.		
Iodine, Gram's:	Iodine Potassium Iodide Water	1g 2g 300cm ³
Iodine, Lugol's:	As for Grams iodine but using only 100cm ³ of water.	
Leishman's stain:	Leishman stain Methanol	0.15g 100cm ³
Add the stain to the methanol and mix well. Allow to stand with occasional shaking, for at least 24 hours, and then filter.		
Methylene Blue, Loeffler's:	Methylene blue, saturated ethanolic solution Potassium hydroxide Water	30cm ³ 0.01g 100cm ³
Eosin:	1% aqueous solution, or 1% in 20% ethanol	

v) Botanical Materials:

Plant Preserving Media (a)	95% ethanol Water Formaldehyde (40%) Glacial Acetic Add	60cm ³ 40cm ³ 4cm ³ 4cm ³
(b)	95% ethanol Water Formaldehyde (40%) Cupnc sulphate crystals	36cm ³ 60cm ³ 4cm ³ 0.2g
Stains		
Fast Green FCF:	Methyl Cellosolve Ethanol (absolute) Clove Oil FCF Powder	30cm ³ 30cm ³ 30cm ³ 0.45g
Light Green SF:	Light Green powder Clove Oil	1.0g 100cm ³
The mixture should be heated on a boiling water bath until apparently dissolved, allowed to cool, and then filtered.		
Safranin:	SafraninO Ethanol, 70%	1.0g 100cm ³
Preparation of root tips for nuclear staining (a)	Clarks Fluid Glacial Acetic acid Ethanol	 25cm ³ 75cm ³
(b)	Orcein-acetic stain Stock Solution 2.2g Orcein dissolved and made up to 100cm ³ with a 45% v/v solution of acetic acid in water. Working solution(made just when required) Stock solution Water	 10cm ³ 12cm ³

vi) Some Useful Solutions:

Knops solution for algae culture	MgSO ₄ .7H ₂ O K ₂ HPO ₄ KNO ₃ Ca(NO ₃) ₂ Water to 1 litre	0.1g 0.2g 1.0g 0.1g
Chalkey's solution for amoeba culture		
Stock Solution	NaCl KCl CaCl ₂ Water to 500cm ³	10g 0.4g 0.6g
Working Solution	Take 1ml of stock solution and dilute to 200cm ³ with water. Add 2 wheat grains to every 25cm ³ required, boil, cool, and adjust to 5.8-6.0 if necessary, by adding dilute HCl.	
Dilutents for blood counting		
Turks Solution for WBC (Leucocytes)	Add a trace of gentian violet to 100cm ³ of 1% v/v acetic acid in water.	
Torissons solution for RBC (Erthrocytes)	To 160cm ³ of water add 1g sodium chloride, 8g sodium sulphate, and 30cm ³ glycerol.	
Bicarbonate Indicator		
Stock Solution	Prepare a solution of 0.02g Thymol blue and 0.01g Cresol red in 2cm ³ ethanol, and a solution of 0.084g NaHCO ₃ and 7.48g KCl in 90cm ³ water, and mix the two solutions.	
Working Solution	Add 1ml of the stock solution to 10cm ³ of water.	