### Hong Kong Metropolitan University 香港都會大學

**Jockey Club STEAM Education Resources Sharing Scheme   
賽馬會STEAM教育資源共享計劃**

**Student Online Workshop 學生網上工作坊 –   
Making Disinfectant Hand Gel 自製搓手液**

**Workshop Guidelines 工作坊指引**

1. Please check the materials in the package. You should have the following:  
   請檢查實驗材料包內的物資，當中包括：

|  |  |
| --- | --- |
| 1. A plastic bottle containing 18 mL of aloe gel 2. 2 mL of glycerol 3. 30 mL of 96% ethanol 4. One stirring stick 5. One dropper 6. One label sticker | 1. 膠樽連18毫升蘆薈啫喱 2. 2毫升甘油 3. 30 毫升酒精 (96% 乙醇) 4. 1支攪拌棍 5. 1支滴管 6. 1張標籤貼紙 |

1. Please prepare your package before the workshop starts.  
   請於工作坊開始前準備好實驗材料包。
2. Please turn on your camera during the workshop.  
   請於工作坊期間開啟視訊。
3. Please stay muted unless you are asked to respond verbally.  
   請於工作坊期間保持靜音狀態，講師要求以語音回應除外。
4. You may “Raise Hand” or use the chat function anytime if you encounter any difficulties.  
   工作坊期間如有任何問題，可「舉手」或於「聊天」內提出。
5. Please read the experiment protocol thoroughly and follow the steps of the instructors during the workshop.   
   請詳閱附上之實驗指引及於工作坊期間遵照講師的步驟進行實驗。
6. For security and attendance reasons, please display your screen name in the following format:   
   基於保安理由及作點名之用，請按以下格式輸入螢幕顯示姓名：  
   **Abbreviation of school name** and your **full English name**, e.g. **HKMU CHAN Tai Man**  
   **學校名稱的英文縮寫**及**你的英文全名**，例：**HKMU CHAN Tai Man**
7. You may start joining 15 minutes before the Online Workshop.  
   同學可於活動開始前15分鐘登入。
8. Please keep the meeting ID and passcode confidential and do not disclose the information to any unauthorized parties.  
   會議號碼及密碼必須保密，請不要向未經授權人士透露工作坊的會議號碼及密碼。

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| **Zoom Meeting Information / Zoom 會議資料**   |  |  | | --- | --- | | Date 日期 |  | | Time 時間 |  | | Online Workshop meeting link 網上工作坊連結 |  | | Meeting ID會議號碼 |  | | Passcode密碼 |  | |

# Making Disinfectant Hand Gel　自製搓手液

## Introduction　簡介

Nowadays, masks and hand gels have become as important as smartphones or even more so. Due to the pandemic, we started to pay more attention to our personal hygiene. Do you still remember the situation in early 2020? Masks and hand gels were completely sold out in many stores and supermarkets, while many people still did not have any. Fortunately, disinfectant hand gel is not too complicated to make. Many formulations, suggestions and videos about DIY hand gel have been posted and uploaded to different media platforms, and people follow those instructions to make their own hand gel. However, do you think that all the information from the Internet is correct? Is the DIY hand gel really effective to keep our hands clean and eliminate bacteria and viruses?

To answer these questions, we need to acquire some basic knowledge of bacteria and viruses (microbiology and biochemistry). The chemical knowledge of the ingredients or reagents used to make the hand gel is also important for us to comment on or criticize whether a proposed hand gel formulation is safe to use or not. In order to determine whether a hand gel is effective in eliminating bacteria or viruses, we should learn some detection and identification methods of pathogens so that we can tell whether our hands are clean after using the hand gel. If you want to know more, this workshop can help you.



近年，口罩與搓手液已漸漸變成生活必須品，重要程度直逼智能電話。因疫情關係，人們對個人衛生的要求愈來愈高。還記得疫情初期時，即使口罩和搓手液通通售罄，人們的需求卻有增無減，「一罩、一液難求」。可幸是因為制作搓手液的難度相對口罩低，當時媒體和網絡上開始出現不少自製搓手液的配方和教學。人們如獲至寶地開始「搓手液DIY」。可是你有了解或質疑過這些網絡資訊嗎？可曾懷疑過自製的搓手液真的能夠有效地清潔雙手、消滅細菌病毒嗎？

這次的工作坊會嘗試和同學一起回答上述疑問。首先我們需要對細菌和病毒的生理結構先有初步的了解，若能夠知道更多有關搓手液的化學成份和其對於人體和細菌病毒的作用，我們便可以粗略地分辨出哪種搓手液更能清潔雙手及消滅細菌病毒。除此之外，認識更多關於檢測和鑑定細菌病毒的方法和原理後，可使我們對於如何量度搓手液的消毒效能有更深入的了解，從而得知我們在使用搓手液後，雙手清潔程度的變化。

## Objectives　主旨

**For junior secondary students:**

**以初中學生為對象：**

* 1. To know the structures of bacteria and viruses  
     認識細菌和病毒的生理結構
  2. To understand the different purposes of chemicals used in hand gel   
     了解搓手液內，各種不同化學物質的使用目的
  3. To know the techniques and methods used for the detection and identification of bacteria and viruses  
     認識各種檢測和鑑定細菌和病毒的方法

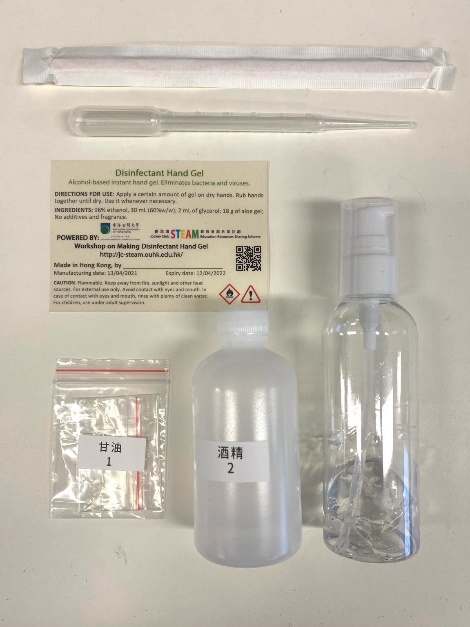
**For senior secondary students:  
以高中學生為對象：**

1. To know the structures of bacteria and viruses  
   認識細菌和病毒的生理結構
2. To understand the different purposes of chemicals used in hand gel  
   了解搓手液內，各種不同化學物質的使用目的
3. To explain how the chemicals kill, destroy or remove pathogens  
   解釋不同化學物質如何殺死，破壞和移除致病原
4. To know the techniques and methods used for the detection and identification of bacteria and viruses  
   認識各種檢測和鑑定細菌和病毒的方法

## Materials　材料

1. A plastic bottle containing 18 mL of aloe gel

膠樽連18毫升蘆薈啫喱



1

3

2

4

5

6

1. 2 mL of glycerol

2毫升甘油

1. 30 mL of 96% ethanol

30 毫升酒精（96% 乙醇）

1. 1 stirring stick

1支攪拌棒

1. 1 dropper

1支滴管

1. 1 label sticker

1張標籤貼紙

## Methods　方法

* 1. Fill the plastic bottle with 30 mL of 96% ethanol.  
     把30毫升的96% 乙醇倒入載有蘆薈啫喱的膠樽內。
  2. Use the stirring stick to stir the mixture for about 1 minute until most of the aloe gel is dissolved.  
     使用攪拌棒，攪拌乙醇和蘆薈啫喱約一分鐘，直至大部分蘆薈啫喱溶解。
  3. Add 2 mL of glycerol into the mixture by using the dropper provided.  
     利用滴管把2毫升的甘油加進混合液內。
  4. Stir the mixture for about 30 seconds, and that will be sufficient.  
     攪拌混合液約30秒即可。

## Risk Assessment / Control　風險評估 / 控制

* 1. Wash your hands thoroughly using detergent before and after the experiment.  
     實驗開始前和完結後，請用洗手液徹底清潔雙手。
  2. The chemicals may cause irritation if they come into contact with the eyes.  
     化學品或會刺激眼睛。
  3. Ethanol is a potentially hazardous chemical if ingested and absorbed through the mouth and eyes.  
     通過嘴巴/眼睛吸入酒精會引起潛在化學風險。