

EXPERIMENTAL TECHNIQUES  
AND LABORATORY PRACTICE  
BS7200-21-22

Component 1 assessment - SIT

# General indications and submission

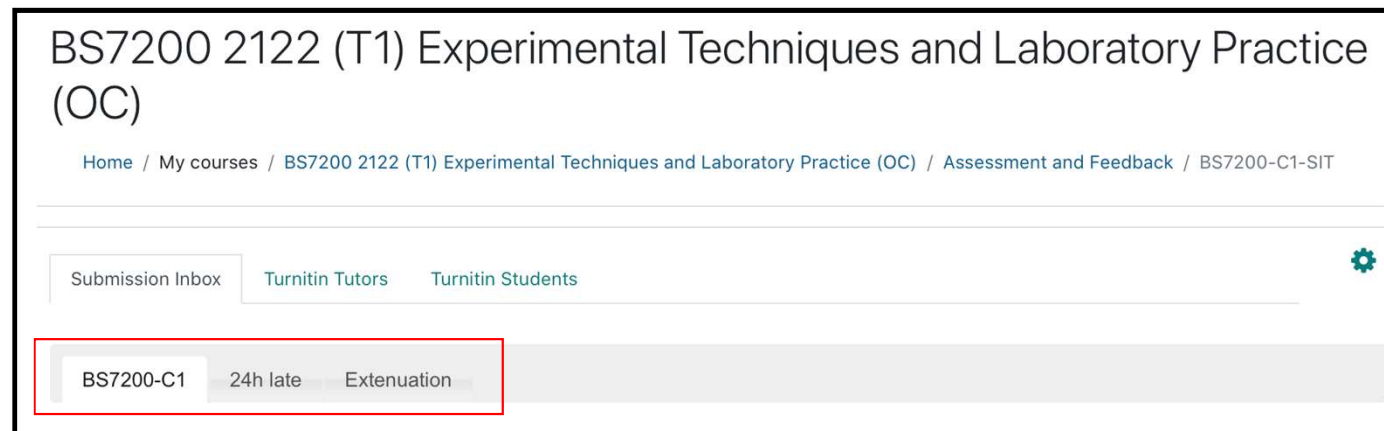
- a. The total higher word limit is 4000 words. For every 50 words above 4000 one point will be detracted from the final mark.
- b. The assignment must be submitted as single Word file within the 4<sup>th</sup> January 2020 at 16:00 through the Turnitin link provided in the BS7200 moodle –Assessments and Feedback Tab.
- c. The assignment file can be submitted a maximum of three times.
- d. The submission is available for 24 hour after the deadline. In case of later submission, five points will be detracted from the total mark of the component C1.
- e. Any kind of plagiarism or collusion must be strictly avoided. Whenever Turnitin finds evidence of plagiarism/collusion, this is shown as a percentage and will affect your mark or be considered as breach of academic regulations.

# Submission link

- Submission link in Assessment and Feedback folder



- 3 tabs of submission: use the appropriate one
  1. BS7200-C1
  2. 24h late
  3. Extenuation



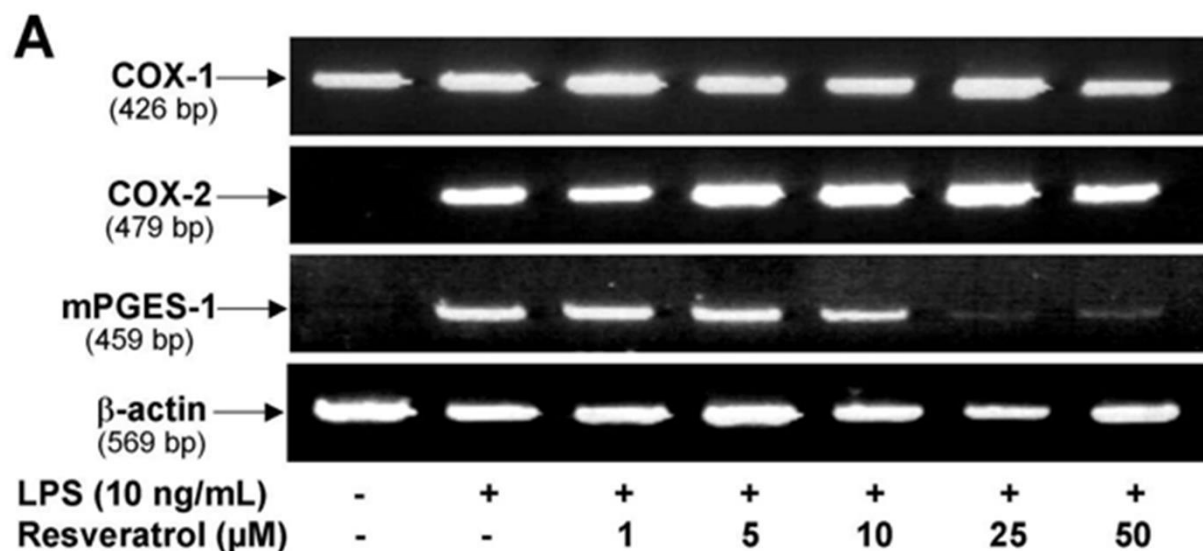
# BS7200-C1 assessment indications

**Pharmaceutical science course assessment.  
Complete all parts below.**

- CORE FIGURE, 40 marks (slide 5-6)
- PHARMACEUTICAL SCIENCE COURSE  
FIGURE 1, 50 marks (slides 7-11)
- PHARMACEUTICAL SCIENCE COURSE  
FIGURE 2, 10 marks (slides 12-13)

Separated files will be provided to the two Courses to avoid confusion.

# CORE FIGURE, 40 marks



**Figure 3A:** Representative photomicrographs showing RT-PCR products of COX-1, COX-2, mPGES-1, and  $\beta$ -actin mRNAs. Microglial cells were treated with LPS (10 ng/ml) in the absence or presence of different concentrations of resveratrol. The mRNA expression levels were tested for each condition. There is a constitutive COX-1 mRNA expression that is observed under all conditions. However, COX-2 and mPGES-1 are undetectable in untreated microglial cells, while their expression is dramatically increased in the presence of LPS. Resveratrol treatment significantly reduced mPGES-1, but not COX-2 expression. RT-PCR analysis was performed after 4 h of incubation with LPS. Resveratrol was added to the cultures 30 min before LPS.

Paper: **Candelario-Jalil, E., de Oliveira, A.C.P., Gräf, S. et al.** Resveratrol potently reduces prostaglandin E<sub>2</sub> production and free radical formation in lipopolysaccharide-activated primary rat microglia. *J Neuroinflammation* **4**, 25 (2007). <https://doi.org/10.1186/1742-2094-4-25>

# Guiding questions for Core figure

1. **Technique introduction (10marks):** Introduce the technique used to produce the figure highlighting the key points, the specific subtype of technique used, the purpose of the technique, the main steps of the technique, the pros and cons of the techniques.
2. **Figure interpretation (30 marks):** Provide and full and critical interpretation of the figure provided, including but not limited to:
  - A. the samples and genes/proteins analyzed,
  - B. eventual treatments or time-points,
  - C. the interpretation of any graphical representation (dots, bands, peaks, graphs, et cetera) including everything that leads to a complete understanding of the image.
  - D. The controls used (if they are missing, explain which controls you would expect and why)
  - E. The scientific message that can be understood from the figure.

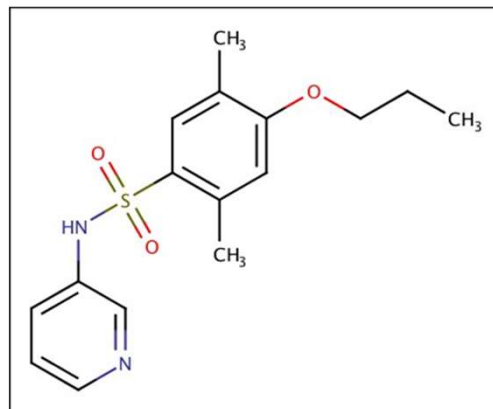
Please note: the points above are provided as a guidance, not as a Q&A type of assessment.

# PHARMACEUTICAL SCIENCE COURSE FIGURE 1, 50 marks

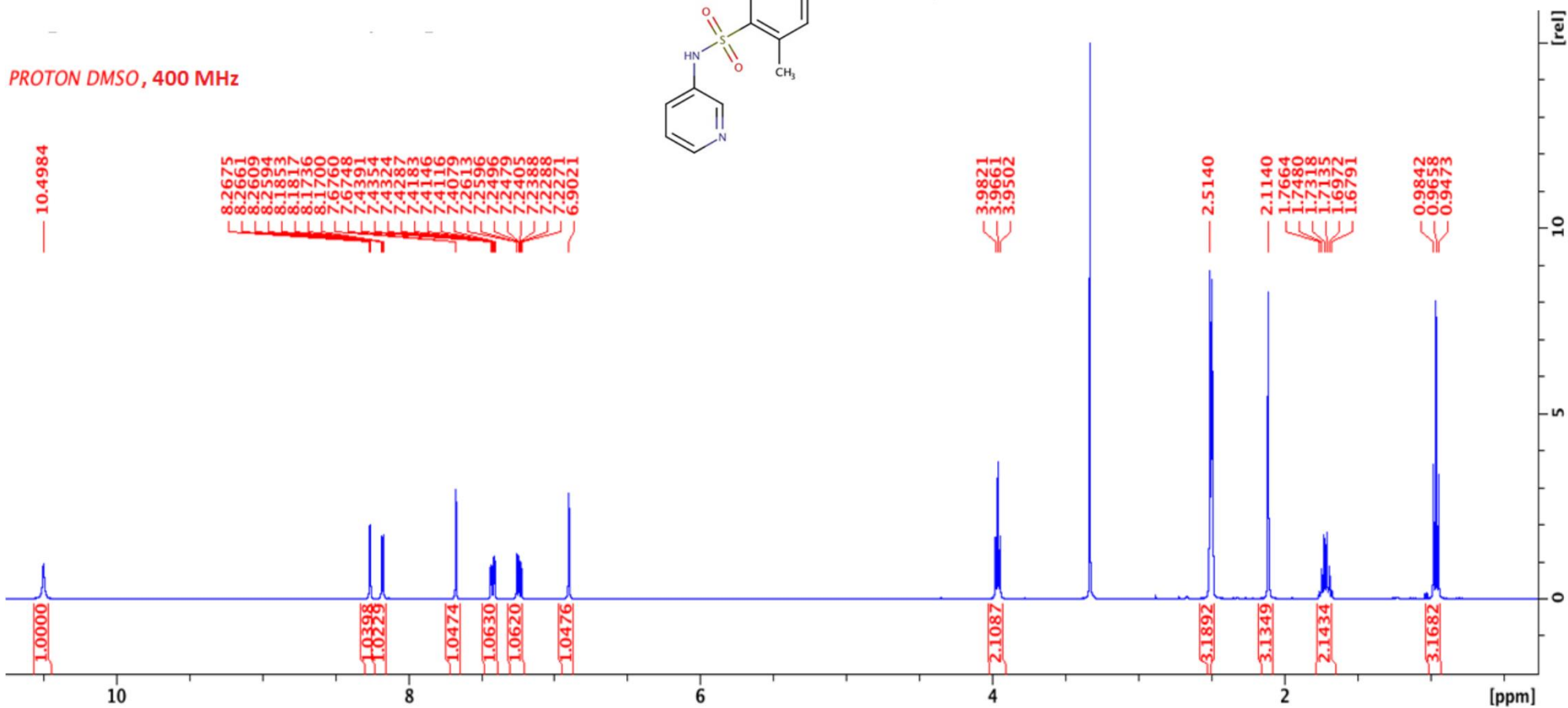
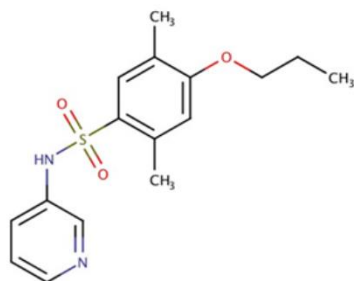
## Figure 1-A, 25 marks

You have been provided with  $^1\text{H}$ NMR spectra (Next slide) to answer the following question.

Assign the  $^1\text{H}$ NMR spectra (solvent:  $\text{d}^6\text{-DMSO}$ ) of the following compound. Explain the multiplicity of the signals in NMR spectra and justify all the assignments (25 marks)



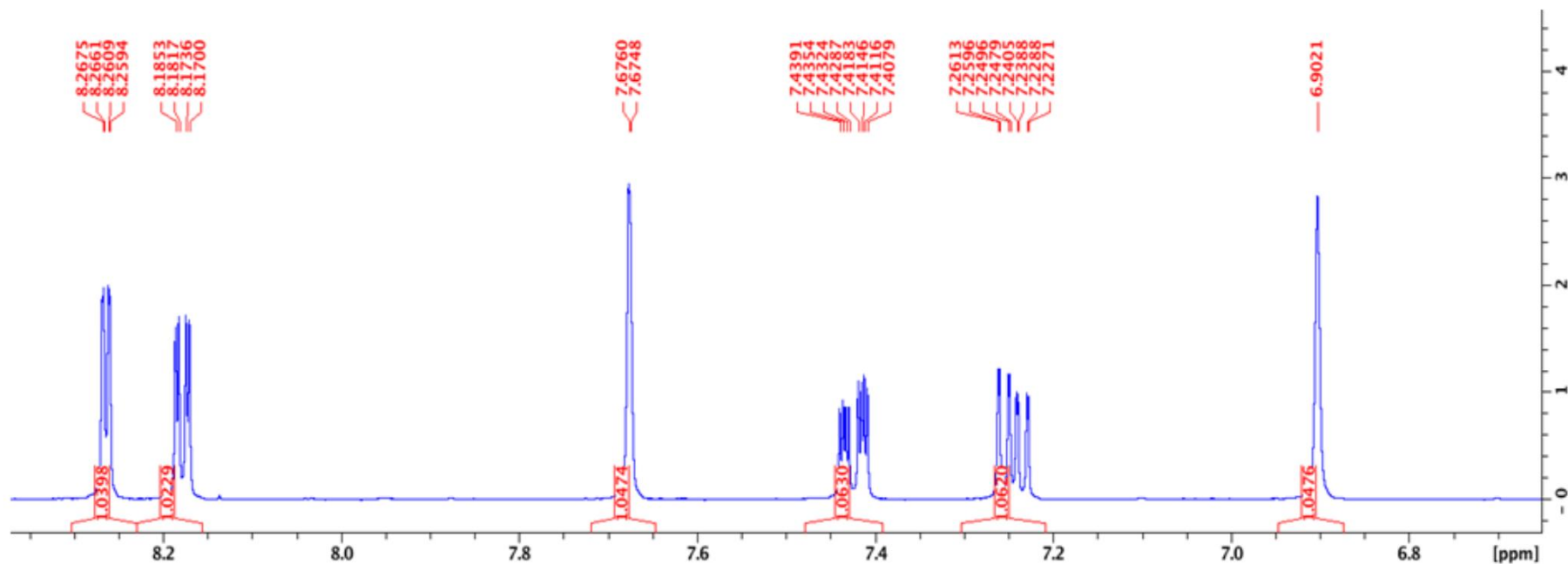
PROTON DMSO, 400 MHz



**Note:** DMSO and water peaks are not integrated



## Expanded region from 6.8 to 8.2ppm



## Figure 1-B, Effect of pH on drug absorption, 25 marks

This experiment illustrates the effect of pH on drug absorption in the human gastrointestinal (GI) tract. A model using aqueous solutions of different pH in contact with ethyl acetate is used to represent the GI tract. The stomach has an acidic pH (approx 1-3) and the large intestine has a basic pH (approx 8); the aqueous solutions represent the aqueous contents of different sections of the gastrointestinal tract and the ethyl acetate, which is immiscible with water, represents the lipid component of the tissue lining. The aqueous mixtures of the following drugs (Indomethacin, Ephedrine and Morphine) at different pH (1.0 and pH 8.0) were extracted with ethyl acetate. The ethyl acetate extracts are spotted onto a TLC plate and viewed under the UV light. Following observations were recorded (Table 1). Answer the questions in the next slide (25 marks).

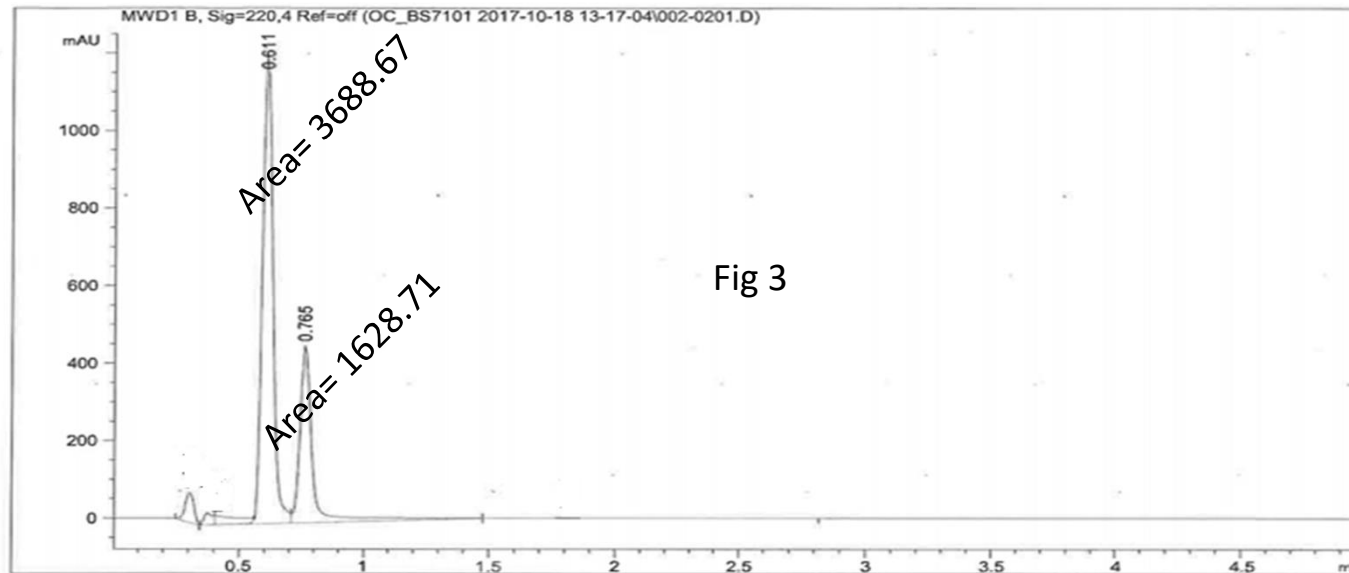
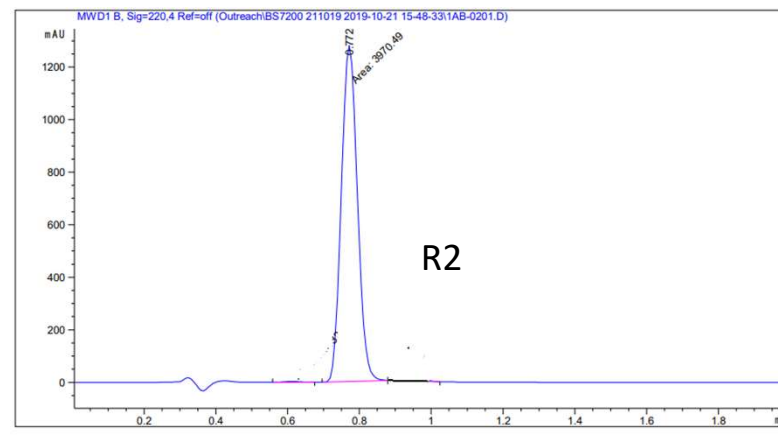
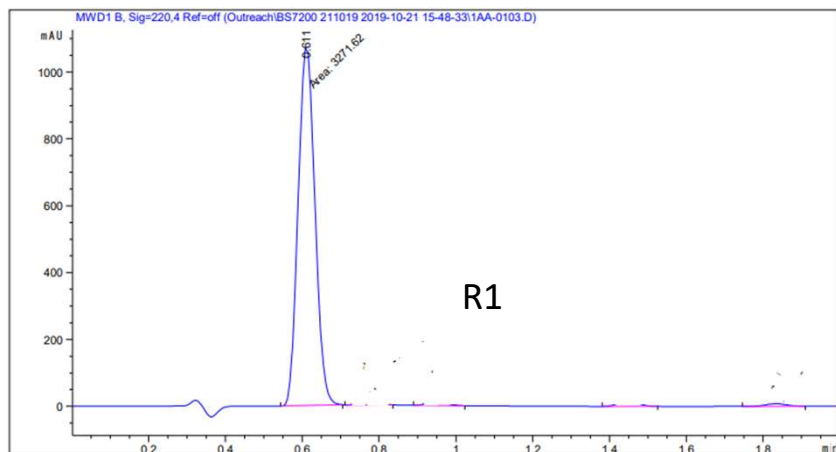
*Table 1. Results and observations*

	Appearance of spot (pH1.0)	Appearance of spot (pH8.0)
Indomethacin	Visible spot	No spot
Ephedrine	No spot	Visible spot
Morphine	Visible spot	Visible spot

## Guiding questions for Pharmaceutical Science Figure 1-B

1. Explain the result in Table 1 with Indomethacin, ephedrine and Morphine in terms of pKa and site of absorption? (5 marks)
2. Explain in your own words what will happen to the chemical structure of Indomethacin when it is in solution at pH 1.0. Compare this to what will happen to the chemical structure of Indomethacin at pH 8.0. Highlight your answers by drawing appropriate chemical structures for Indomethacin at each of the pH values (10 marks)
3. Explain the result with ephedrine at pH 8.0. If appropriate Include a chemical equation which shows the conjugate acid and/or base formed by ephedrine at pH 8.0. Draw and label the predominant structures of ephedrine at pH 1, pH 7 and pH 10 (10 marks)

# PHARMACEUTICAL SCIENCE COURSE FIGURE 2, 10 marks



## Guiding question for Pharmaceutical Science Figure 2

Imagine you are working as an analyst in a pharmaceutical company where you have been assigned to check the identity and purity of aspirin that was received from an overseas company. You prepared standard aspirin, standard salicylic acid and the sample you received. Both standards (R1 and R2) and sample (S) were run using UPLC which gave the chromatographs shown below in the previous slide. Answer the following questions based on the chromatographs in the previous slide:

- (a) Identify aspirin and salicylic acid in Fig 3. Calculate the level of impurities.
- (b) Based on retention time which one (aspirin and salicylic acid) was eluted first and why?

# Marking

Your assessment will be marked by different academic staff depending on the Course and Part. The collected marks for each part will be summed up providing the final mark:

- Core Figure: 40 marks
- Course specific Figure 1: 50 marks
- Course specific Figure 2: 10 marks
- Total: 100 marks

Eventual deductions for excessive word count, similarity score and 24h-delay submission will be included in the calculation.

# Final mark and resits

- A minimum overall mark of **50** is required to pass the module and a minimum of **40** in each component.
  - 50-100% → passed component
  - 40-49% → qualifying mark for the component (the mark depends on the weighted mean with the other component)
  - <40% → failed component
  - The weighted average will determine the final BS7200 mark:  
 **$(C1 \times 0.6) + (C2 \times 0.4) = \text{BS7200 mark}$**
- **Case 1:**  
 $(100 \times 0.6) + (100 \times 0.4) = 60 + 40 = 100$   
 $(80 \times 0.6) + (65 \times 0.4) = 48 + 26 = 74$
- **Case 2:** If one component is 40-49, it can be pass-compensated by the mark of the second module if it is high enough  
 $(60 \times 0.6) + (46 \times 0.4) = 36 + 18.2 = 54.2 \rightarrow \text{module passed}$
- **Case 3:** If one component is 40-49 and cannot be compensated → resit only the failed component  
 $(50 \times 0.6) + (46 \times 0.4) = 30 + 18.2 = 48.2 \rightarrow \text{C2 failed} \rightarrow \text{resit C2}$
- **Case 4:** If one component is 0-39 → resit component

- Turnitin checks for similarity with
  - Published text (scientific papers, websites on any kind, etc)
  - UEL records (other student's submitted papers, present or past)
- Any evidence of copying from other sources in order to fill up one assignment is taken very seriously and will affect your final mark
- High levels of similarity are the most common reason for failed written assessments.

The image shows three examples of Turnitin Match Overview windows. Each window displays a list of sources and their respective similarity percentages. A blue arrow points from each window to a corresponding text description below it.

Match Overview	Similarity Percentage
1 Submitted to University... 2 www.ppt.org 3 N. V. Chandrasekharan... 4 anata.france.z.wiki... 5 iella.helsinki.fi 6 Submitted to University... 7 www.researchgate.net 8 iisr.caf	12%
1 Submitted to University... 2 www.phozone.org 3 bloodjournal.hematol... 4 www.ambionline.org 5 journal.frontiersin.org 6 iinknowp.com 7 www.pmc.ncbi.nlm.nih.gov	31%
1 wet-lupe.edu 2 Mathew Anandavel... 3 www.researchgate.net 4 academic.hep.com.cn 5 doctype.net 6 Lipton, Arthur G., "Doc... 7 Alina L. Hart, Miranda L... 8 drug.org	88%

Very little:  
Minimally (or doesn't)  
affects the mark

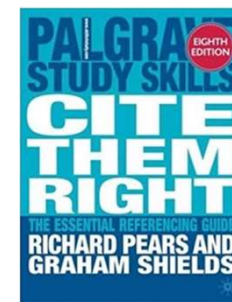
Medium level:  
Affects the mark but not massively  
(may fail or not, depending on the  
overall quality)

High level:  
Fails the component +  
academic breach



Common reasons for plagiarism	How to avoid
Running out of time to double check the research before submitting an assignment.	Use effective <b>time management strategies</b>
Relying on incomplete notes.	Make use of the <b>reading and note-taking strategies</b> available
Neglecting to do enough research, or putting it off until it's too late to start researching.	Follow the <b>advice on writing assignments</b> and time management
Misinterpreting the question and researching irrelevant information. In this situation, someone might fabricate the ideas to make up for gaps in their knowledge.	See <b>the advice on writing</b> , and <b>seek help</b> from your tutor, lecturer and <b>Academic Skills</b>
Insufficient paraphrasing	Check out the information on using sources, and make use of the Turnitin site.
Incorrect referencing	Consult a text on <b>referencing</b>

Consult **Cite them right: The essential referencing guide (Palgrave Study Skills)**  
by R. Pears & G. Shields



**Repeated evidence of plagiarism (in the same or in different modules) may eventually lead to exclusion from the university**