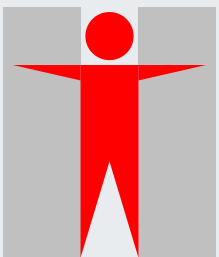


# 內服中成藥中中藥材指標成分的分析 枇杷膏

## 網上分享會

2021年6月23日

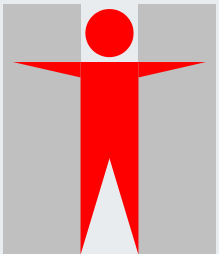


# 項目建立

- 經**檢測中心諮詢委員會**會議商討

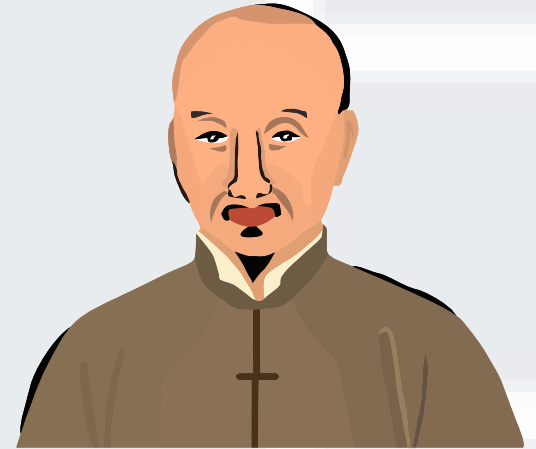
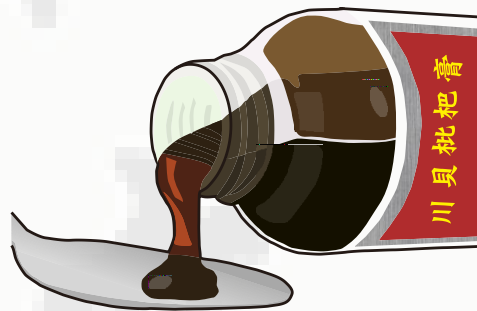
**枇杷膏** 

- 為第一個產品研究目標
- 研究計劃要旨
  - 利用**質譜儀**及**二極管陣列檢測器**
  - 建立及確認定性及/或定量分析方法
  - 檢測君臣藥或最常見的中藥材中化學指標成分

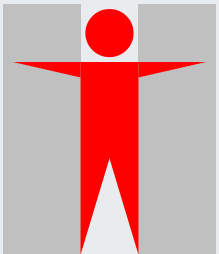


# 枇杷膏的由來

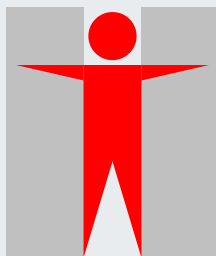
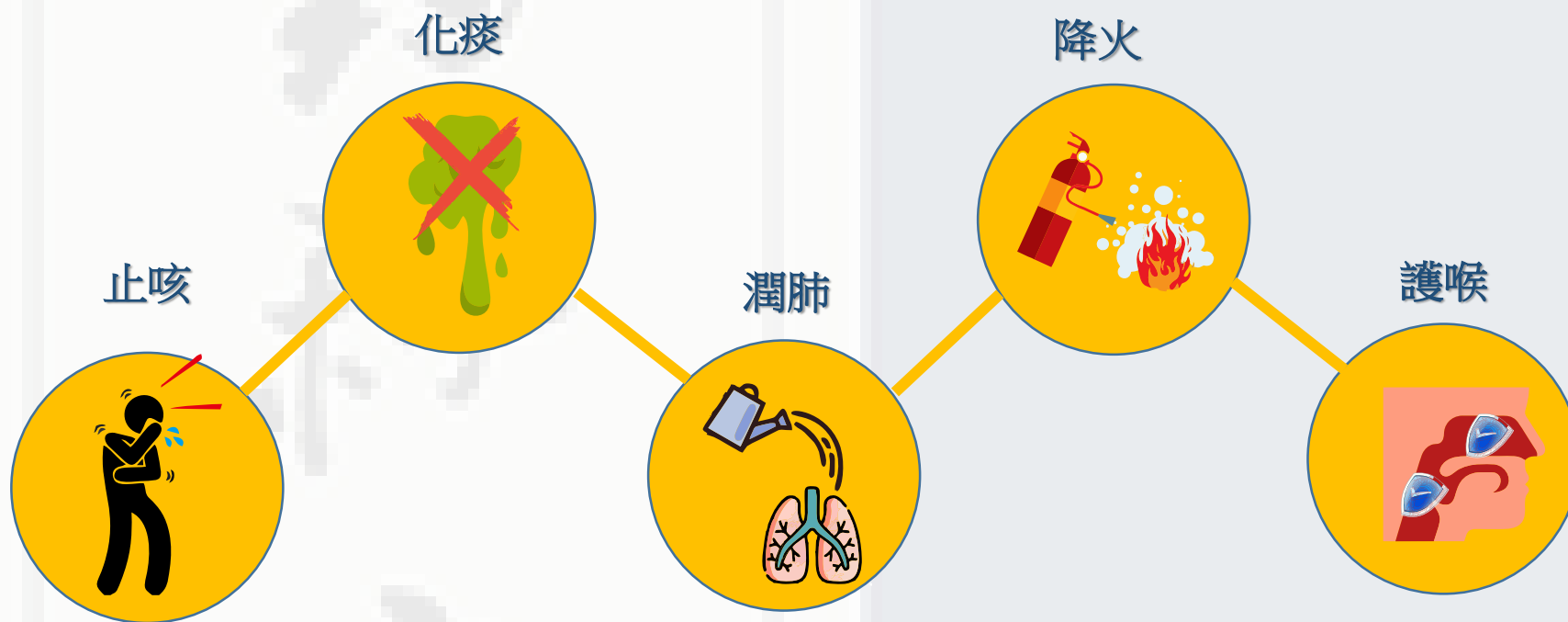
- 清代縣令楊謹侍母至孝，他的娘親久病未癒，
- 楊孝廉遍訪名醫未奏效，後來，他聽聞神醫**葉天士**，攀山涉水期望葉天士幫他的娘親診治，
- 於是葉天士以祖傳秘方，終治好楊老太的久咳、痰多宿疾



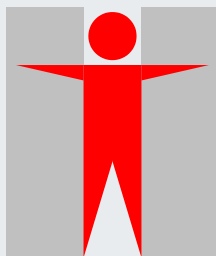
葉天士



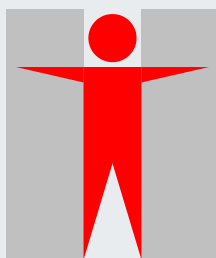
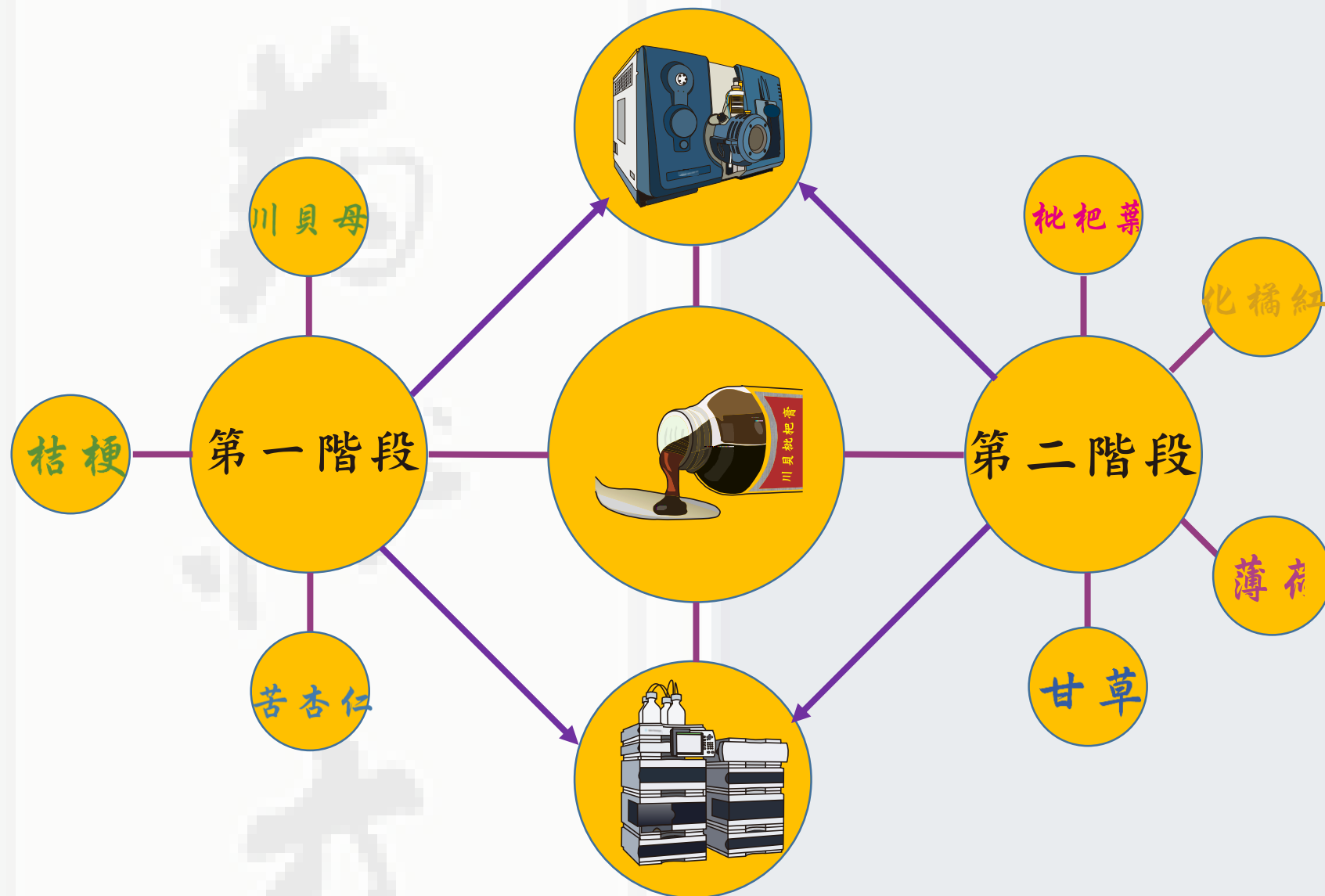
# 枇杷膏的功效



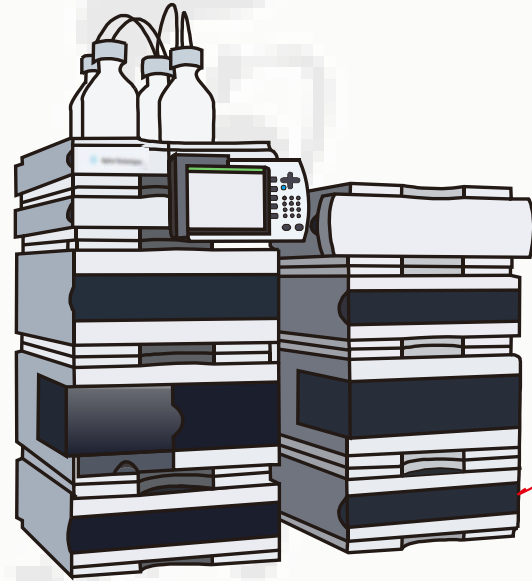
# 枇杷膏的主要藥材



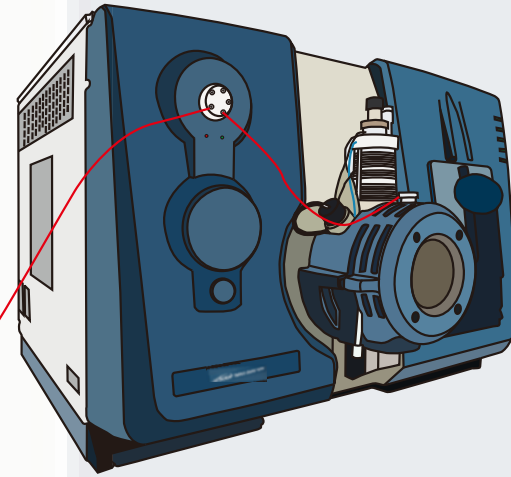
# 分析計劃



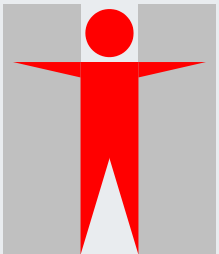
# 高效液相色譜串聯質譜儀 (HPLC-MS/MS)



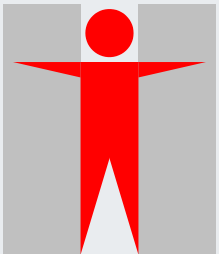
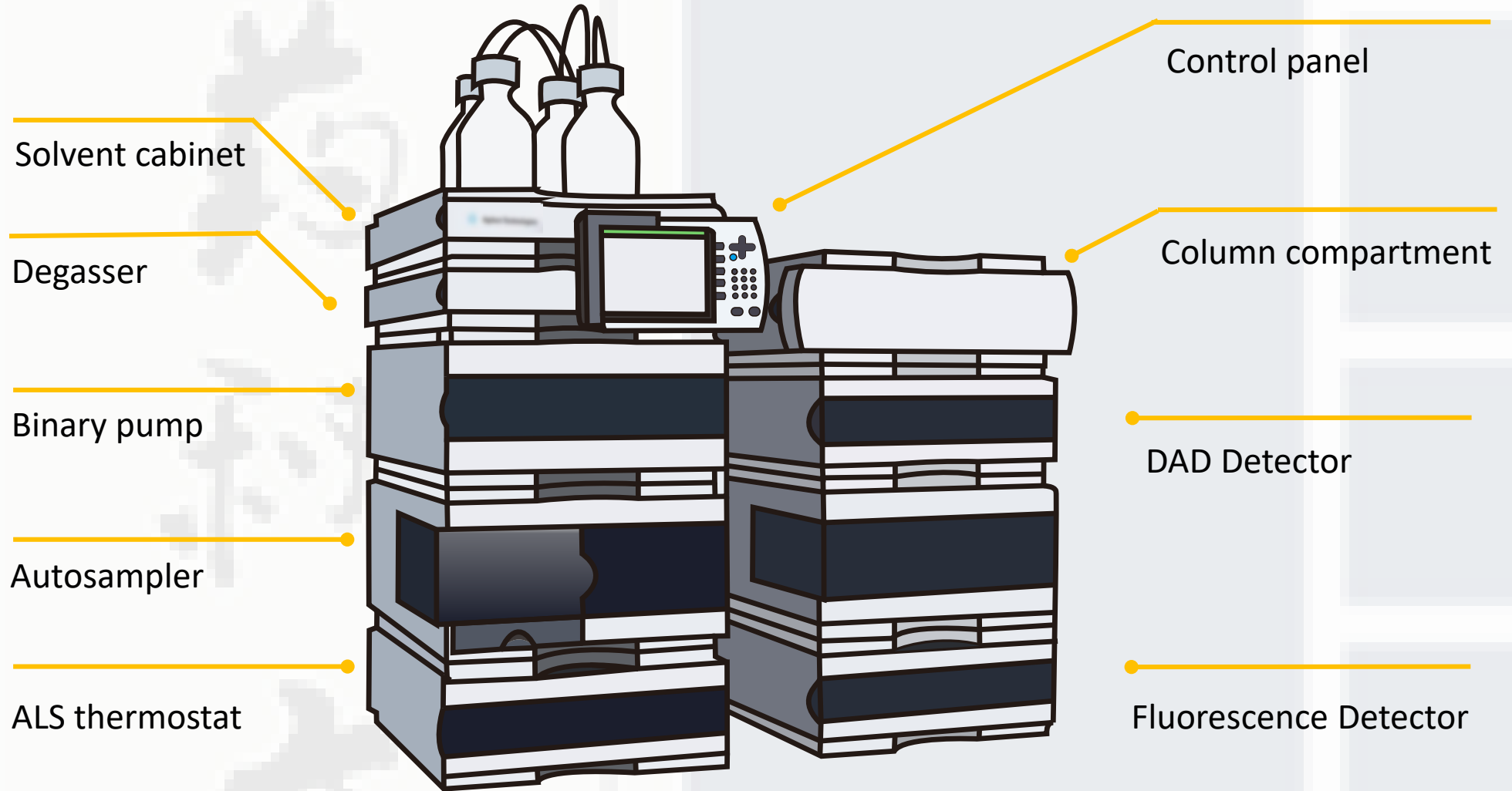
高效液相色譜儀



質譜儀



# 高效液相色譜儀 (HPLC)





# 高效液相色譜儀 (HPLC)

Data Processing station

Binary pump

Degasser

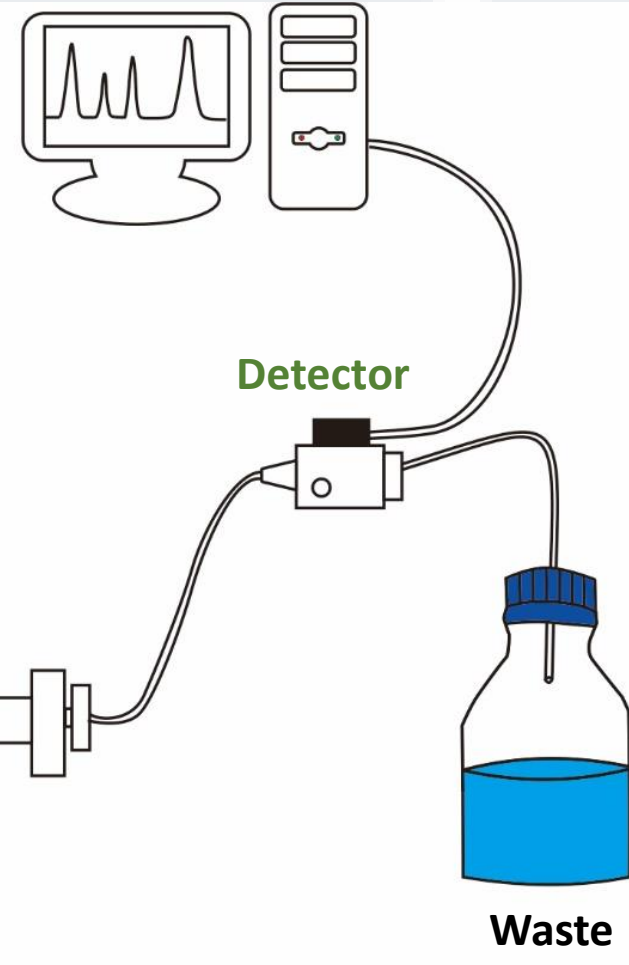
Detector

Analytical column

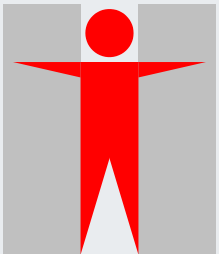
Switching valve

Waste

Pump OFF



Solvent cabinet



# 高效液相色譜儀 (HPLC)

Data Processing station

Binary pump

Degasser

Detector

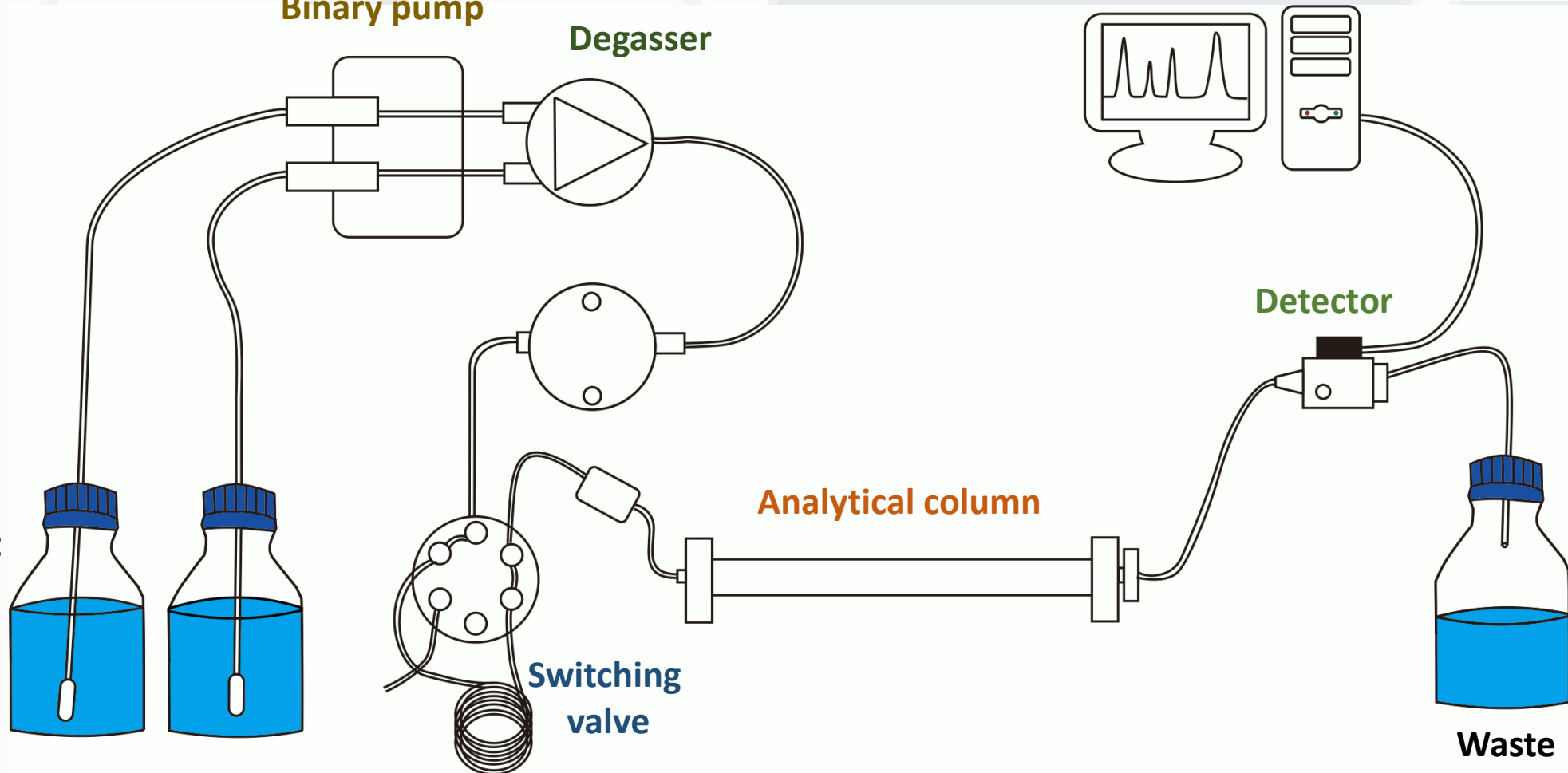
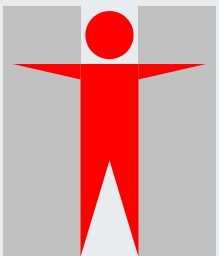
Analytical column

Switching valve

Waste

Pump ON

Solvent cabinet



# 高效液相色譜儀 (HPLC)

Data Processing station

Binary pump

Degasser

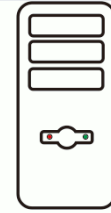
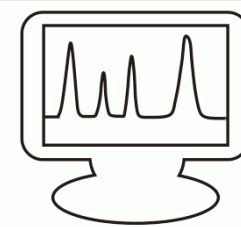
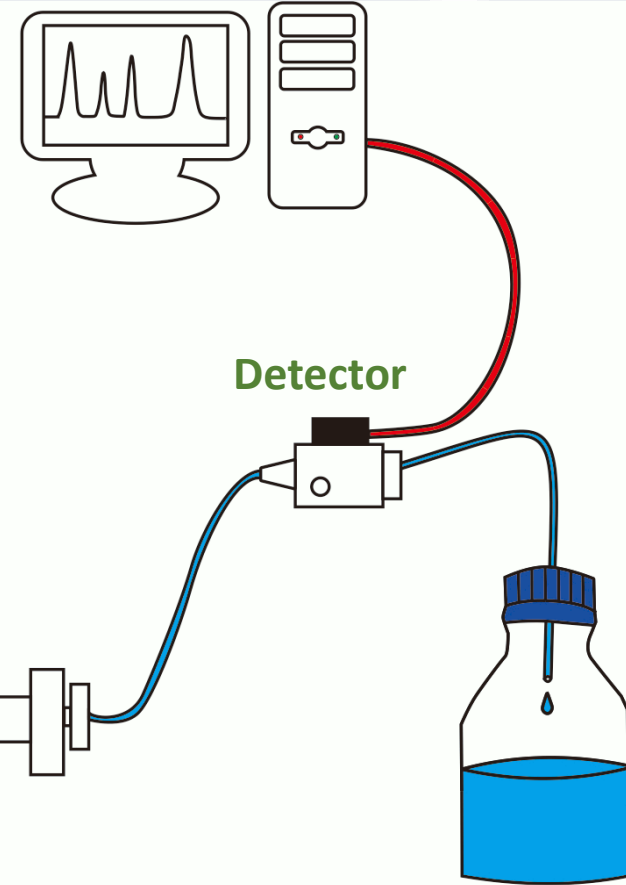
Detector

Analytical column

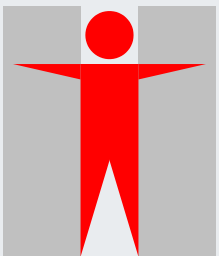
Switching valve

Waste

Pump ON

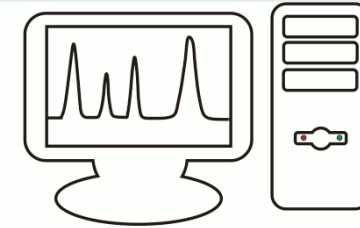


Solvent cabinet

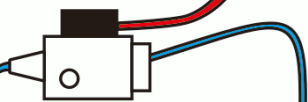


# 高效液相色譜儀 (HPLC)

Data Processing station



Detector



Waste



Analytical column

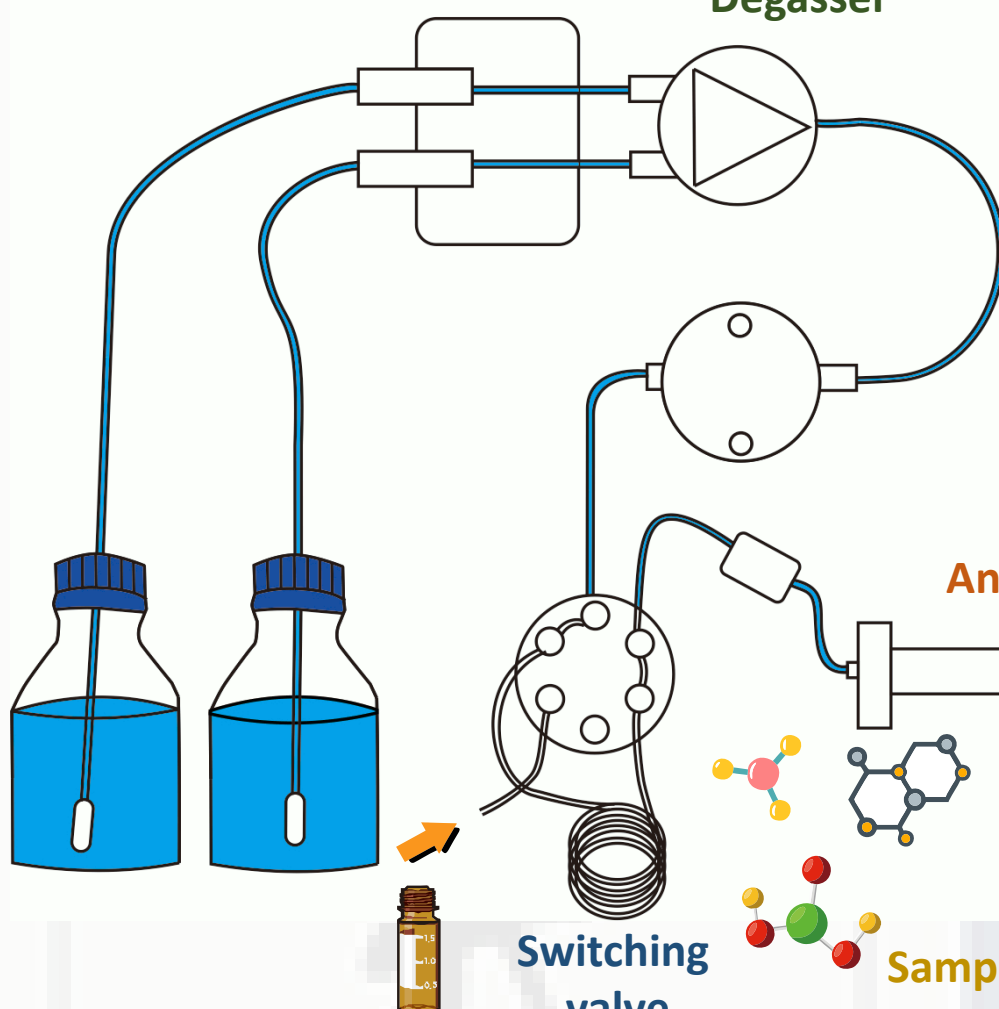


Sample Injection

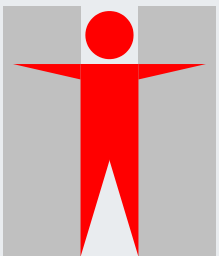
Switching valve

Binary pump

Degasser



Solvent cabinet



# 高效液相色譜儀 (HPLC)

Data Processing station

Binary pump

Degasser

Detector

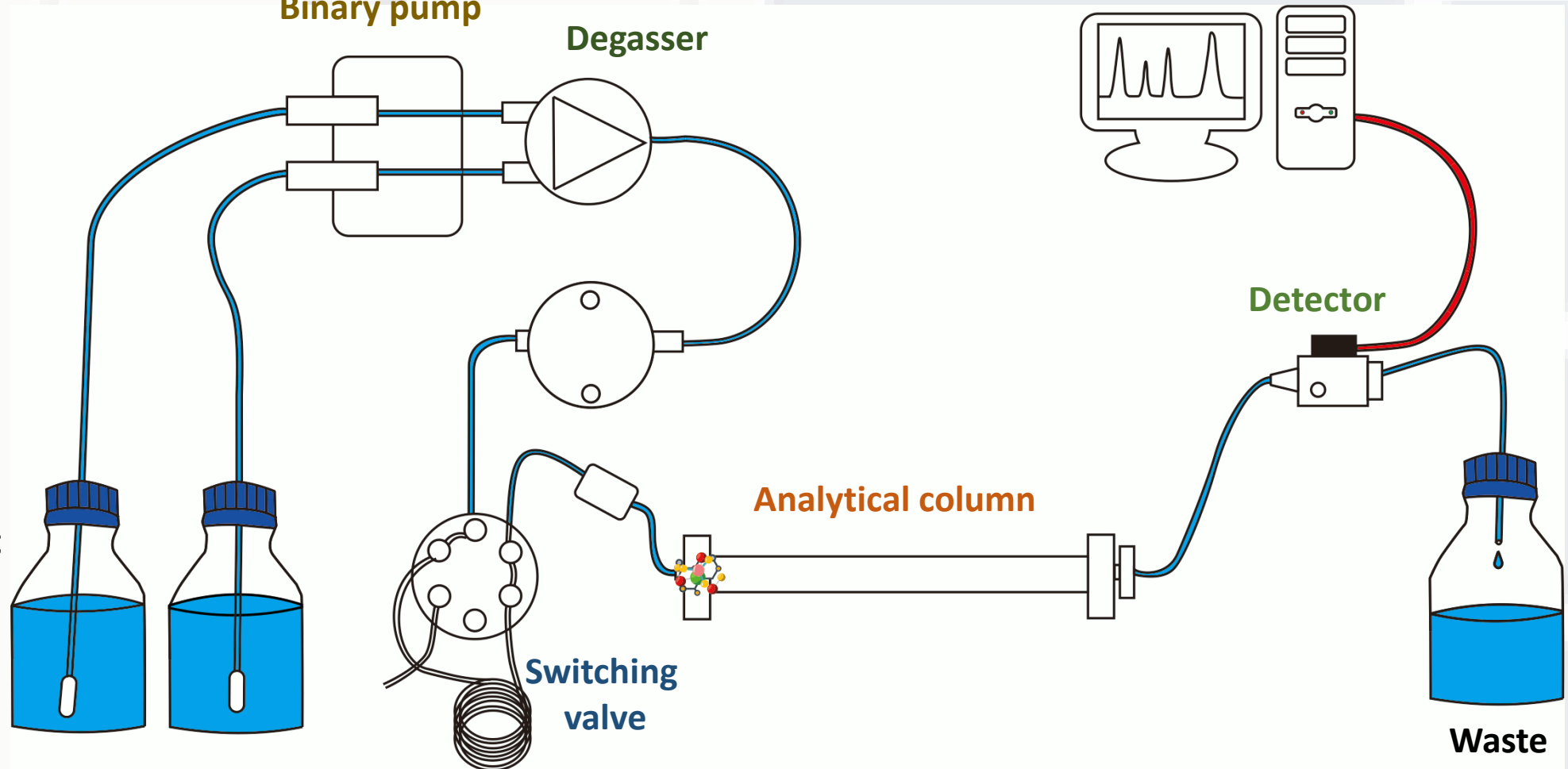
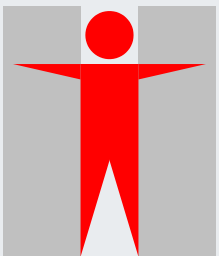
Analytical column

Switching valve

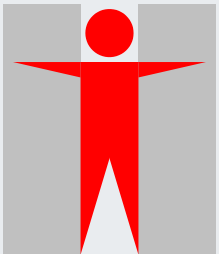
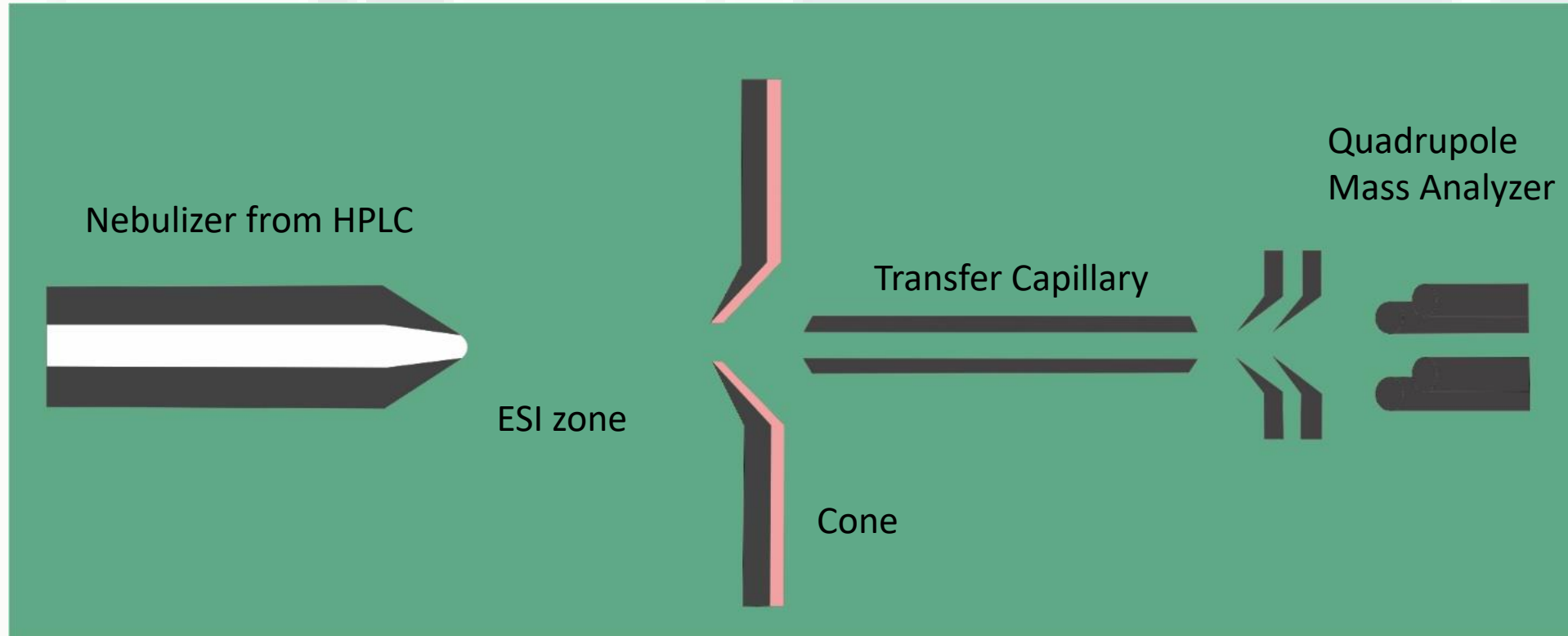
Waste

Analyzing

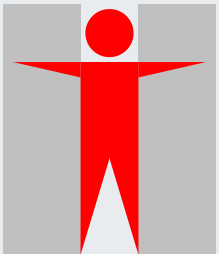
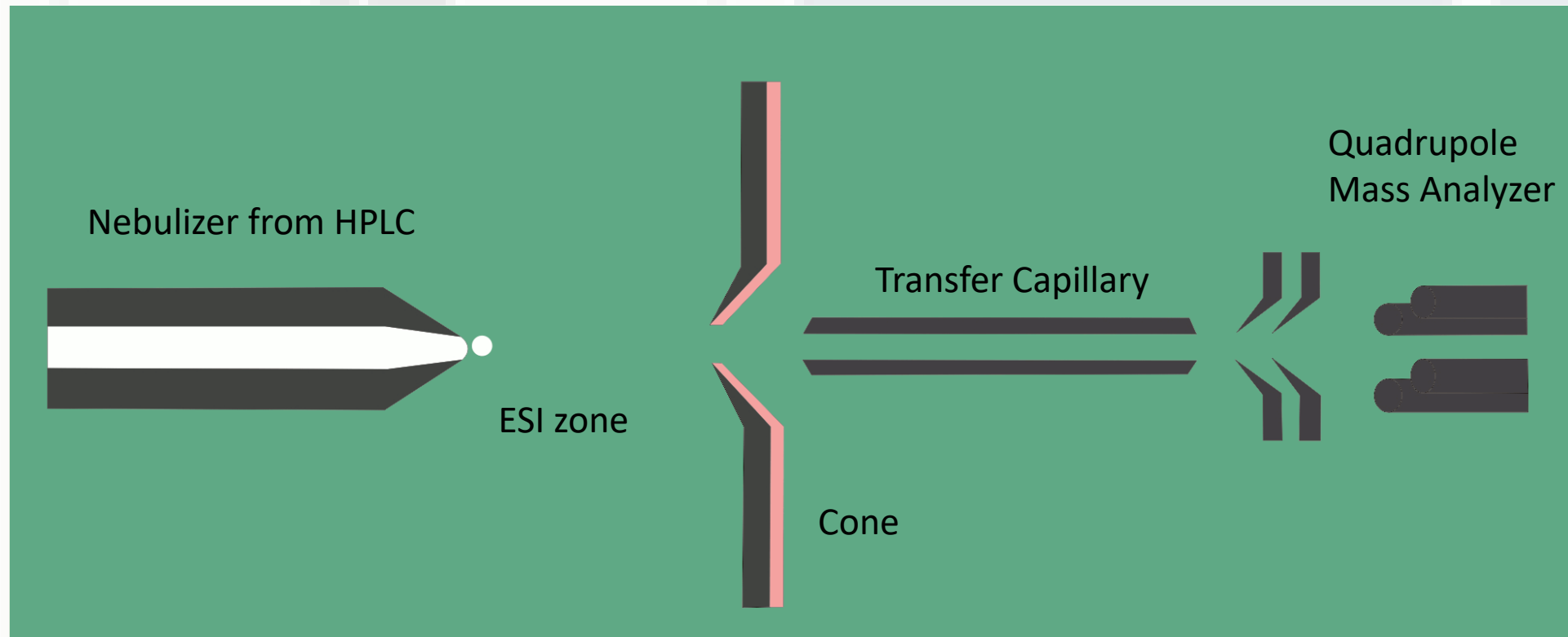
Solvent cabinet



# 電噴霧離子化(ESI)原理

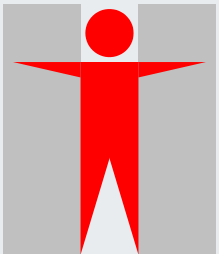
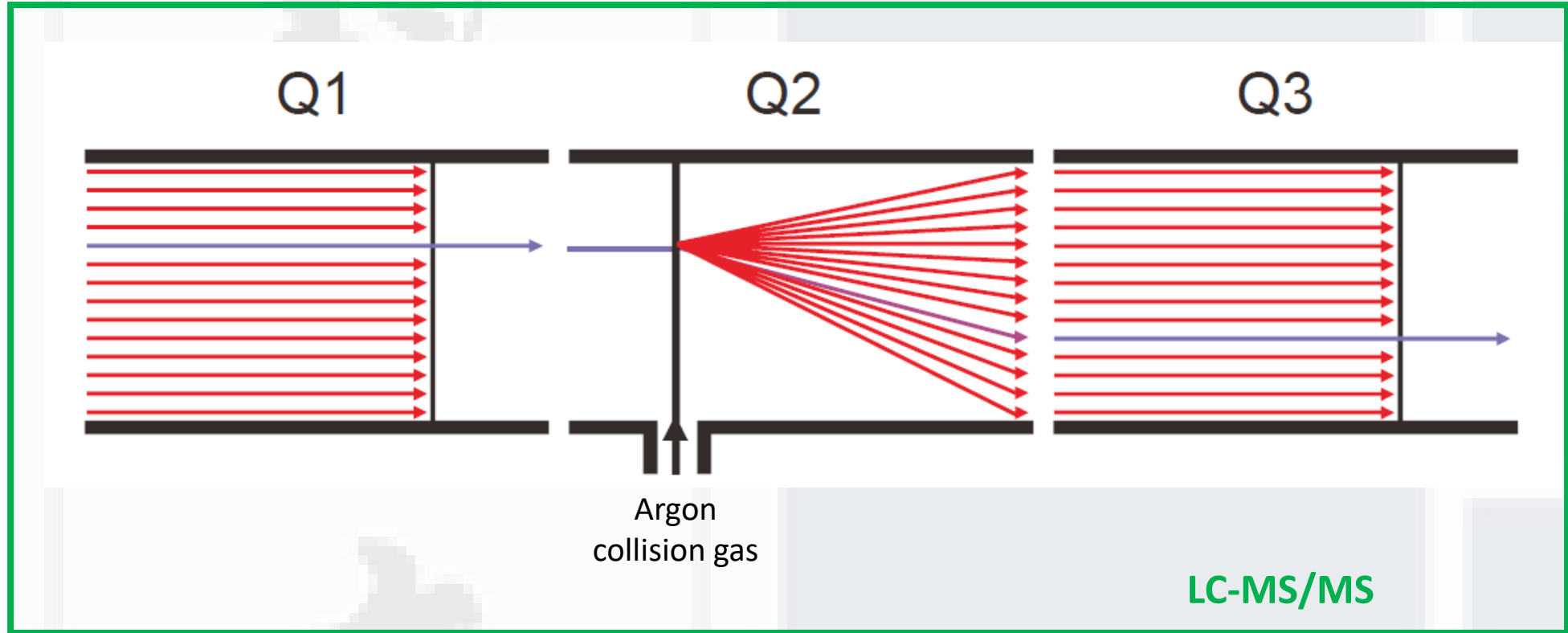


# 電噴霧離子化(ESI)原理



# 質譜儀原理

## 多重反應監測對模式(SRM)





# 第一階段工作



# 第一階段工作



# 川貝母的種類



川貝母

太白貝母

暗紫貝母

瓦布貝母

梭砂貝母

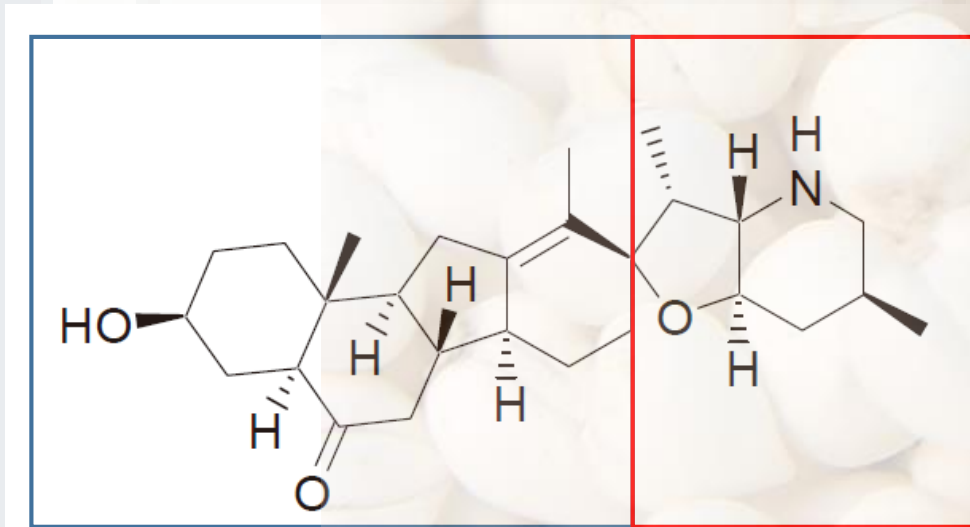
甘肅貝母

# 川貝母中的指標成分的分析

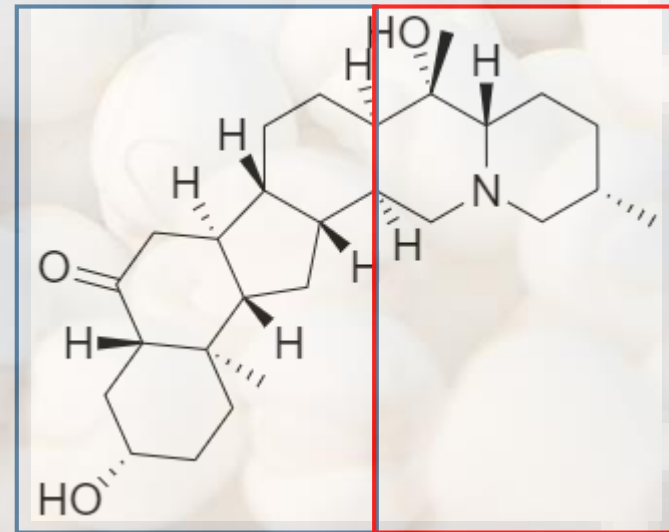
			
類型	功效	性狀	指標成分
<p>百合科植物 的川貝干燥鱗莖</p>	<ul style="list-style-type: none"><li>• 清熱潤肺</li><li>• 化痰止咳</li></ul>	<ul style="list-style-type: none"><li>• 圓錐形或近球</li><li>• 外層鱗葉2瓣</li><li>• 大瓣緊抱小瓣</li><li>• 懷中抱月</li></ul>	<ul style="list-style-type: none"><li>• 貝母辛</li><li>• 貝母素乙</li></ul>

# 川貝母中的指標成分的分析

- 指標成分類型 (Chemical markers classification)
  - 甾體類生物鹼 (Steroidal-alkaloids)



貝母辛  
Peimisine

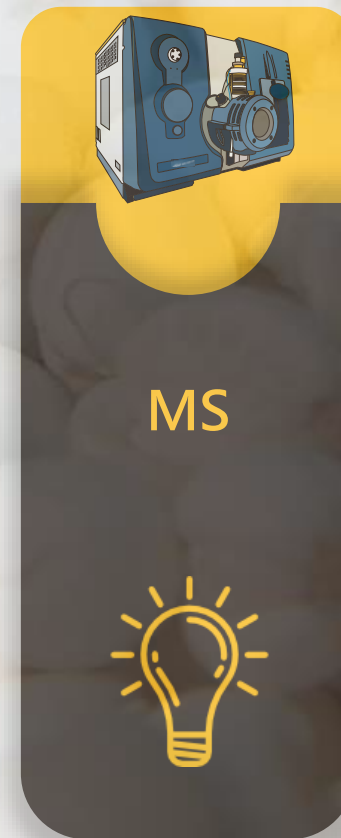
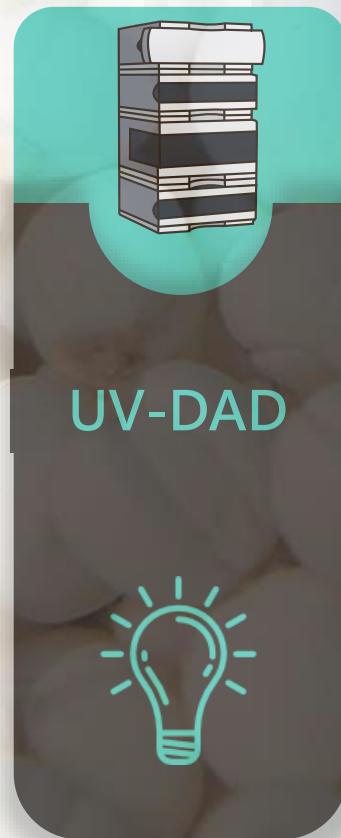
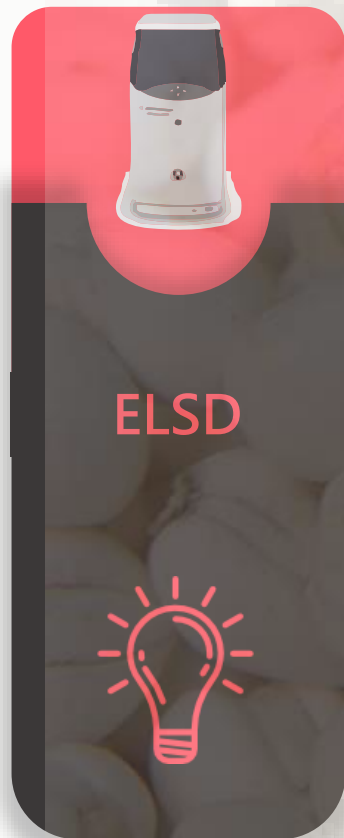


貝母素乙  
Peiminine

# 川貝母中的指標成分的分析

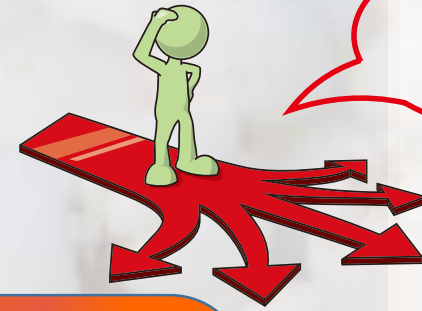


- 分析甾體類生物鹼 (Steroidal-alkaloids)





# 川貝母中的指標成分的分析




用什麼檢測器




- 分析甾體類生物鹼 (Steroidal-alkaloids)



High detection limit



No conjugated UV chromophore



Contain functional group-NH



# 第一階段工作



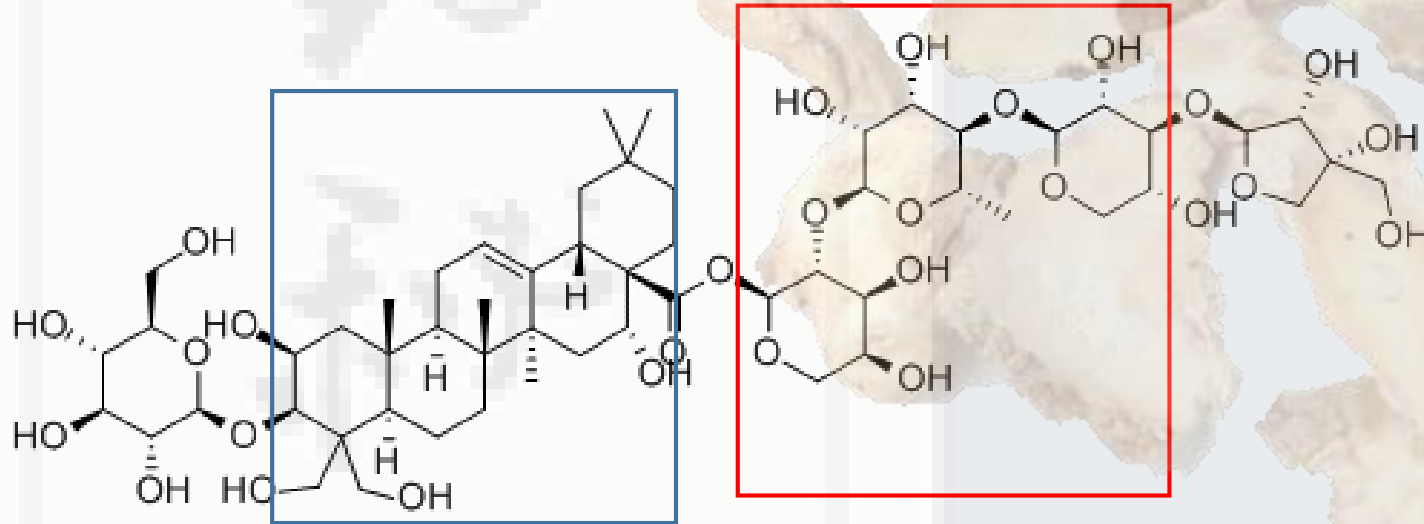


# 桔梗中的指標成分的分析

 類型	 功效	 性狀	 指標成分
<p>桔梗科植物桔梗的干燥根</p>	<ul style="list-style-type: none"><li>• 宣肺利咽</li><li>• 祛痰，排膿</li></ul>	<ul style="list-style-type: none"><li>• 呈圓柱形或略呈紡錘形</li><li>• 下部漸細</li><li>• 略扭曲</li><li>• 表面淡黃白色</li></ul>	<ul style="list-style-type: none"><li>• 桔梗皂苷 D</li></ul>

# 桔 梗 中 的 指 標 成 分 的 分 析

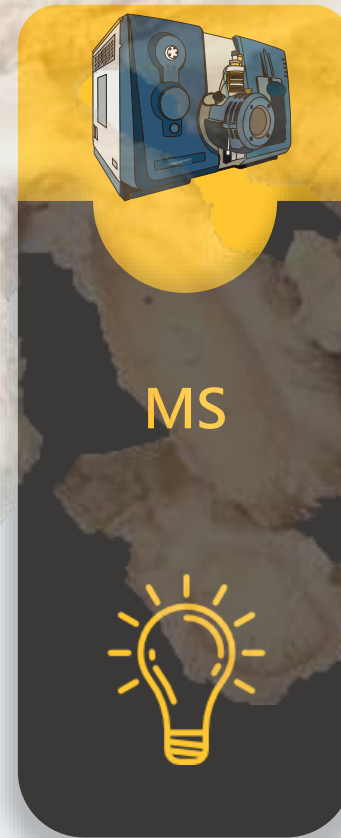
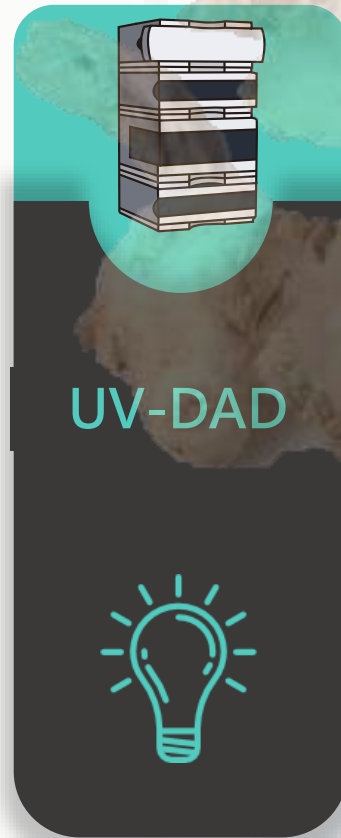
- 指標成分類型 (Chemical markers classification)
  - 三萜類皂苷 (Triterpenoid saponin)



桔梗皂苷 D  
Platycodin d

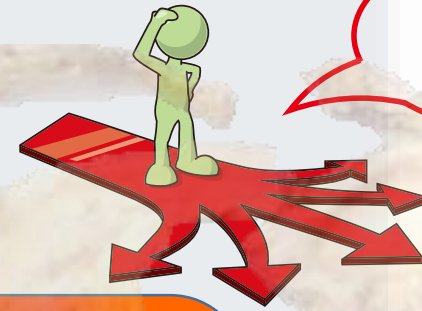
# 桔 梗 中的指標成分的分析

- 分析三萜類皂苷 (Triterpenoid saponin)





# 桔 梗 中的指標成分的分析


用什麼檢測器



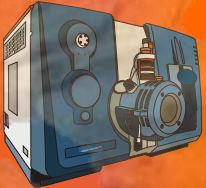
- 分析三萜類皂苷 (Triterpenoid saponin)




High detection limit



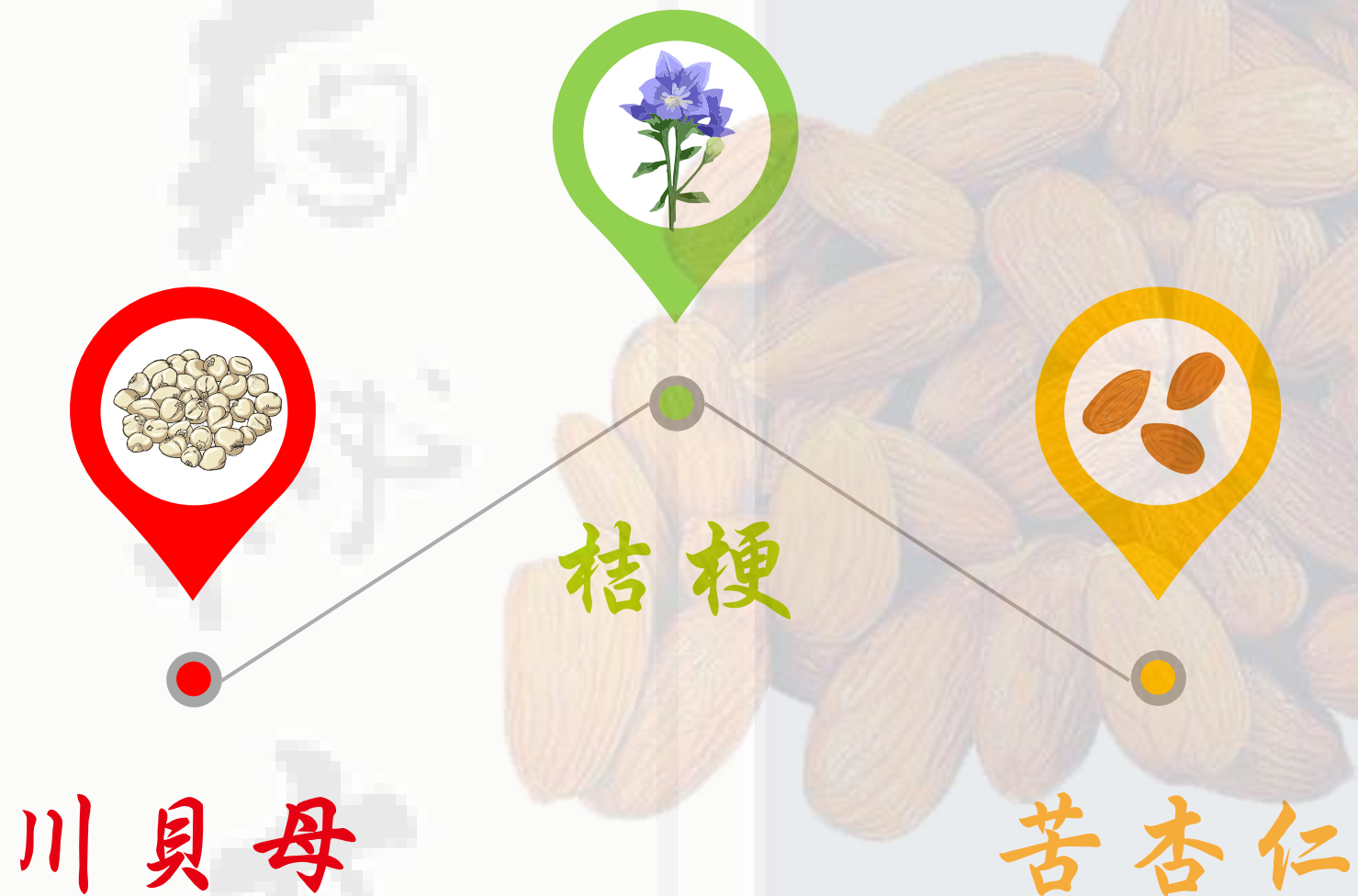
No conjugated UV chromophore



Contain functional group-OH



# 第一階段工作

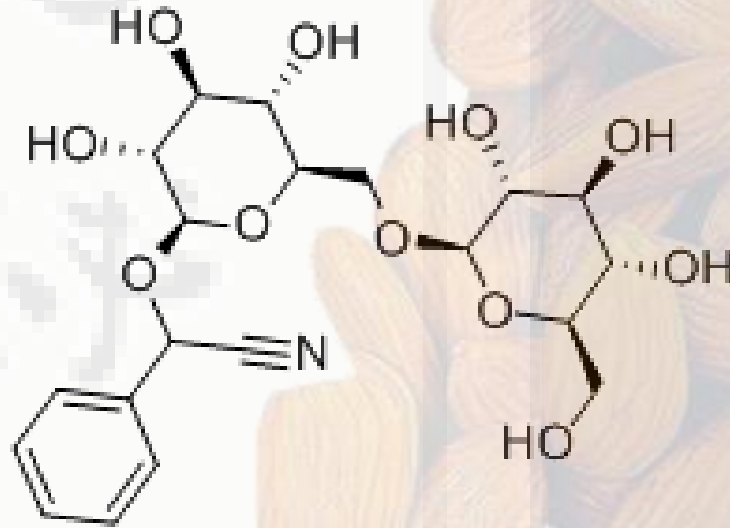


# 苦杏仁中的指標成分的分析

 類型	 功效	 性狀	 指標成分
<p>薔薇科植物的杏仁的乾燥成熟種子</p>	<ul style="list-style-type: none"><li>• 降氣</li><li>• 止咳</li><li>• 平喘</li></ul>	<ul style="list-style-type: none"><li>• 呈扁心形</li><li>• 表面黃棕色至深棕色</li></ul>	<ul style="list-style-type: none"><li>• 苦杏仁苷</li></ul>

# 苦杏仁中的指標成分的分析

- 指標成分類型 (Chemical markers classification)
  - 糖苷類 (Glycosides)

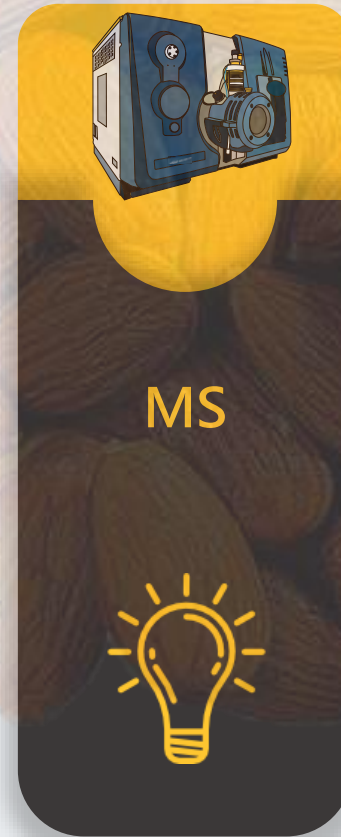
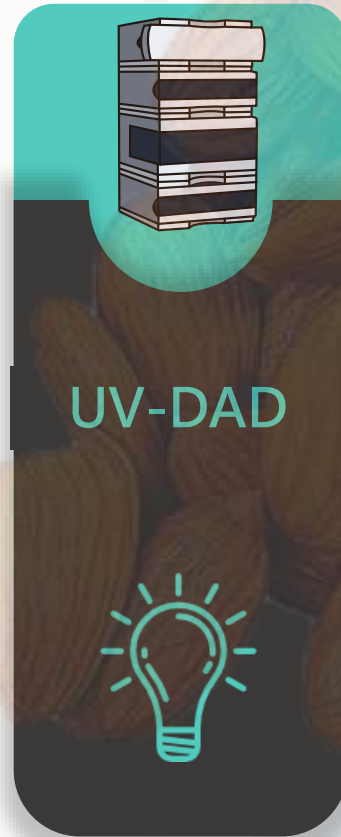


苦杏仁苷  
Amygdalin

# 苦杏仁中的指標成分的分析



- 分析糖苷類 (Glycosides)








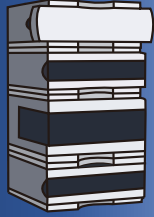

# 苦杏仁中的指標成分的分析




- 分析糖苷類 (Glycosides)



High detection limit



No conjugated UV chromophore



Contain functional group-OH



# 枇杷膏的分析過程



枇杷膏

稀釋

樣本

質譜儀

數據

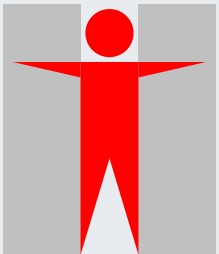
0.2 g 於  
15-mL  
離心管

10-mL溶劑  
於離心管

超聲波  
10mins  
及過濾

儀器分析

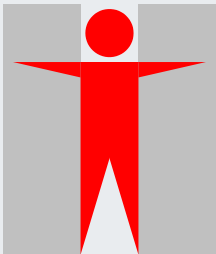
數據  
分析



# 枇杷膏的分析過程

液相色譜的系統	Dionex UltiMate 3000 液相色譜系統			
色譜柱	GL Science Intersil ODS-4, 2.1 X 250 mm, 5µm			
柱溫	25 °C			
自動進樣器溫度	20 °C			
流速	0.3 mL/min			
進樣量	5 µL			
流動相	A: 0.02% 甲酸 B: 乙腈			
梯度	時間 (min)	A %	B %	流速
	0.0	80	20	0.3
	4.0	80	20	0.3
	9.0	70	30	0.3
	14.0	50	50	0.3
	16.0	5	95	0.3
	18.0	5	95	0.3
	18.1	80	20	0.3
	22.0	80	20	0.3

分析物	多重反應監測對	Dwell time msec	DP	EP	CE	CXP	
桔梗皂苷D	1223.6 → 469.2	Quantifying MRM	100	-265	-10	-74	-25
	1223.6 → 681.4	Qualifying MRM	100	-265	-10	-79	-25
苦杏仁苷	456.2 → 323.1	Quantifying MRM	100	-100	-10	-18	-11
	456.2 → 179.1	Qualifying MRM	100	-100	-10	-22	-11
貝母辛	428.3 → 114.1	Quantifying MRM	100	110	10	39	15
	428.3 → 410.3	Qualifying MRM	100	110	10	39	15



# 自製枇杷膏樣本

## 枇杷膏處方箋

北沙參	茯苓	苦杏仁油	法半夏	甘草	苦杏仁	枇杷葉	川貝母
0.25克	0.25克	0.25克	0.25克	5克	0.15克	2.5克	5克
遠志	五味子	款冬花	瓜蒌子	生薑	薄荷腦	化橘紅	桔梗
0.75克	0.05克	0.75克	0.25克	0.25克	0.25克	1克	0.5克

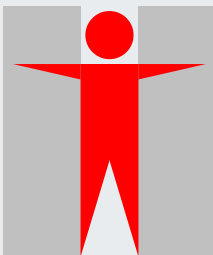
中醫師  
GCMTI



實驗樣本

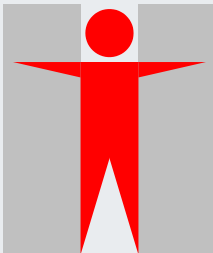
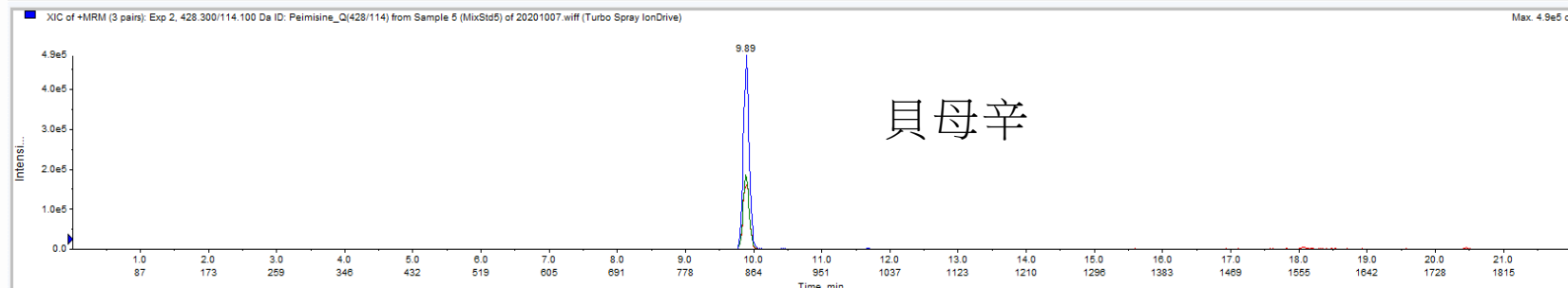
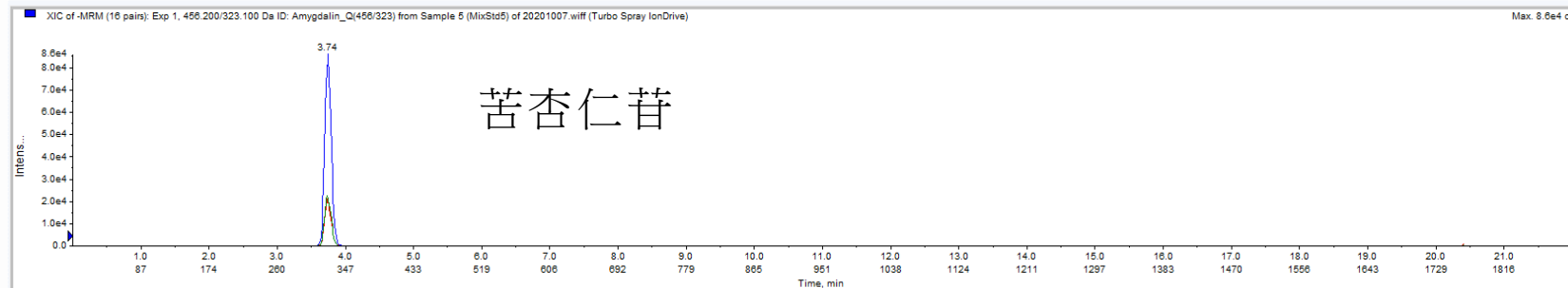
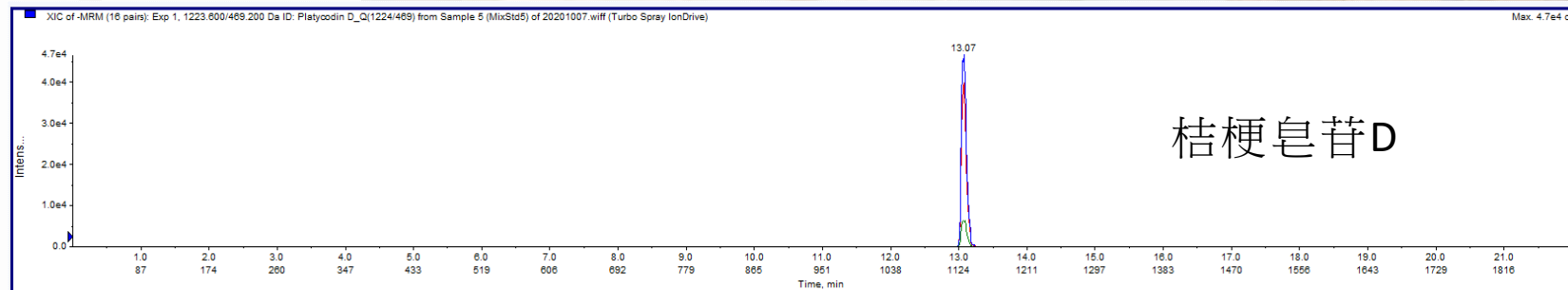


陰性對照樣本



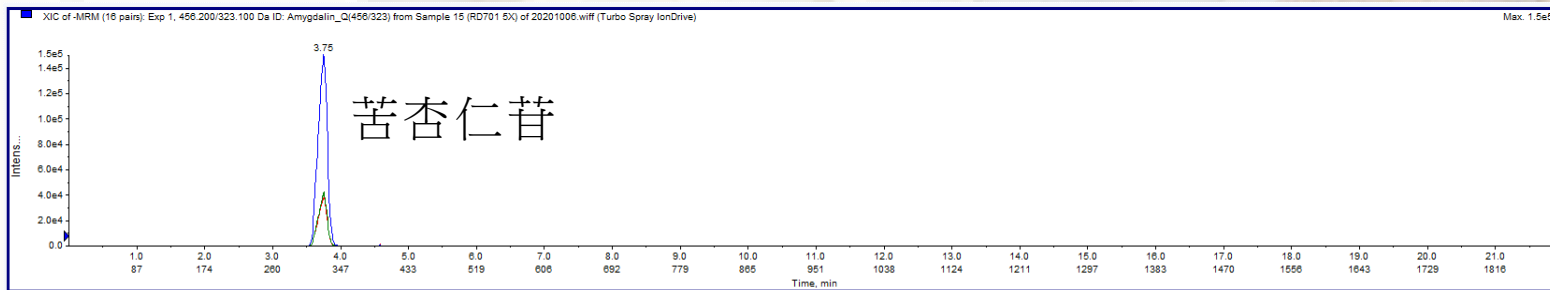
# 質譜儀分析

- 標準品色譜圖：

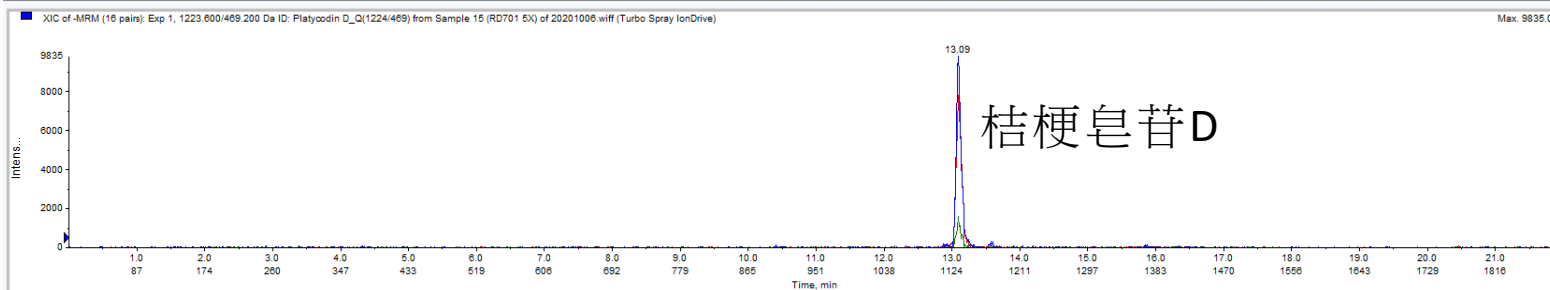


# 質譜儀分析

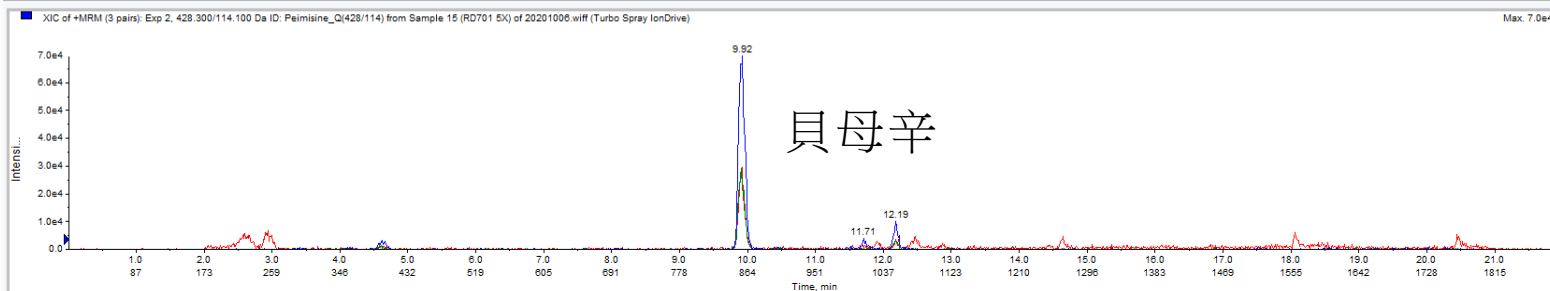
- 樣本色譜圖：



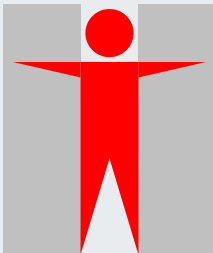
RSD 3.14%



RSD 3.92%

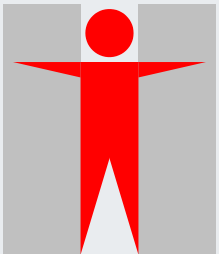
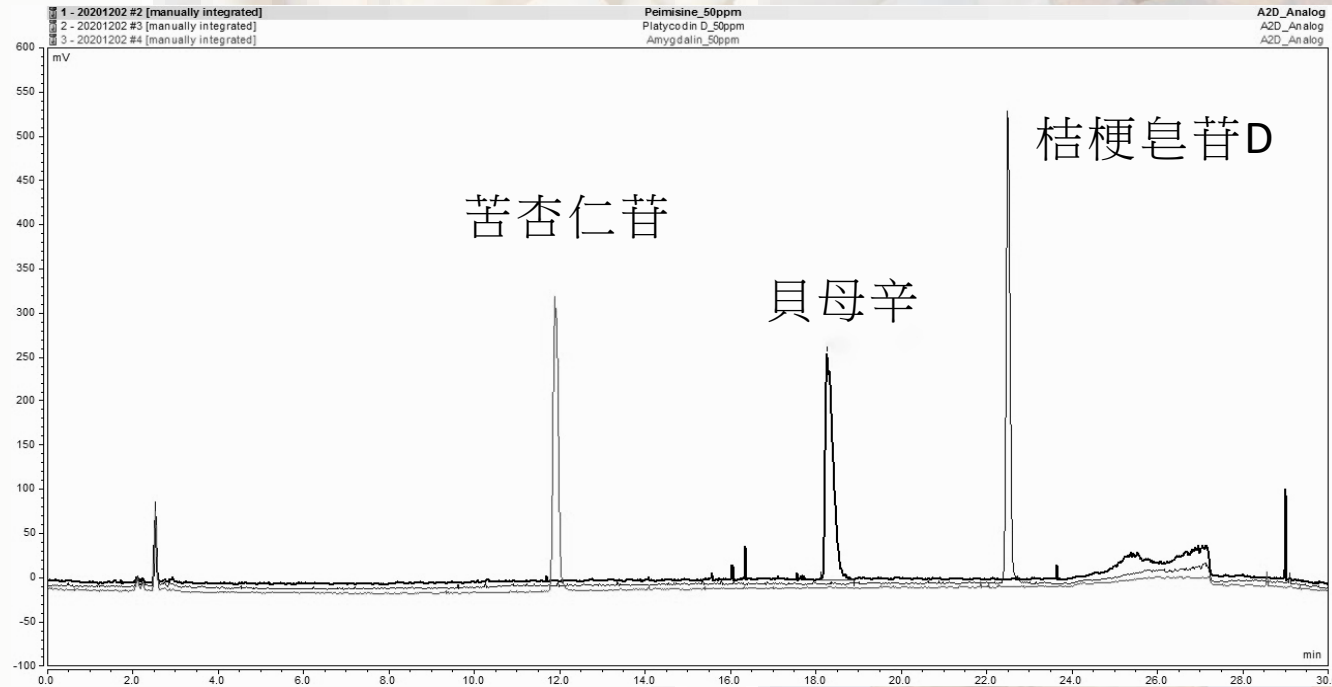


RSD 2.67%



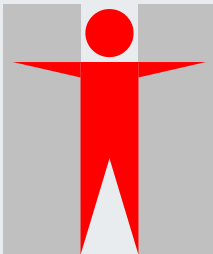
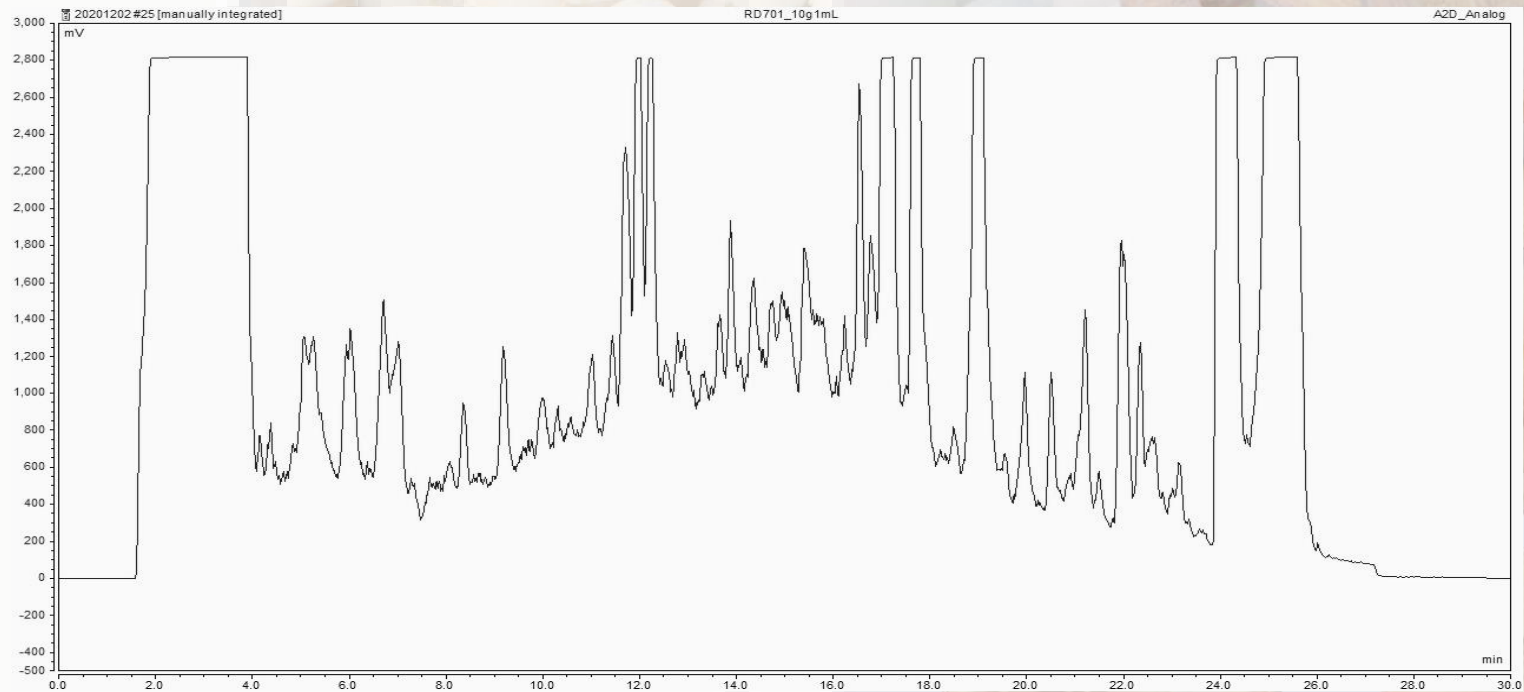
# 二極管陣列檢測器分析

- 標準品色譜圖：



# 二極管陣列檢測器分析

- 樣本色譜圖：





# 研究成果

[https://www.cmro.gov.hk/html/b5/GCMTI/results\\_index.html](https://www.cmro.gov.hk/html/b5/GCMTI/results_index.html)



- ▶ 主頁
- ▶ 重要資訊
- ▶ 關於我們
- ▶ 政府中藥檢測中心
- ▶ 世衛傳統醫藥合作中心
- ▶ 中成藥生產質量管理規範
- ▶ 網上資源
- ▶ 健康資訊及活動
- ▶ 相關網頁
- ▶ 聯給我們

政府中藥檢測中心  
研究成果

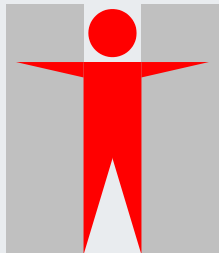
性狀及顯微鑒別

- 香港容易混淆中藥的性狀及顯微鑒別研究

生物科技及化學

- 外用藥油中中藥材指標成分的分析
- 以DNA技術作為鑒別鹿茸的互補檢測方法
- 中藥材參考DNA序列庫
- 內服中成藥中中藥材指標成分的分析(枇杷膏)

測試方法



謝謝

