

## Williams' medium E (liquid medium)

The medium was formulated to support long-term cell culture of adult liver epithelial cells. It is a modified MEM medium with altered glucose and amino acid content.

Product	Cat. No.	Unit
<b>Williams' medium E (liquid medium)</b> with 2.2 g/l NaHCO <sub>3</sub> , without L-glutamine Storage temperature: +2 – +8 °C	F 1115	500 ml
<b>Williams' medium E (liquid medium) without phenol red</b> with 2.2 g/l NaHCO <sub>3</sub> , without L-glutamine Storage temperature: +2 – +8 °C	F 1125	500 ml

### Formulation

Different from the original formulation, only 0.05 mg/l riboflavin is used to avoid negative photo oxidative effects.

Tab. 34: Composition of the William's medium E

Substance	Concentration (mg/l)	Substance	Concentration (mg/l)
NaCl	6800	L-methionine	15
KCl	400	L-phenylalanine	25
NaH <sub>2</sub> PO <sub>4</sub> ·2H <sub>2</sub> O	158.3	L-proline	30
MgSO <sub>4</sub> ·7H <sub>2</sub> O	200	L-serine	10
CaCl <sub>2</sub> ·2H <sub>2</sub> O	264.9	L-threonine	40
Na-pyruvate	25	L-tryptophane	10
D-glucose	2000	L-tyrosine	35
Phenol red	10	L-valine	50
NaHCO <sub>3</sub>	2200	Glutathion	0.05
CuSO <sub>4</sub> ·5H <sub>2</sub> O	0.00009	L-ascorbic acid	2
Fe(NO <sub>3</sub> ) <sub>3</sub> ·9H <sub>2</sub> O	0.0001	Biotin	0.5
MnCl <sub>2</sub> ·4H <sub>2</sub> O	0.0001	Calciferol	1
ZnSO <sub>4</sub> ·7H <sub>2</sub> O	0.0002	D-Ca-pantothenate	1
L-alanine	90	Cholin chloride	1.5
L-arginine-HCl	60.5	Folic acid	1
L-asparagine·H <sub>2</sub> O	20	Myo-inositol	2
L-aspartic acid	30	Menadione·NaHSO <sub>3</sub> ·3H <sub>2</sub> O	0.01
L-cysteine	40	Nicotinamide	1
L-cystine	20	Pyridoxal-HCl	1
L-glutamine	292	Riboflavin	0.1
L-glutamic acid	50	Thiamine×HCl	1
Glycine	50	DL-a-tocopherolphosphate·Na <sub>2</sub>	0.01
L-histidine·HCl·H <sub>2</sub> O	20.3	Vitamin A acetate	0.1
L-isoleucine	50	Vitamin B <sub>12</sub>	0.2
L-leucine	75	Methyl-inolate	0.03
L-lysine·HCl	87.5		

### Reference:

Williams, G.M., Weisburger, E.K. and Weisburger, J.H.; *Exptl. Cell Res.* **69**, 106 [1971]