



運用互動教學模式以增進EMI教學之學習成效 -以藥物設計與開發為例

報告人: 皇甫維君
臺北醫學大學 癌症生物學與藥物研發研究所
計畫編號: PAG1136669



簡報內容大綱

1. 背景與動機
2. 教學理念與目標
3. 課程設計
4. 教學方法
5. 學習成效評估
6. 未來展望及反思

背景與動機

- 國際醫藥產業人才的需求
- EMI 在非英語母語國家的挑戰
- 藥物設計與開發的重要性：藥物標靶選擇→藥物篩選→優化→臨床前評估...etc.



課程準備前期學生訪談

Q1. 你認為什麼樣的教學方式是你比較有興趣的？

學生A: 我覺得在課堂中可以跟**老師與同學有互動**是一件有趣的事。這可以讓我在互動的過程中，從不同的角度了解整個藥物開發流程。

學生B: 在課堂上可以和同學一起討論跟藥物相關的知識很好玩。這樣應該可以讓我更了解這個領域在幹嘛。

Q2. 你在本課堂最想學到什麼？

學生C: 希望知道更多的研發方法和**真實案例還有藥廠的實際運作模式**。

學生D: 因為我以後想往藥物的行銷或專利方面繼續努力，所以如果可以多增加這方面的課程應該也不錯。

Q3. 你覺得參訪藥廠對於你的學習有幫助嗎？

學生E: 因為我自己本身就對畢業後去藥廠工作很有興趣，所以我覺得如果可以實地去藥廠了解員工每日從早到晚到底在做什麼會很棒。而且我腦中已經有好多想問的問題！

學生F: 感覺應該有幫助，因為在課堂上單純以講述的方式講解藥廠運作可能不是很直觀的理解，而**直接到藥廠內部上課**應該可以解決這個問題。

Q4. 你覺得增加讓同學課堂討論的內容對於你的學習有幫助嗎？

學生G: 如果可以**把一般老師單純講課的時間縮短**，然後**增加討論的時間**應該會很有幫助，因為有很多觀念需要反覆思考才會想通。

學生H: 我覺得可以做一個課後的**線上討論平台**，因為我自己覺得有時候想討論的東西太多了，單單在課堂上沒辦法全部都討論到，所以有平台的話就可以不侷限於課堂才能討論。

教學理念與目標

- 互動式教學，培養學生專業英語能力與國際競爭力
- 由基礎至進階，循序漸進，與實際場域結合，誘發學生學習動機

藉由落實本計劃設計之EMI教學實踐，讓學生自然而然習慣並在課程中藉由討論等課程活動使用英語，習慣雙語環境，並不因為語言的問題影響其對於智識的吸收，引起學生學習動機，培養思考習慣，持續自主深入學習，成為有決策及分析能力，解決問題的人才。

課程設計

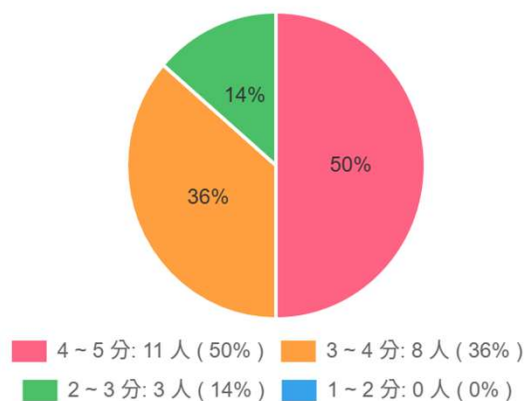
- 運用ADDIE模型培訓開發EMI課程
- 理論面：標靶選擇與篩選、電腦輔助設計、藥物優化
- 應用面：奈米藥物傳遞、臨床前毒理試驗、眼科用藥開發、生物相似物分析、專利布局、市場分析
- 產業鏈結：Eurofins 實地參訪
- 跨國共授：邀請國內外專家學者



期初問卷

Pre-Course Questionnaire

問卷結果分布



評分量表各題的平均分數

How would you rate your understanding of drug design and development?

3.0

Do you have a positive attitude toward using English as the medium of instruction?

4.5

Do you feel that your English proficiency is sufficient to meet the demands of professional learning?

4.0

Have you actively engaged in discussions with classmates and collaborated to solve problems in previous courses?

3.9

What challenges do you anticipate encountering during the learning process?

已填寫 100%

22 / 22

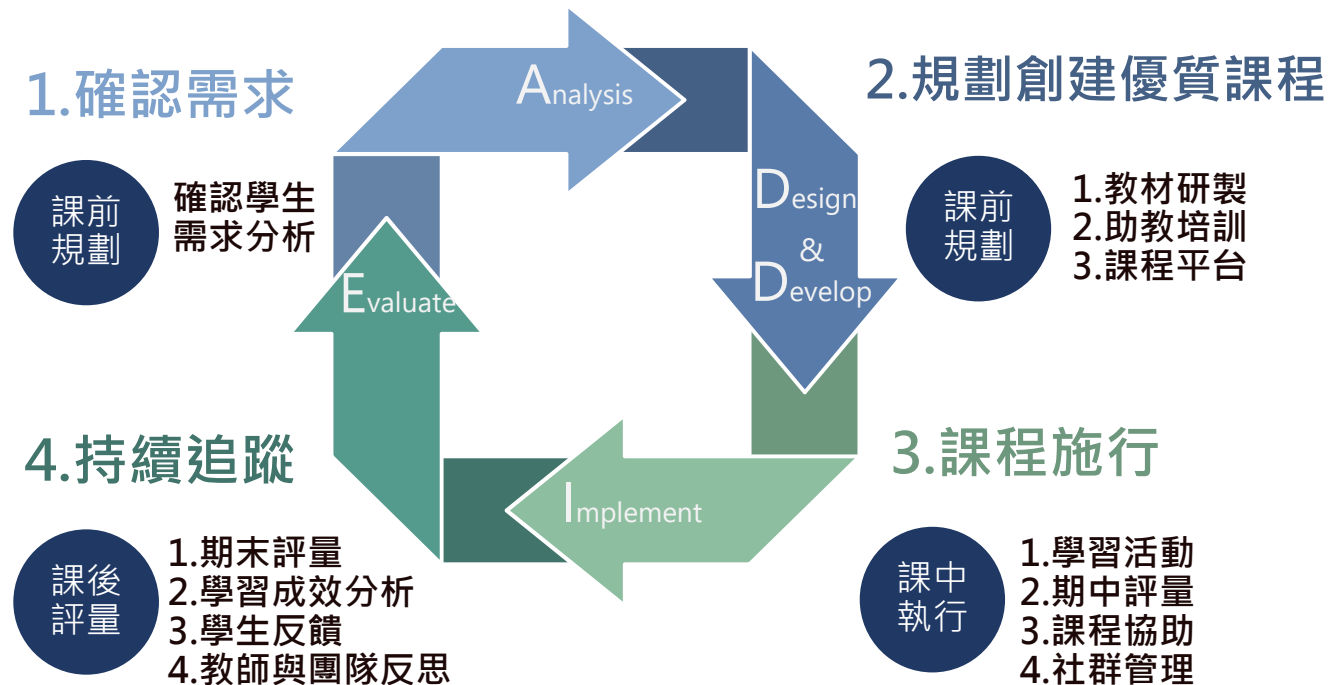


1. [redacted]
1. A non-defined structure in learning makes me lose track. 2. If the learning doesn't come with a deadline, I become lethargic to finish it. 3. If there are no daily life examples to understand the concept easily during the learning process, it becomes difficult to remember in the long term.
2. [redacted]
I haven't encountered it yet, looking forward to learning it in future courses.
3. [redacted]
My English is not very good, so I might need more time to learn
4. [redacted]
The technical aspects of drug design.
5. [redacted]
Finding groupmates
6. [redacted]
1. presenting opinions and discussing completely in english 2. interacting with the speakers
7. [redacted]
One of the challenges I anticipate is learning new concepts in drug design and development, as this field involves complex mechanisms, computational approaches, and various stages of drug discovery that I have not studied in depth before. However, I see this as an opportunity to expand my knowledge and apply these principles to my research in cancer therapy.
8. [redacted]
I find it challenging to keep up with informations that are not from my background
9. [redacted]
The introductory lecture on drug design and development course present fascinating topics in the world of drug design and development. Based on my experience in the first lecture, I anticipate a positive and productive learning experience.
10. [redacted]
英文能力不太好，有些部分可能會聽不懂 老師問問題時，可能會聽不懂老師的提問
11. [redacted]
I might have issues understanding the pharma industry market.
12. [redacted]
English proficiency might not be enough to understand the information during the learning process comprehensively.

13. [redacted]
Learning new concept in drug development from lab to market since I've now been very familiar with that area of science. But with the insightful introductory class today, I am daring to go
14. [redacted]
The complexity regarding to the drug design.
15. [redacted]
A challenge I foresee is managing my time effectively while balancing coursework and other responsibilities (such as lab work). To address this, I will create a structured study schedule and timeline that is updated every time to maintain productivity and stay on track.
16. [redacted]
None
17. [redacted]
無
18. [redacted]
英文能力不足
19. [redacted]
nil
20. [redacted]
Some challenges that I may encounter during the learning process are staying focus and engaging in the discussion since I am usually too shy to speak up.
21. [redacted]
Because the topic of drug design and development is not very familiar to me, I'm worried that specialized vocabulary might make it hard for me to understand the lectures.
22. [redacted]
There may be confusion about the professional terms of drug development in the course, as well as the professional tools.

EMI課程設計

運用ADDIE模型培訓開發適合EMI課程



課程綱要

由基礎至進階，循序漸進

藥物設計與開發(研究所/EMI)	
周次	授課主題
1	藥物設計簡介
2	標靶選擇與藥物篩選
3	電腦輔助藥物設計
4	結構為主的藥物設計
5	藥物最佳化
6	小分子新藥開發與設計
7	奈米藥物傳遞
8	眼科用藥之設計開發
9	期中考
10	生物相似藥
11	臨床前毒理試驗
12	動物藥理藥效評估
13	新藥法規暨藥品查驗登記
14	專利佈局
15	藥物市場分析
17	Eurofins 參訪
18	期末報告

前往實際場域教學



評分方式

核心能力比重	核心能力		比重
	癌症生物學及藥物研發之專業背景知識		20%
	批判性思維和實證醫學研究能力		15%
	國際視野與溝通技能		20%
	癌藥研發科技跨領域整合能力		20%
	臨床轉譯技能		15%
	人文素養及社會實踐能力		10%
評分方式	評分方式		比重
	出席率		30
	其他-上課發問參與討論		30
	個人報告		30
	作業		10

課程教材-結合實例

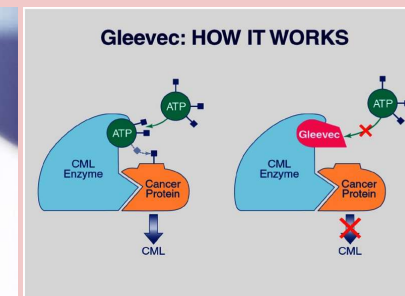
唐獎
TANG PRIZE



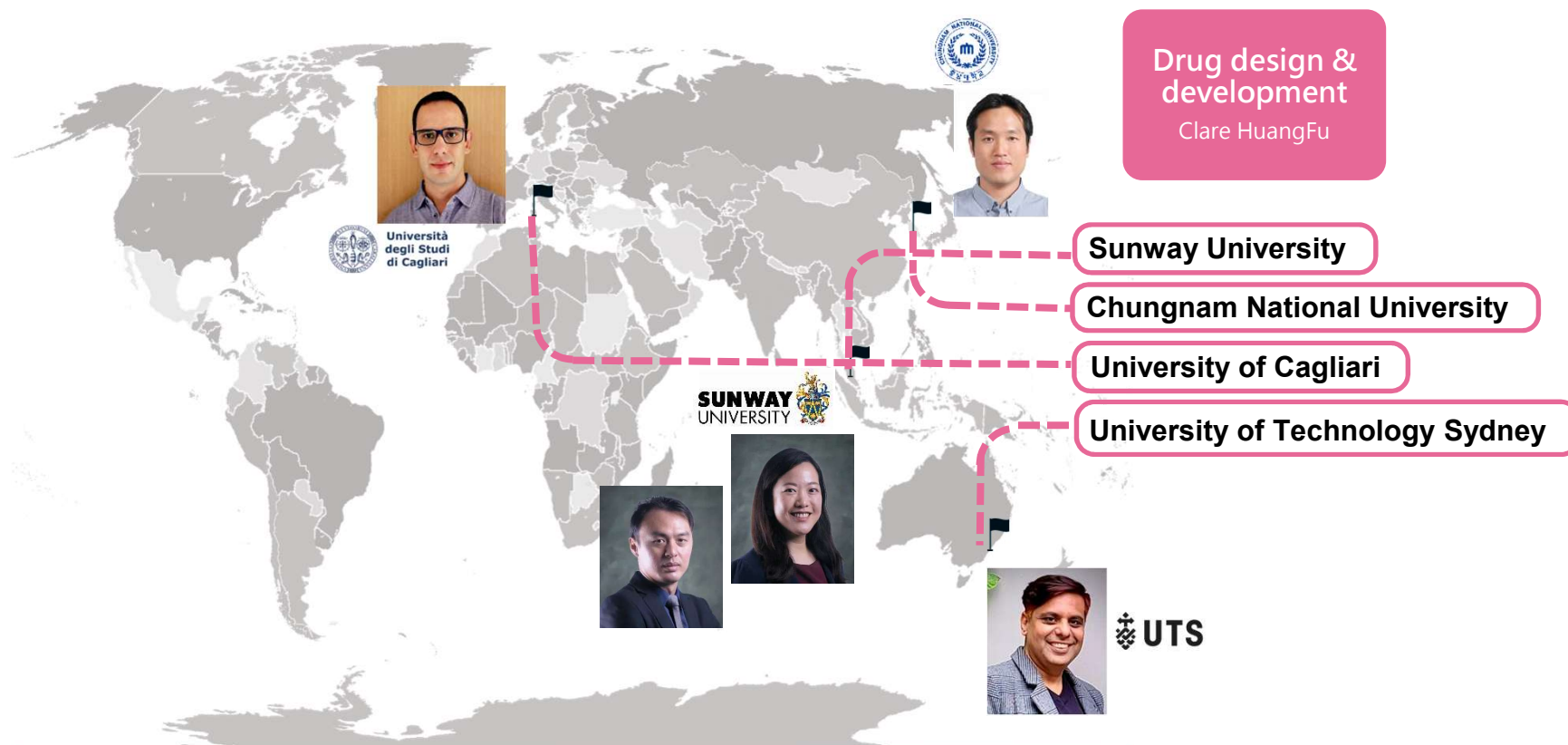
Dr. Brian Druker, Director of Oregon Health Sciences University Knight Cancer Institute, is the physician-scientist who **led the successful clinical trial of imatinib (Gleevec®) on chronic myelogenous leukemia (CML)**, which opened up the field of TKI as targeted therapy. **Gleevec shuts off oncogenic signals by inhibiting Abl tyrosine kinase (translocated as Bcr-Abl oncogene in CML)**, as predicted by Tony Hunter's original hypothesis. Abl is a tyrosine kinase, the gene of which, upon translocation to a different chromosomal site, becomes constitutively active.

Gleevec inhibits three related tyrosine kinases:

- .Abl kinase ;
Apparently pathogenetic in t9:Q22 (Ph+) CML/ALL
Absence in normal tissues
- .C-kit receptor tyrosine kinase ;
- .PDGF-Ra as well as PDGF-Rb tyrosine kinases



開設國際共授EMI課程



邀請海外學者分享授課



Novelty in Model of Experimentation & MoA

Well known local folk medicine
No real scientific report (libido)
Extensive chemical analysis & studies have been done

上午10:25 | Drug Design

MAN THI NGUYEN TMU
Sachin
TMU黃巧穎
TMU方金于庭
CHIOMA GRACE ENWOLO...
Wei-Chun HuangFu

許凱程
William
RACHEL RADITYA RENA...
Wei-Chun HuangFu

上午10:13 | Drug Design and Developme...

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#tmutw



When I taught my class....

- Students sit in a meeting room (are they all engaged?)
- I explained the course materials with PPT (do they all follow?)
- When I ask any questions, most of them keep silent (do they all understand?)

Can I do better as an EMI instructor ???

教學方法

- 互動式教學：ImTMU線上平台、案例討論、小組活動
- EMI + PBL：實際問題導向學習
- IRF 模式 (Initiation–Response–Feedback)
- HOT (Higher Order Thinking) Questions 問題設計
- 減少TTT (Teacher Talking Time)



What am I going to do in my class....

- Students sit in a meeting room (are they all engaged?)
→ **Re-arrange the seating and student grouping**
- I explained the course materials with PPT (do they all follow?)
→ **reduce TTT, use IRF, and ask HOT questions to students**
- When I ask questions, most of them keep silent (do they all understand?)
→ **IRF, student group (discussion) to check comprehension**



標題	期限	完成條件
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[W1] 2/19 Introduction of Drug Design and Development (Clare HuangFu) + ⋮

Dear Students,

Welcome to the new semester and thank you for enrolling in this course!

The course will take place **10:10 am-12:00 pm** at TMU ShuangHo Campus, Teaching and Research Building, **8F, 1st Meeting Room**. Hope to see you all there!

Best regards,

A-Pan & Clare

- | | | | | |
|---|---|--------|-----|---|
| 1. 📄 Introduction for Drug Design and Development | - | 閱讀 1 次 | 96% | ⋮ |
| 2. 📄 Nature Reviews Drug Discovery | - | 閱讀 1 次 | 91% | ⋮ |

[W2] 2/26 Target validation and drug screening (Clare HuangFu) + ⋮

- | | | | | |
|---|---|--------|-----|---|
| 1. 📄 0226 Target validation | - | 閱讀 1 次 | 91% | ⋮ |
|---|---|--------|-----|---|

[W3] 3/5 Computer-aided drug design (Gene Chen) + ⋮

- | | | | | |
|---|---|--------|-----|---|
| 1. 📄 Computer-aided drug design | - | 閱讀 1 次 | 91% | ⋮ |
|---|---|--------|-----|---|

[W4] 3/12 Small molecular drug design and development (Nicki Li) + ⋮

- | | | | | |
|--|---|--------|-----|---|
| 1. 📄 Small molecular drug design and development | - | 閱讀 1 次 | 91% | ⋮ |
|--|---|--------|-----|---|

[W5] 3/19 Drug optimization (Kelvin Tsou) + ⋮

- | | | | | |
|--|---|--------|-----|---|
| 1. 📄 Drug optimization | - | 閱讀 1 次 | 87% | ⋮ |
|--|---|--------|-----|---|

[W6] 3/26 Design and Development of Topical Ophthalmic Drugs: From Idea to Medicine (Sandy Lai) + ⋮

- | | | | | |
|--|---|--------|-----|---|
| 1. 📄 Design and Development of Topical Ophthalmic Drugs: From Idea to Medicine | - | 閱讀 1 次 | 87% | ⋮ |
|--|---|--------|-----|---|

[W7] 4/2 Special lecture (Goh Bey-Hing) + ⋮

A Researcher's Journey: Connecting the Dots and Perspective Sharing

- | | | | | |
|---|---|--------|-----|---|
| 1. 📄 4/2 special lecture | - | 閱讀 1 次 | 87% | ⋮ |
| 2. 📺 Sunway University : Campus Fly Through | - | 閱讀 1 次 | 74% | ⋮ |

[W8] 4/9 Special lecture (Kamal Dua) + ⋮

Blending Nanoparticle Approaches and Immunology in Designing Advanced Delivery Systems

- | | | | | |
|--|---|--------|-----|---|
| 1. 📄 Recent trends of NFκB decoy oligodeoxynucleotide-based nanotherapeutics in lung diseases | - | 閱讀 1 次 | 78% | ⋮ |
| 2. 📄 Anticancer activity of NFκB decoy oligonucleotide-loaded nanoparticles against human lung cancer | - | 閱讀 1 次 | 78% | ⋮ |
| 3. 📄 (Class slides) NanoTechnology: From Basic Research to Nanomedicines: Targetting Inflammatory Diseases | - | 閱讀 1 次 | 83% | ⋮ |

[W9] 4/16 RA perspective: CMC in New Drug Development (Julia Lin) + ⋮

- | | | | | |
|--|---|--------|-----|---|
| 1. 📄 RA perspective: CMC in New Drug Development | - | 閱讀 1 次 | 83% | ⋮ |
|--|---|--------|-----|---|

[W10] 4/23 Preclinical toxicology study (Charlene Chen) + ⋮

學習成效評估

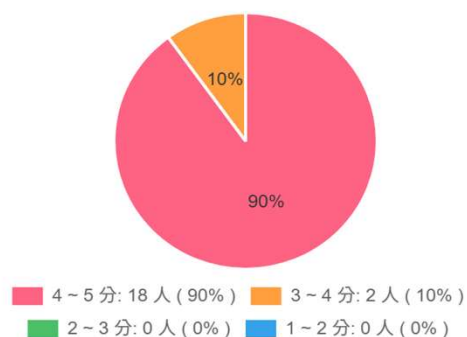
- 學生學習成就
- 專業英語能力提升
- 批判思考與團隊合作能力養成
- 問卷前後測 + 課堂互動回饋

期末問卷



Post-Course Questionnaire

問卷結果分布



評分量表各題的平均分數

Do you feel your understanding of drug design and development has improved?	4.9
Has your professional English proficiency improved?	4.3
Did the weekly seat rotation help promote peer interaction and discussion?	4.1
How satisfied are you with the course design, which combines fundamental concepts, applications, and site visits?	4.9
Has this course contributed to your professional development?	4.6
Do you plan to continue learning about related topics after the course ends?	4.6
How would you rate your overall learning experience in this course?	4.8

學生回饋



15. [redacted]

I would like to thank Professor Pan and Professor Huang Fu for organizing this course. Their punctuality and timely reminders are very valuable. This course has benefited me a lot, especially the part about off-campus visits. The actual visits jumped from books to the real world, which was even more impressive.

16. F. [redacted] L:

I thank the lecturers for bringing in different types of pharmaceutical experts to shed light on various drug discovery processes beyond focusing solely on Cancer biology.

17. I. [redacted]

The course is well structured and the invitation of guest lecturers who are experts in their respective fields makes it more exciting. Professor Claire on the other hand is such a passionate teacher and carried everyone along during the course. One of the best courses I have offered so far.

18. [redacted]

In addition to small-molecule drugs and ADC, the potential of other biologic therapeutics such as monoclonal antibodies, bispecific antibodies, and fusion proteins can also be considered, as they represent an increasingly important modality in this field.

19. [redacted]

From case studies to emerging technologies, the learning experience both engaging and practical. Would recommend other students to join this course.

20. F. [redacted]:

All the speakers are experts in their field, making the session easier to understand. Furthermore, Prof. Claire encourages students to ask questions and having discussions.

Dear Prof. Claire,

Good morning:)

This course: Drug Design & Development is highly insightful, broadening my understanding of drug development and the horizon view within the pharmaceutical industry. It improves my knowledge especially from the following perspectives:

1. **Financial demands:** Drug development is costly, especially during clinical trials, making strong funding essential.
2. **Regulatory compliance:** Success requires strict adherence to global standards such as GLP, GMP, GCP, and IND submissions.
3. **Strategic planning:** Clear vision, expert input, and adaptable planning are critical for project success.

Overall, this course has not only deepened my knowledge but also provided a more comprehensive perspective on the complexities of the pharmaceutical landscape. Finally, I would like to express my heartfelt gratitude to the course coordinators, Prof. Dr Wei-Chun, Huang-Fu and Prof. Dr Shiow-Lin, Pan, and everyone for organizing this course.

Thank you and have a nice day.

Best regards,

[redacted]

Dear Prof. Claire,

Despite the heavy traffic, the Eurofins visit last Wednesday was extremely informative. The lecture, along with guided lab tours of both in vitro and in vivo laboratories, provided valuable insights, especially since I would like to pursue a career in the pharmaceutical industry in Taiwan. I was particularly intrigued by the animal facilities since I have never worked with in vivo models before. Thank you for organizing such an educational and engaging experience. I would love to participate in another company visit in the future if the opportunity arises.

Best regards,

[redacted]

課程內容實用、結構清晰
課堂互動增加英語表達力

課程評量結果

一、當學期評量分數(僅計算「課程評量：對學習的意見」)

	平均分數
評量平均分數	4.73

前5%平均分數	5
前10%平均分數	4.839
前20%平均分數	4.733
前50%平均分數	4.54
前80%平均分數	4.316
前90%平均分數	4.156
全校落點分析	20.75%

Course content is highly commendable

Excellect class! The collabrution with industrial experts really help me to earn more insights and persepectives from the important partners.

Nil

Prof. Clare explains the lecture clearly and in an organized manner. She also always encourages students to ask questions and participate actively in class.

Professor Claire is a passionate teacher. Eager to answer all questions and always willing to help.

Easily the best professor this semester

The professor is very dedicated to preparing and delivering lectures, and is always enthusiastic and supportive throughout the learning process.

Easily the best course for the semester. The delivery of the lectures and the quality of guest lecturers are top notch. Prof Claire is passionate. Overall, the course provides exciting insights about drug discovery and development processes from the bench to the clinic.

Great class with good collaboration with industrial experts to make students obtain the broader view of drug developement process.

I gained the deeper insight into drug development pipeline, drug marketing analysis, CMC in New Drug Development etc.

I think it is a great course

The course allows students to deepen their knowledge in different fields, especially about how the industry works as in each session, different speakers in different field offer valuable insights about their expertise. Moreover, the students also can learn not only from the speaker but other students as this class has so many different backgrounds. The company visit event was really insightful and informative.

The course is highly commendable

很滿意，真的很棒！

課程探討藥物設計與開發的完整流程，內容專業而具實用性。每周講師具備豐富的業界經驗，能以實例輔助理論，讓學生更易理解複雜概念。課程安排合理，結合理論與實際經驗，對未來從事藥物研發大有助益。

未來展望及反思

- 成為 EMI 標竿課程，推動雙語教育
- 強化產業鏈結與國際合作
- 提升學生國際競爭力
- 持續優化教學模式與內容



In addition, I try to:

- Check students' **backgrounds and English levels** at the beginning of the course → so I can group the students more effectively
- Use the classroom with **movable furniture** → to easily group students, and students could contribute their thoughts to the class
- **Prepare HOT questions** before the class → so students can really learn through thinking and integrating their knowledge
- Use **pauses** and **stress** while delivering the content → to help students understand the important information
- Train a **TA** to help my class → so students may feel less stressed interacting with the TA
- Have a trusted colleague **sit in my class** → to give me objective feedback and suggestions



As an EMI instructor, I need
practice, practice, and practice.
Practice makes perfect!

The true reward and success of a
teacher: **Inspire** students to have
intrinsic motivation and **be the**
best version of themselves.

EMI 教師增能





敬請指教