

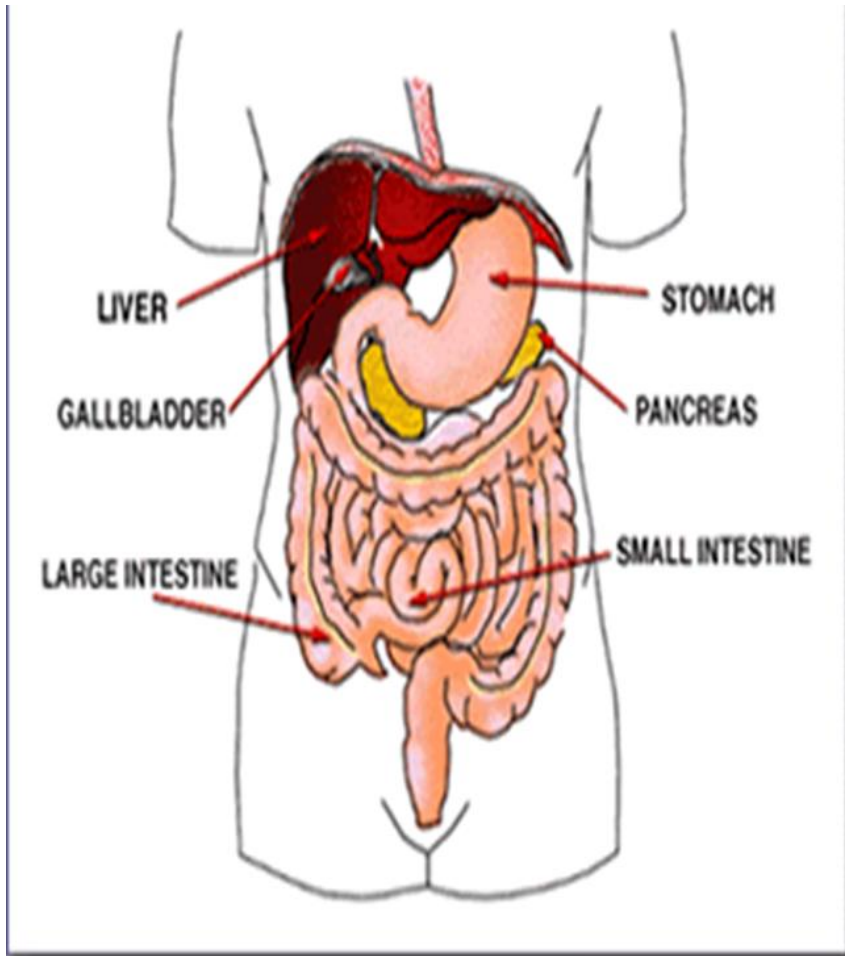
Understand Your Liver Blood Tests

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Hep B Peer Support Group

What the liver does 肝臟有什麼作用

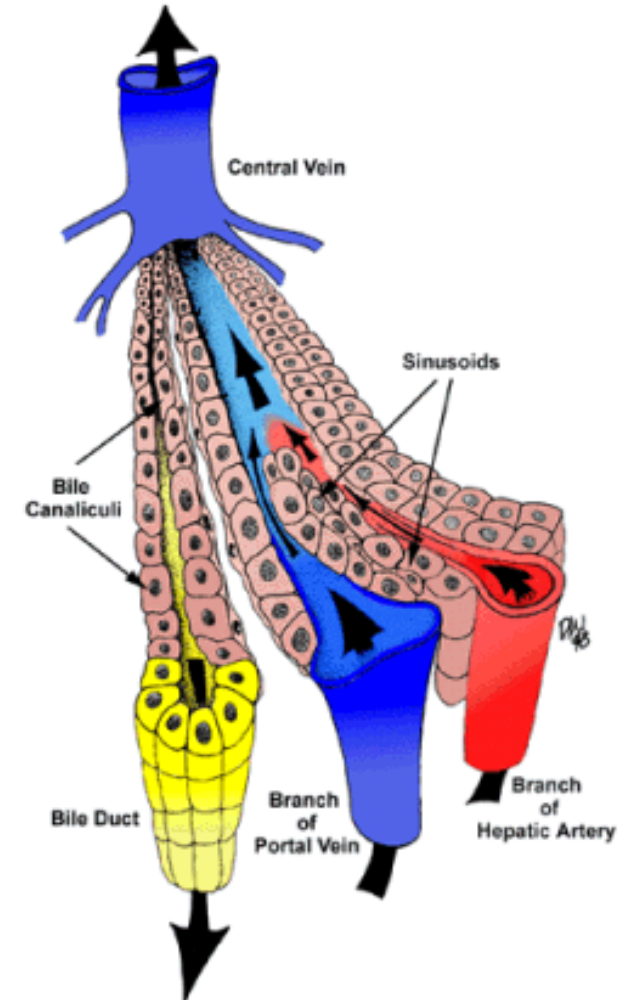
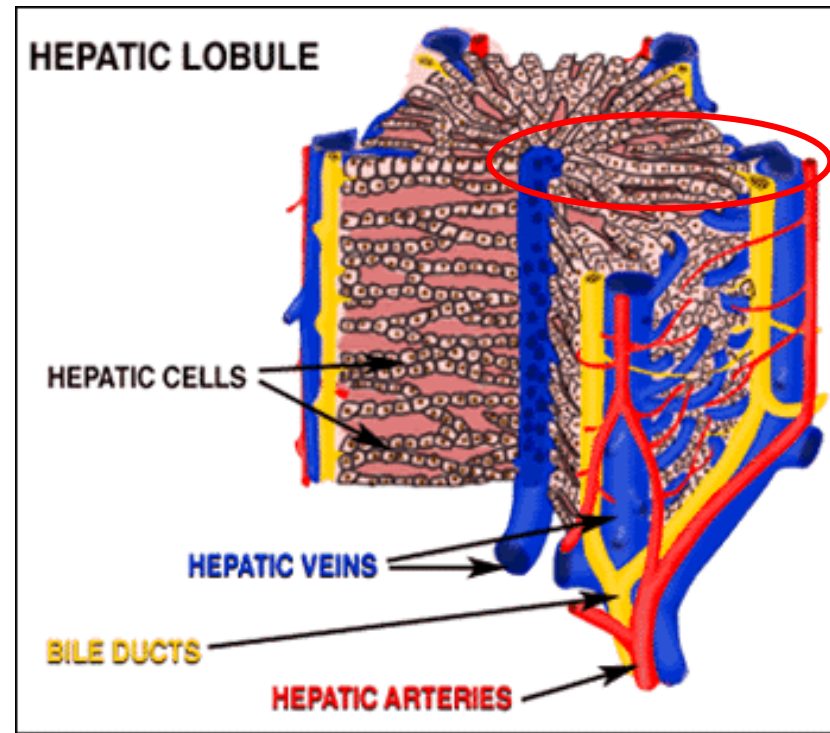
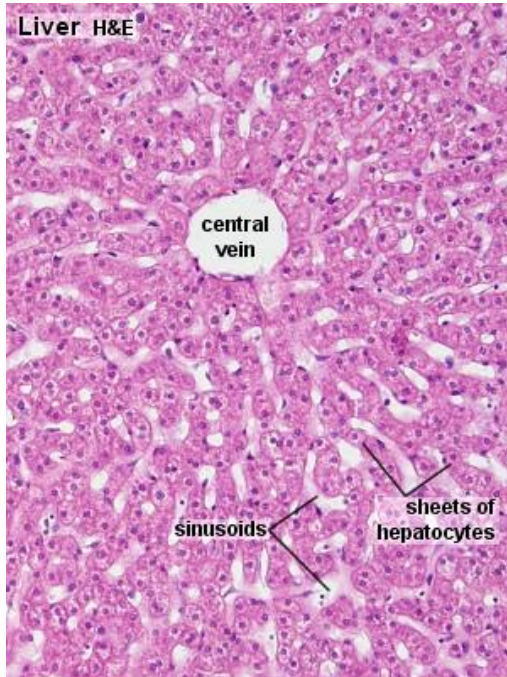


- Production: albumin, clotting factor, bile
製造: 蛋白質, 血凝因數, 膽汁
- Metabolize: nutrients, toxins
分解: 營養物質, 毒素
- Storage: glycogen, vitamins
儲存: 糖原, 維生素
- Elimination: bilirubin 排除: 膽紅素

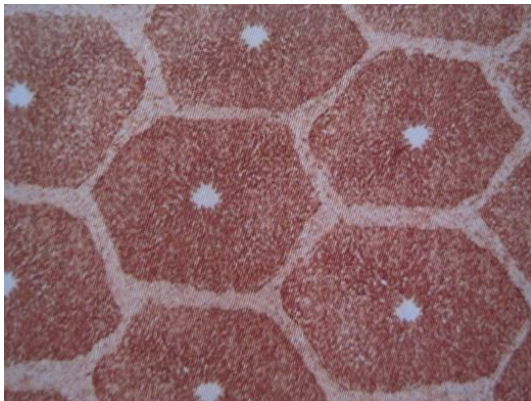
Liver Enzymes 肝酵素

- ALT (Alanine Aminotransferase) 谷丙轉氨酶
- AST (Aspartate Aminotransferase) 天冬氨酸轉氨酶
- ALP (Alkaline Phosphatase) 鹼性磷酸酶
- GGT (Gamma-glutamyl Transferase) γ -谷氨酰轉移酶

Normal Liver Histology 肝臟組織



肝小葉



Liver Enzymes 肝酵素

- ALT (Alanine Aminotransferase) 谷丙轉氨酶
 - $N \leq 40$ U/L
 - Specific to the liver
 - Small amount in skeletal muscle
- AST (Aspartate Aminotransferase) 天冬氨酸轉氨酶
 - $N \leq 35$ U/L
 - Also present in heart & skeletal muscle, kidneys

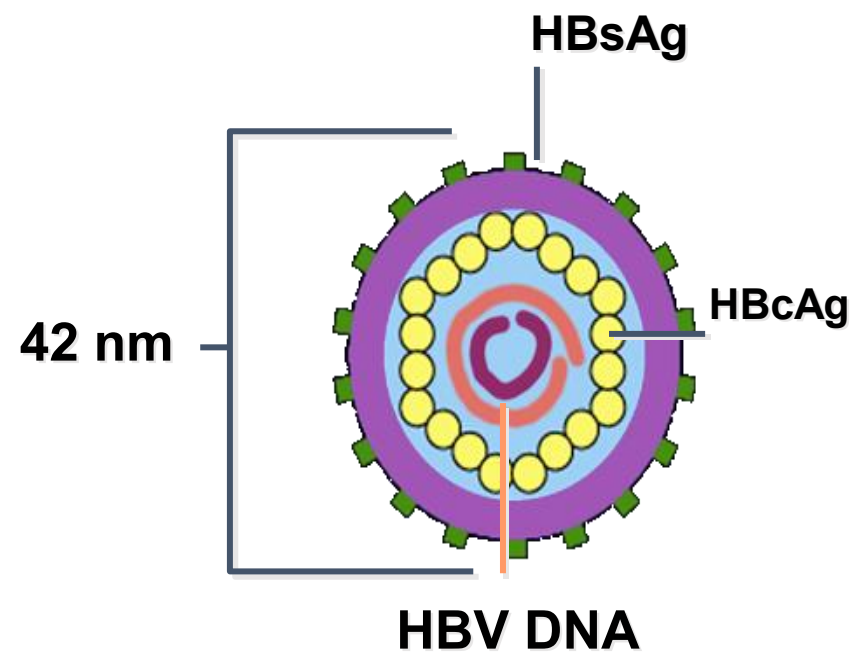
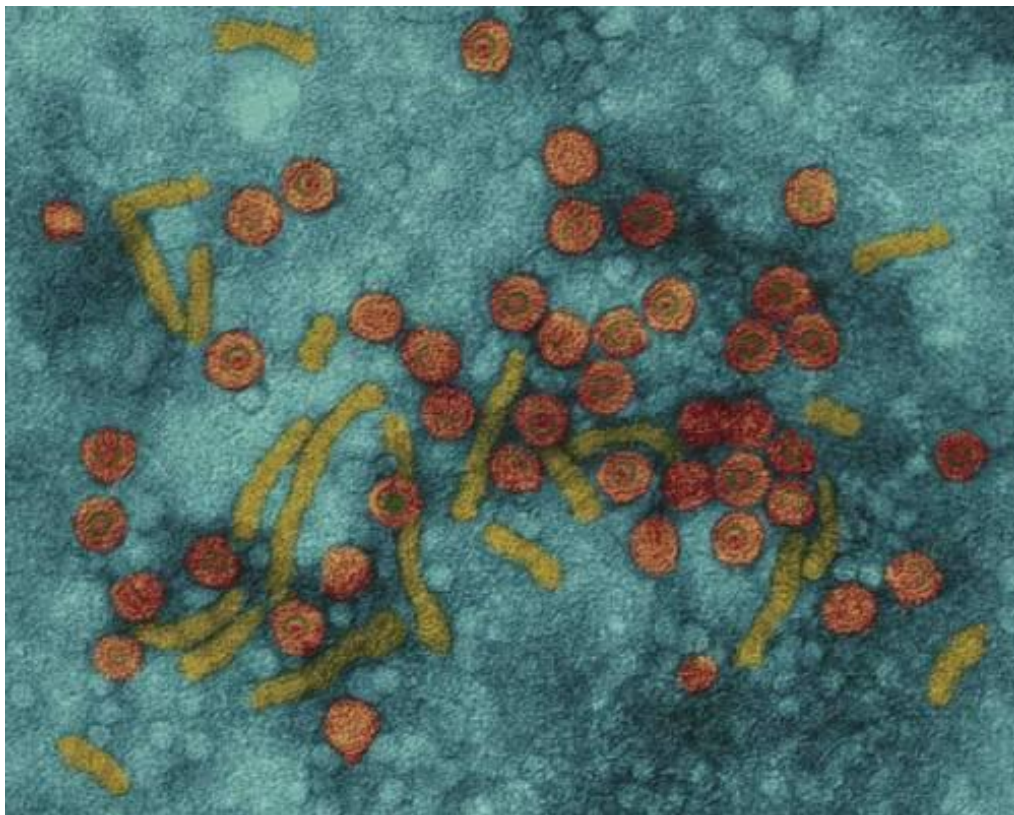
Liver Enzymes 肝酵素

- ALP (Alkaline Phosphatase) 鹼性磷酸酶
 - Obstructed biliary system
 - Also present in bone, placenta, bowel
- GGT (Gamma-glutamyl Transferase) γ -谷氨酰轉移酶
 - Go hand in hand with ALP if related to the liver
 - Isolated increase related to alcohol, drugs

Liver Function Tests 肝功能檢查

- Bilirubin 膽紅素 $< 18 \text{ mol/L}$ ( if function is impaired)
- Albumin 白蛋白 $> 38 \text{ g/L}$ ()
- INR 國際標準化比值 (血液凝固) < 1.2 ()
- (Platelets) 血小板 $150\text{-}400 \times 10^9/\text{L}$ ()

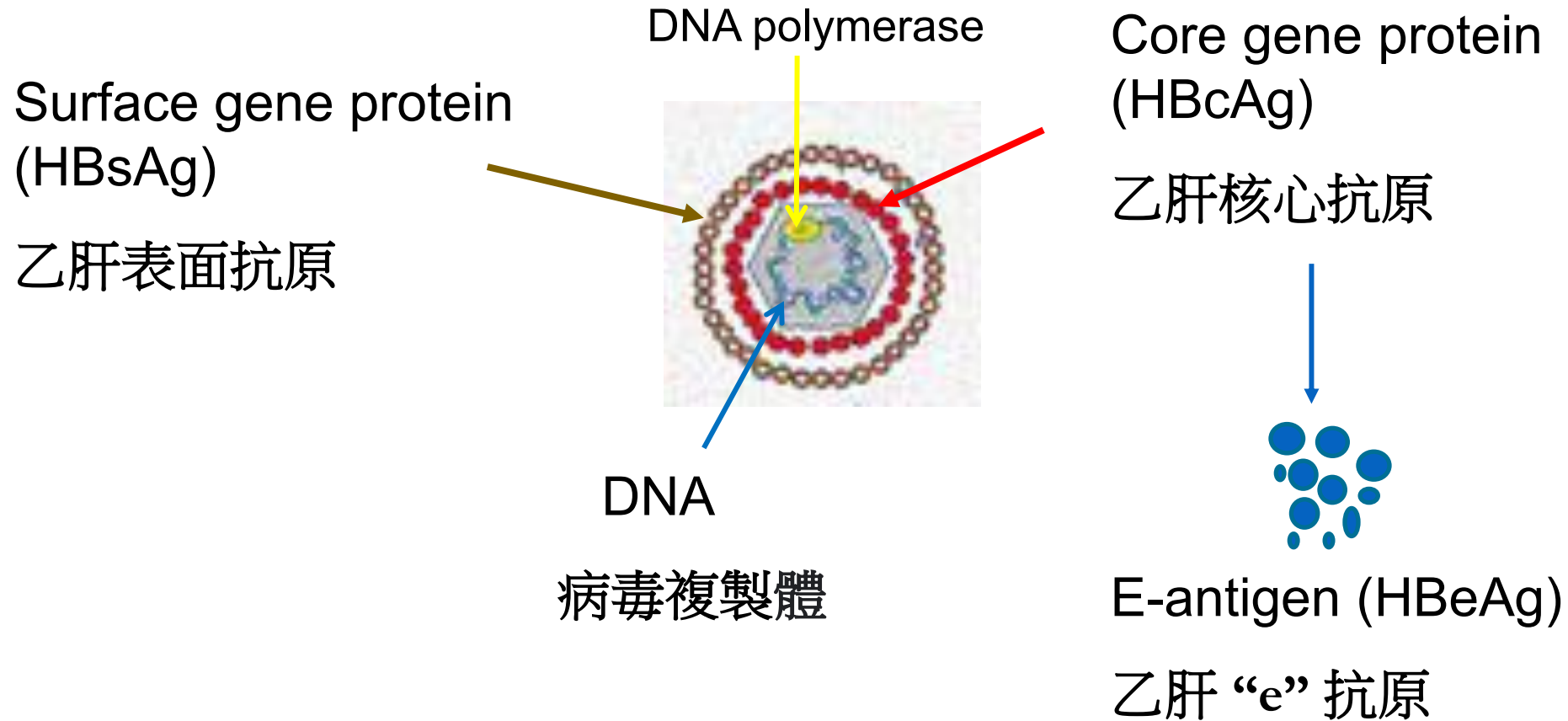
Hepatitis B Virus 乙型肝炎病毒



Hepatitis B Virus Markers 乙肝病毒指標

- HBsAg Hepatitis B surface antigen 乙肝表面抗原
- HBsAb Hepatitis B surface antibody 乙肝表面抗體
- HBeAg Hepatitis B e-antigen 乙肝“e”抗原
- HBeAb Hepatitis B e-antibody 乙肝“e”抗體
- Anti-HBc Hepatitis B core antibody 乙肝核心抗體

Hepatitis B Virus (HBV) 乙肝病毒



Hepatitis B DNA (Viral Load) 病毒脫氧核糖核酸

- Not detected
- < 10 IU/ml (Detectable level)
- $1.2E + 1$ IU/ml = 12 IU/ml
- $1.2E + 2$ IU/ml = 122 IU/ml
- $1.2E + 3$ IU/ml = 1,200 IU/ml
- $1.2E + 4$ IU/ml = 12,000 IU/ml
- $1.2E + 5$ IU/ml = 120,000 IU/ml
- $1.2E + 6$ IU/ml = 1,200,000 IU/ml
- $1.2E + 7$ IU/ml = 12,000,000 IU/ml
- $> 1.2E + 8$ IU/ml = $> 120,000,000$ IU/ml

Your lab results may look like this ...

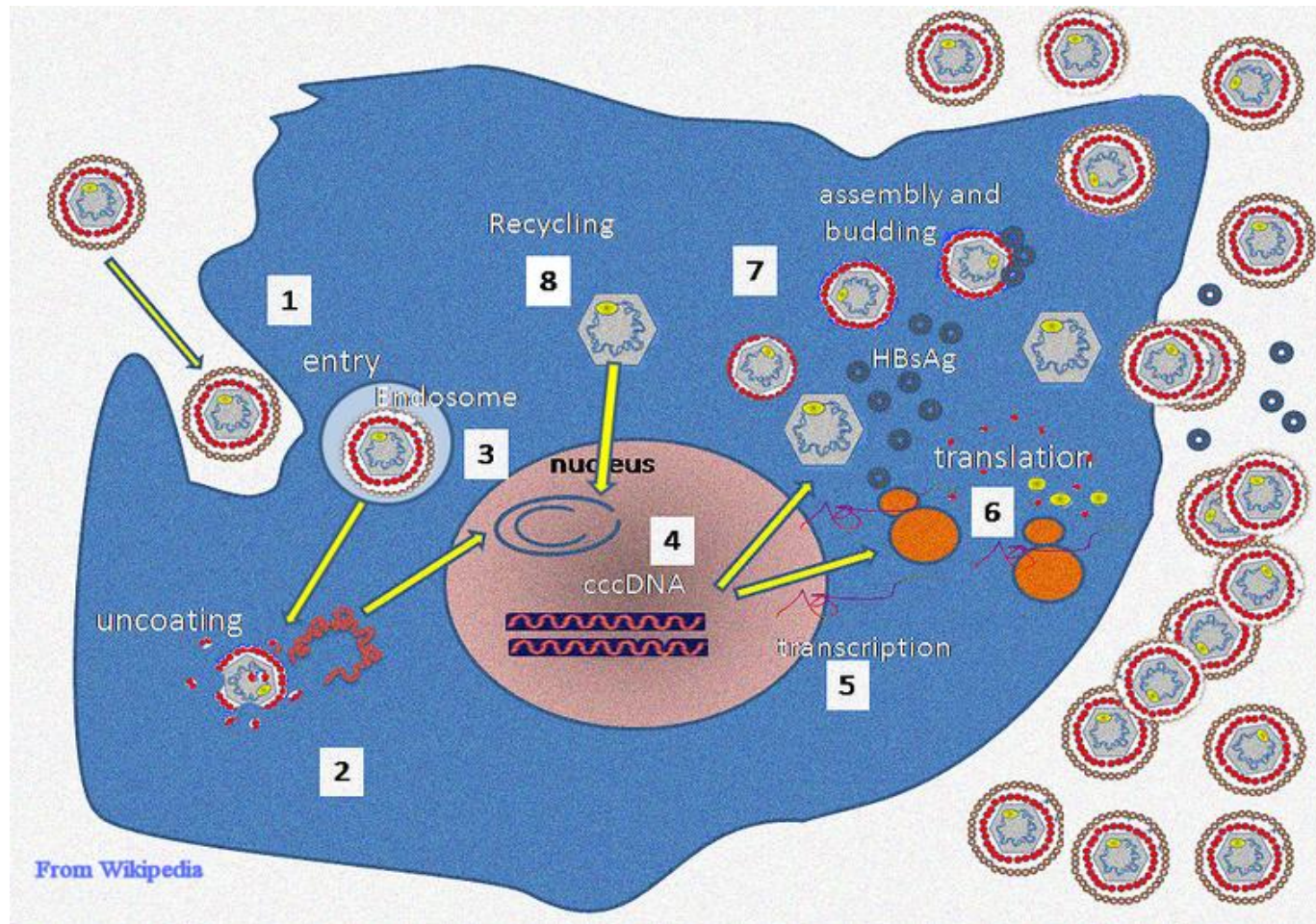
CHEMISTRY, BLOOD  		
Creatinine	03/11/23	86 
eGFR	03/11/23	77 
Albumin	03/11/23	40
Bilirubin, Total	18/05/23	9
AST	03/11/23	74 
ALT	03/11/23	63 
Alkaline Phosphatase	03/11/23	219 
GGT	03/11/23	42 
TUMOR MARKERS  		
AFP (Tumour Marker)	18/05/23	3.2
CBC FOR WHOLE BL...  		
Hb	03/11/23	118 
Hb	28/10/21	122 
WBC	03/11/23	5.5
Plt	03/11/23	180
MPV	03/11/23	11.6
Immature Plt Fraction	28/10/21	. 
RBC	03/11/23	3.66 
Hct	03/11/23	0.36
MCV	03/11/23	98.9 
MCH	03/11/23	32.2 
MCHC	03/11/23	326
RDW-CV	03/11/23	13.4
Differential Type	03/11/23	Automated
Neutrophils	03/11/23	2.8
Lymphocytes	03/11/23	2.1
Monocytes	03/11/23	0.5
Eosinophils	03/11/23	0.1
Basophils	03/11/23	0.0
Immature Granulocytes	03/11/23	0.0

I want to see the trend ...

SEROLOGY					
Hep B Surface Ab (HBsAb)	11/01/23	No evide...		No evide...	
Hep B Surface Ab (HBsAb) (Quant)	11/01/23	<2.00		<2.00	
Hep B Surface Antigen (HBsAg) Q...	11/01/23	186.93 ▲		186.93 ▲	
Hep Be Ab (HBeAb)	23/10/23	Negative	Negative	Negative	Negative
Hep Be Ag (HBeAg)	23/10/23	Positi... !	Positive !	Posit... !	Positive !
VIROLOGY					
HBV DNA	23/10/23				
Hepatitis B DNA Viral Load	23/10/23	NOT DE... *	NOT DE... *	NOT DE... *	

Hepatitis B Virus Reproduction

乙肝病毒複製過程



Complete Blood Count (CBC) Include...

- Hemoglobin (Hb) 血紅素
- WBC (white cell count) 白血球
- Platelets 血小板

Kidney Tests 腎臟檢查

- Creatinine 肌氨酸酐
- GFR (Glomerular filtration rate) 腎小球濾過率
- Urine protein 尿蛋白
- 24 Hour urine for protein 24小時尿蛋白

Diabetes 糖尿病

- Blood glucose 血糖
 - Fasting 空腹
 - Random 隨便
- HA1C 血红蛋白a1c