

開創資料驅動的創新學習與實踐模式

與時偕行——

研究支援服務實踐

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國立臺灣大學圖書資訊學系

2021.04.28

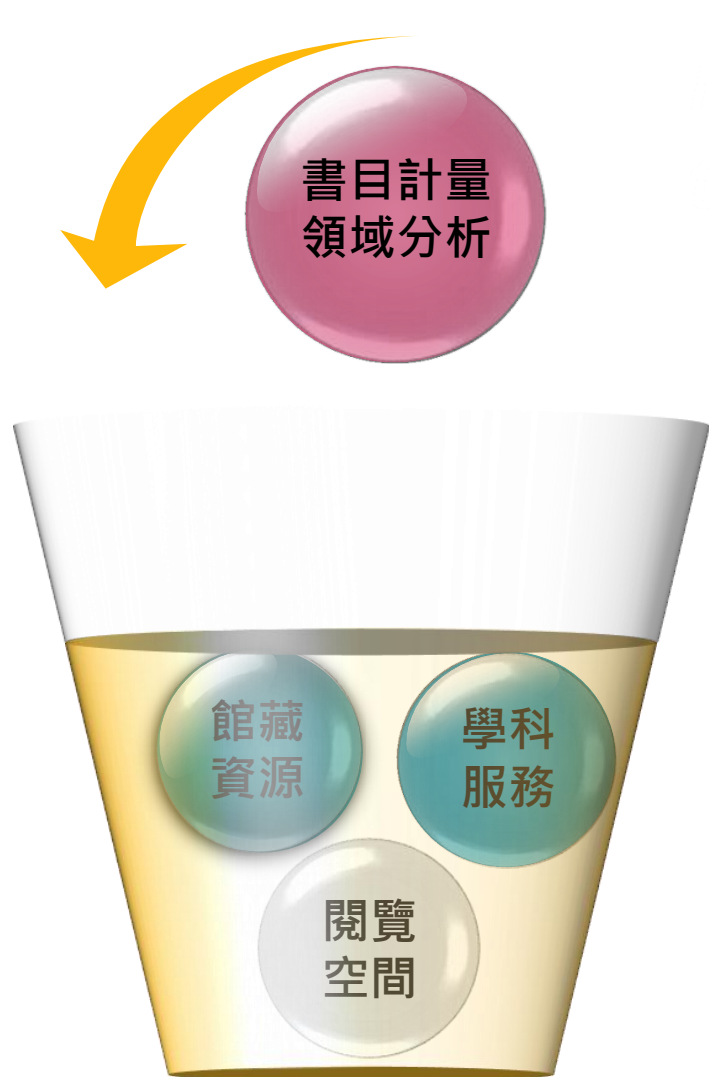


SINCE 1928



 國立臺灣大學圖書館

目標



• 現有基礎

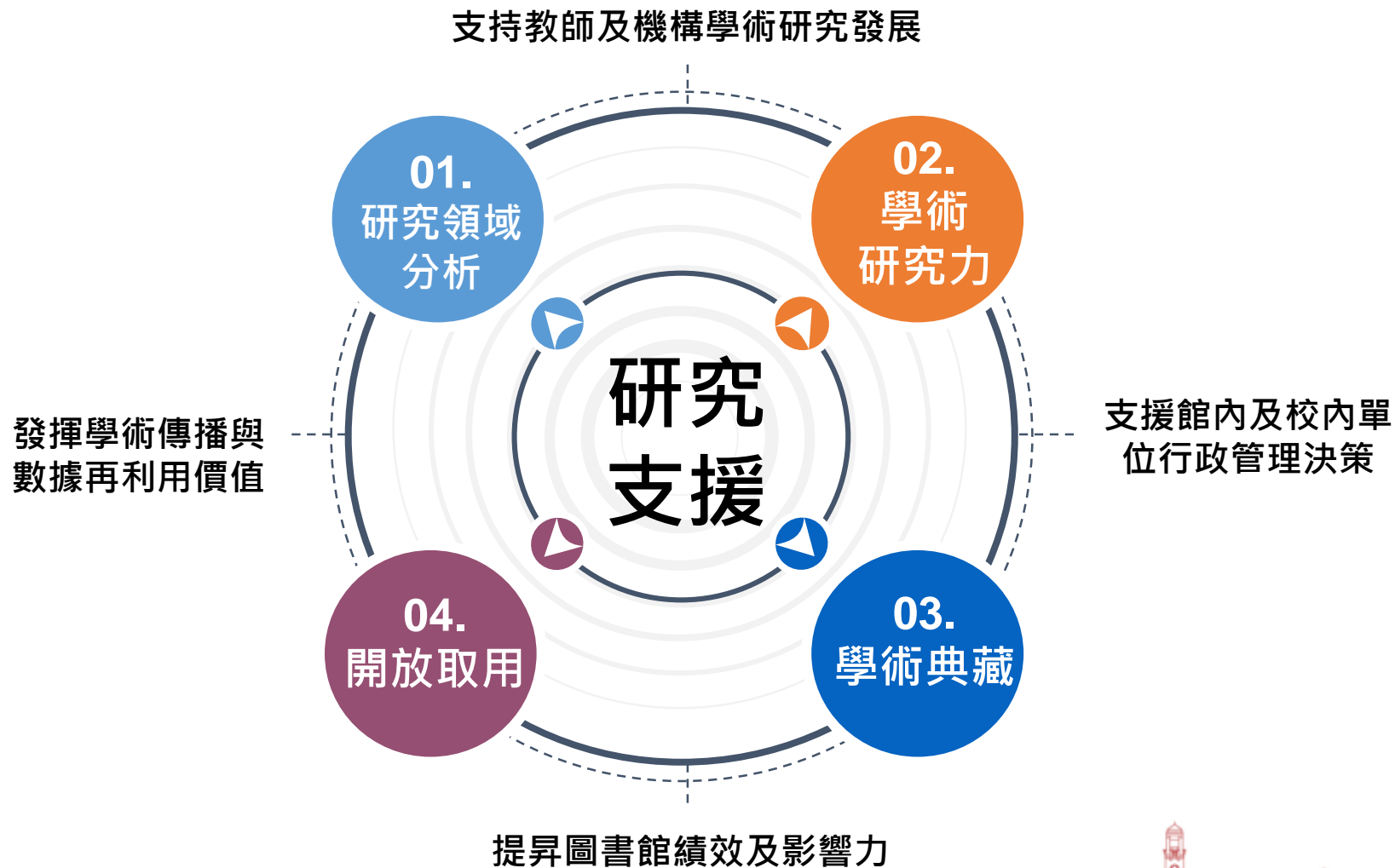
包含研究空間支援、館藏採購及館際合作文獻傳遞等資源提供、資訊素養利用指導、書目管理工具、機構典藏等。

• 未來發展

結合研究生命周期各階段需求，推動本館可行的開創及深化的研究支援服務策略。



服務策略



01. 研究領域分析

概述

結合社會網絡與引文分析技術，於2018年11月正式推出「Domain Network Analysis Service」(簡稱 DNA 服務)，以視覺化圖形協助教師快速掌握研究領域發展。

01 Co-words

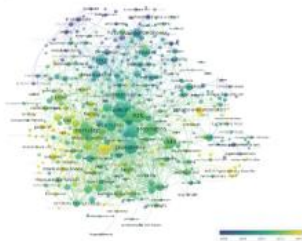
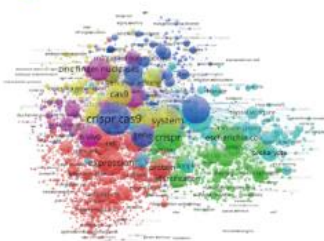
共現詞分析

兩篇文獻若使用相同的字詞，則產生共現詞關係 (co-occurrence words, 簡稱co-words)；共現詞越多則主題關聯性越高！

Author Keywords / All Keywords

例 CRISPR 作者關鍵字

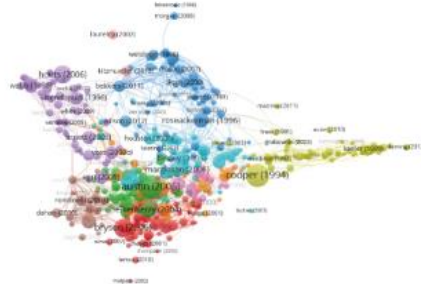
例 流預所共現詞的年代分布圖



02 Bibliographic coupling

書目耦合分析

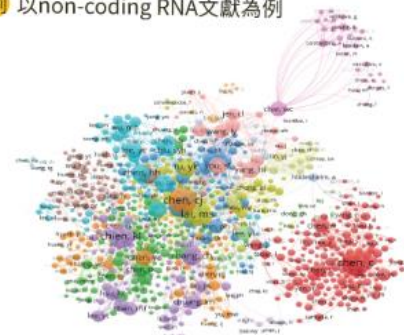
兩篇文獻若引用共同之參考文獻，則產生書目耦合關係。當兩篇文獻的相同參考文獻數量愈多時，則耦合強度愈高，主題愈相近。(於臺大網域內點選書目耦合節點，可直接連結到期刊本文)



03 Co-authorship

作者合著分析

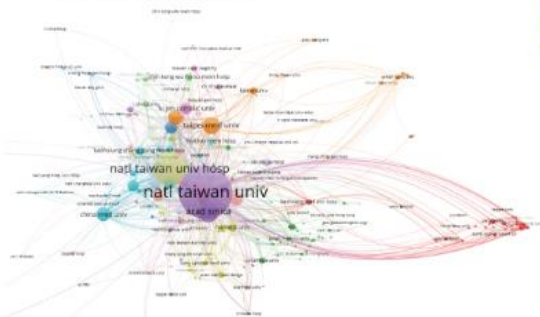
例 以non-coding RNA文獻為例



04 機構/國際合作分析

協助挖掘潛在合作團隊、了解競爭團隊研究走向！

例 流預所機構合作分布圖



05 知識源分析

發表期刊出處—可做為參考投稿方向

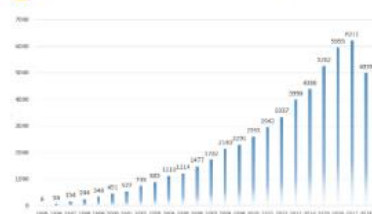
引用文獻分群狀況—找到各分群最常被引用的文獻

引用作者分群狀況—找到各分群領域的學術泰斗

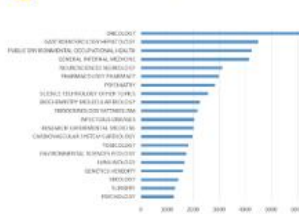
06 影響力分析

後續引用文獻的出版年份、來源期刊、機構、國家、研究領域！

例 引用流預所文獻的發表年份



例 引用流預所文獻的發表領域



07 研究前沿分析

後續高被引文獻關鍵詞分群

近2年來引用特定文獻集，且在自身領域被高度引用的文章群，可推定為該文獻集所處領域目前最新且火熱的應用方向。

前1% Highly Cited Papers + 前0.1% Hot Papers

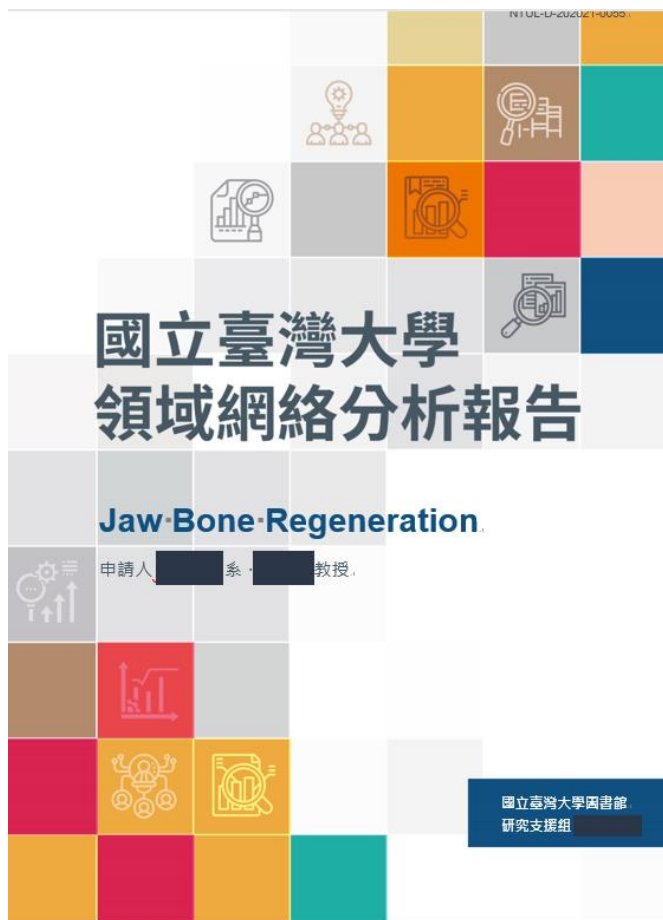
近1年高共頻作者關鍵字

排除高被引限制，聚焦近1-2年引用特定文獻集寫成之文章群之作者關鍵字分佈。可看出近1年內引用該文獻集的研究走向。

01. 研究領域 分析

實例：協助研究領域探索

醫學院牙醫系某實驗室團隊申請，目的為在現有研究計畫下，準備未來拓展研究方向或日後計畫申請標的。



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01. 研究領域分析

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醫學院某實驗室團隊申請，目的為在現有研究計畫基礎下，準備未來拓展研究方向或日後計畫申請標的。

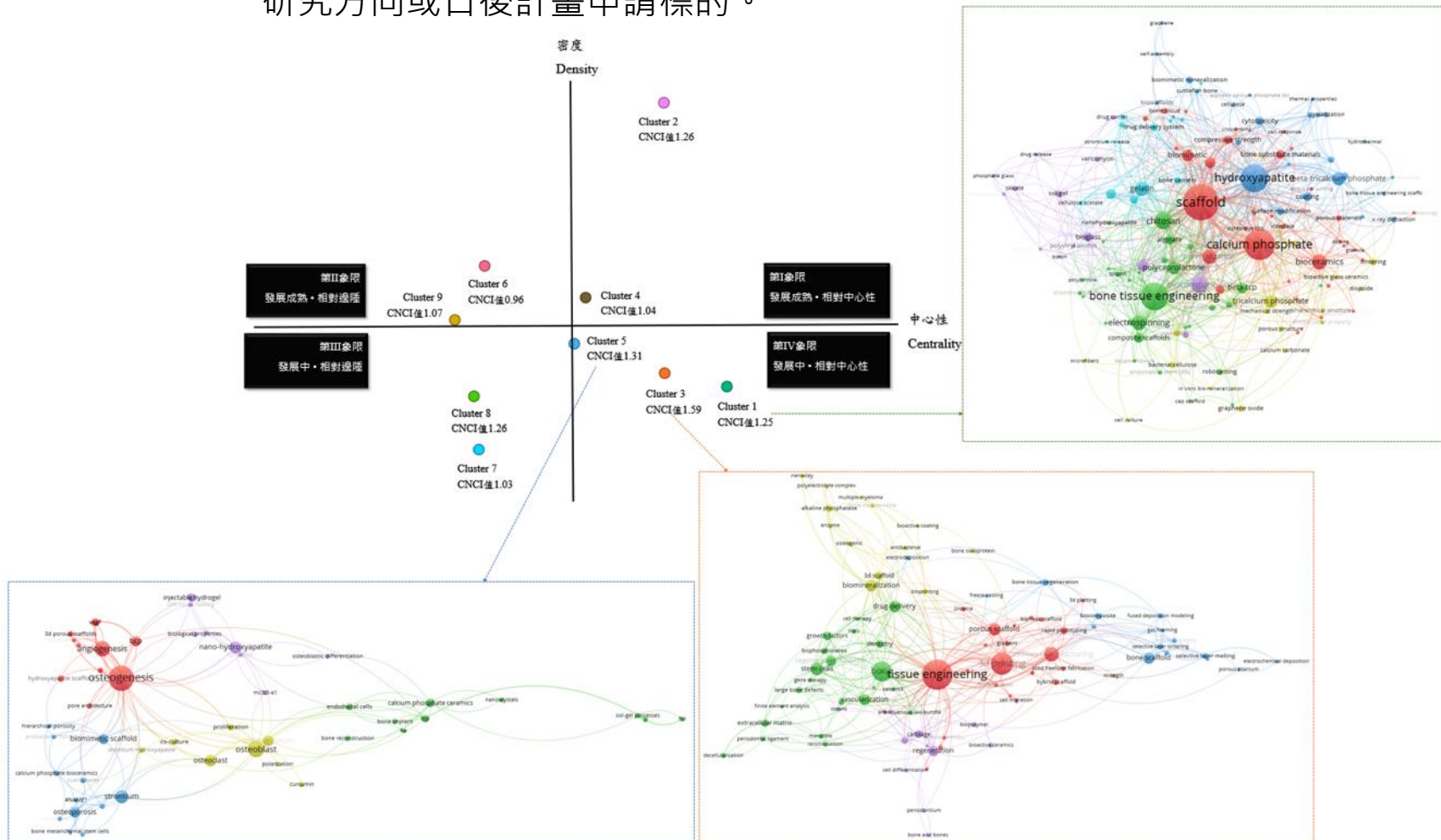


圖 12 2016-2020 年全球相關主題論文策略座標圖

01. 研究領域 分析

實例：協助教師個人研究

Kuo, T.-H., Dutkiewicz, E. P., Pei, J., & Hsu, C.-C. (2020). Ambient Ionization Mass Spectrometry Today and Tomorrow: Embracing Challenges and Opportunities. *Analytical Chemistry*, 92(3), 2353–2363.
<https://doi.org/10.1021/acs.analchem.9b05454>



analytical chemistry

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Ambient Ionization Mass Spectrometry Today and Tomorrow: Embracing Challenges and Opportunities

Ting-Hao Kuo,¹ Evelina P. Dutkiewicz,¹ Jiyng Pei,² and Cheng-Chih Hsu¹

Cite This: *Anal. Chem.* 2020, 92, 2353–2363

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ABSTRACT: Ambient ionization mass spectrometry (AIMS) has grown into a group of emerging analytical techniques that allow rapid, real-time, high-throughput, in situ, and in vivo analysis in many scientific fields including biomedicine, pharmaceuticals, and forensic sciences. While dozens of AIMS techniques have been introduced over the past two decades, their broad commercial and industrial use is still restricted by multiple challenges. In this Perspective, we discuss the most relevant technical challenges facing AIMS, i.e., reproducibility, quantitative ability, molecular coverage, sensitivity, and data complexity, and scientists' recent attempts to overcome these hurdles. Furthermore, we present future directions of AIMS from our perspective, including the necessity that efforts should be made to unravel blind biomolecules in routine analysis, the construction of a data repository for AIMS users, the full automation of pipelines for prospect integration in a robotic laboratory, the movement toward on-site tests, and the expansion of outreach to motivate government officials in policymaking. We anticipate that, with progress in these critical but immature areas, AIMS technology will keep evolving to become a more robust and user-friendly set of technologies and, consequently, be translated into everyday life practice.

Ambient ionization mass spectrometry (AIMS) is a relatively new analytical approach that involves direct sampling and ionization of analyte from their native environment.¹ AIMS allows rapid, real-time, high-throughput, in situ and in some cases in vivo analysis of liquids, solids, and gases with no need of sample preparation. This emerging technology originated with the introduction of desorption electrospray ionization (DESI)² and direct analysis in real time (DART).³ Over the last two decades, multiple AIMS techniques working under atmospheric conditions have been developed, and many of them have been widely used around the world.⁴ Recent publications related to AIMS, as displayed by network visualization⁵ in Figure 1, indicate that most of the published research work is related to DESI, DART, paper spray ionization (PSI), and AIMS-based mass spectrometry imaging. The range of applications of AIMS is exceedingly wide and covers many scientific fields including biomedicine, pharmaceutical and forensic analysis, plant science, microbiology, neuroscience, and cancer pathology, as recently reviewed in *Analytical Chemistry*.⁶ However, a few exceptional AIMS platforms have been developed for in vivo and real-time analysis, including the iKnife,⁷ SpiderMan,⁸ and MatSpex Pen.⁹ Those platforms have a great potential for intraprostatic cancer tissue diagnosis during a surgery,¹⁰ as well as pharmacokinetic analysis of human skin¹¹ or detection of food fraud.¹² The operation principles of the technique mentioned above are different, but the major idea behind the evolving development is the same: to expand the scope of AIMS and bring it outside research laboratories to introduce it into everyday practice. Due to its simplicity and capability to obtain almost immediate analytical results, AIMS technology has great potential for on-site clinical analysis¹³ (including surgery assistance and the point-of-care testing, POCT)¹⁴ or in-field environmental analysis.^{15,16}

Despite its diverse potential applications, AIMS techniques are mostly used in certain specialized laboratories, and translation of AIMS into everyday life practice has so far not been realized. Multiple challenges have slowed down the broader use of AIMS. The lack of translation of AIMS techniques into applications is a critical issue that has caught the attention of researchers and industrial users and was discussed during the 67th American Society for Mass Spectrometry (ASMS) annual conference in June 2019. In this Perspective, we systematically review the most relevant technical challenges associated with AIMS (including reproducibility, quantitative ability, molecular coverage and sensitivity, and data complexity) and scientists' recent attempts to overcome these hurdles. We especially focus on the innovative strategies developed in the recent years. Furthermore, we present ideas about how to improve performance and promote utilization of AIMS over the next decade. We describe our perspective on the today and tomorrow in AIMS in Figure 2, pointing out the technical challenges to date, along with five future directions. Specifically, we anticipate that the future of AIMS will be directed to detect biomolecules that are blind during conventional analysis, develop a data repository for

Reproducibility
Quantitative Ability
Molecular coverage
Sensitivity
Data complexity

Translation into everyday practice

Moving molecules
Publication
On-site tests
Measurement of time

Revised: December 2, 2019
Accepted: December 11, 2019
Published: December 11, 2019

ACS Publications | 2353

<https://doi.org/10.1021/acs.analchem.9b05454>
Anal. Chem. 2020, 92, 2353–2363

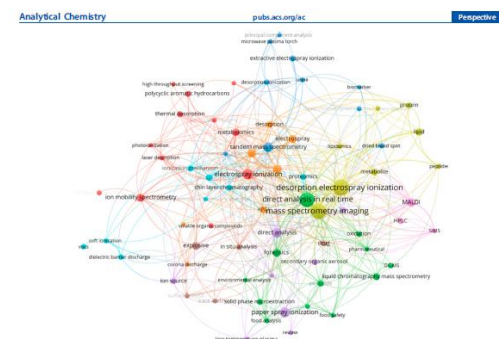


Figure 1. Network visualization of most publications related to ambient ionization mass spectrometry. The most frequently used keywords in works published from 2000 to 2019 using the search terms “ambient ionization” and “mass spectrometry” (2552 publications, retrieved September 18, 2019) were visualized by V-CiteOver. The node size varies with the frequency of usage. A minimum word frequency of 5 was required for inclusion. The top 4 highest frequency words were: desorption electrospray ionization (93), mass spectrometry imaging (87), direct analysis in real time (79), electrospray ionization (40), and paper spray ionization (34), where occurrences are noted in parentheses.

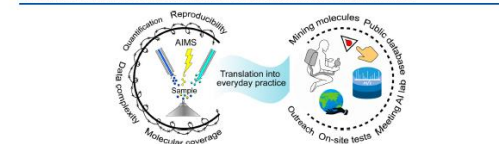


Figure 2. Ambient ionization mass spectrometry today and tomorrow. Over the past two decades, innovative strategies have emerged to overcome technical challenges (left circle), including reproducibility, quantification, molecular coverage, and data complexity. To translate AIMS into everyday practice, significant developments (right circle) to unravel blind biomolecules in routine analysis, construct a public AIMS data repository, develop a fully automatic AIMS platform for the usage in a robotic laboratory, move toward on-site tests, and expand outreach are necessary.

strategies developed in the recent years. Furthermore, we present ideas about how to improve performance and promote utilization of AIMS over the next decade. We describe our perspective on the today and tomorrow in AIMS in Figure 2, pointing out the technical challenges to date, along with five future directions. Specifically, we anticipate that the future of AIMS will be directed to detect biomolecules that are blind during conventional analysis, develop a data repository for

概述

結合書目計量與領域網絡分析於**2020年4月**首次推出學術研究力分析服務，呈現本校特定院系所或學科領域的發展現況及趨勢、學術影響力及國際合作情形等。

■ 服務目標

- 與院系所合作，提供自辦教學研究單位評鑑、學術人才招聘、學科領域發展等分析服務。
- 依校務需求不定期與行政單位合作。

■ 分析面向

- 院系所 **v.s** 學科領域不同分析視角。
- 內容包含研究領域分析、學術研究成果、標竿學校評析等。



02.
學術
研究力

實例：系所評鑑



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02. 學術研究力

實例：系所評鑑

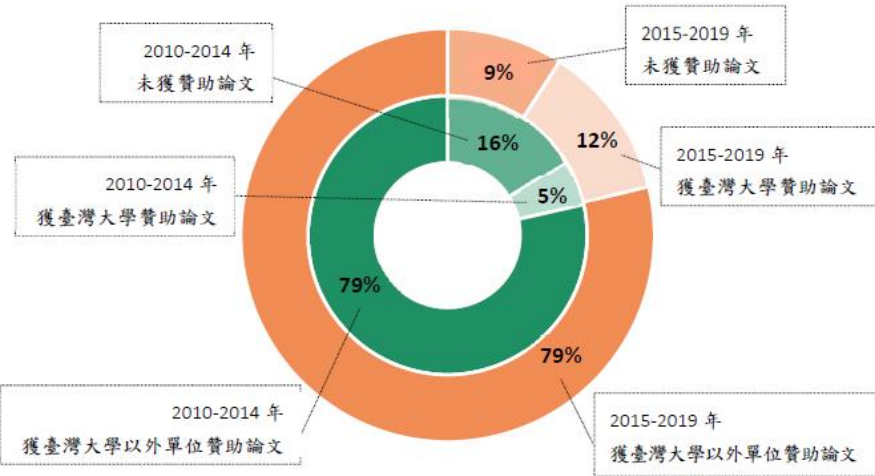


圖 3-5 2010-2014 與 2015-2019 年本校論文獲贊助情形



圖 4-8 2015-2019 年各校重點研究領域論文合作情形

實例：未來發展及人才招聘

XX研究所XX組申請，未來2-3年預計將有多位教授退休，希望能即早規畫未來發展及人才招聘的方向。



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02. 學術研究力

實例：未來發展及人才招聘

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表 3 2010-2019 年領域核心期刊發表論文數量前 20 位著者資料

# of Records	Person	Top Address (Organization)	Top Topics (Micro Citation Topics)	% of Records in Last-3 Years
153	Damste, Jaap S Sinninghe	NIOZ Royal Netherlands Inst Sea Res [111]	3.83.167 Type Strain [71]; 8.140.513 Kerogen [25]; 8.93.8 Holocene [21]	29% of 153
119	Schouten, Stefan	NIOZ Royal Netherlands Inst Sea Res [86]	3.83.167 Type Strain [39]; 8.93.8 Holocene [24]; 8.140.513 Kerogen [20]	26% of 119
107	Duarte, Carlos M	King Abdullah Univ Sci & Technol [51]	3.2.1182 Seagrass [30]; 3.2.154 Phytoplankton [26]; 3.2.570 Coral Reefs [14]	54% of 107
79	Zhang, Jing	E China Normal Univ [27]	3.2.154 Phytoplankton [20]; 3.45.1049 Humic Substances [8]; 2.90.1332 Goethite [5]	41% of 79
76	Zhang, Yang	N Carolina State Univ [35]	8.124.10 Aerosols [55]; 8.8.550 Conodonts [7]; 3.60.993 PAHs [3]	37% of 76
72	Algeo, Thomas J	Univ Cincinnati [72]	8.8.550 Conodonts [42]; 8.8.752 Stromatolites [18]; 8.93.8 Holocene [4]	56% of 72
72	Hinrichs, Kai-Uwe	Univ Bremen [66]	3.83.167 Type Strain [40]; 8.312.1202 Gas Hydrate [11]; 3.83.416 Anaerobic Digestion [6]	26% of 72
70	Pancost, Richard D	Univ Bristol [70]	3.83.167 Type Strain [18]; 8.8.517 Foraminifera [16]; 8.140.513 Kerogen [14]	23% of 70
68	Achterberg, Eric P	Univ Southampton [46]	3.2.154 Phytoplankton [51]; 3.2.570 Coral Reefs [3]; 3.91.1064 Heavy Metals [2]	50% of 68

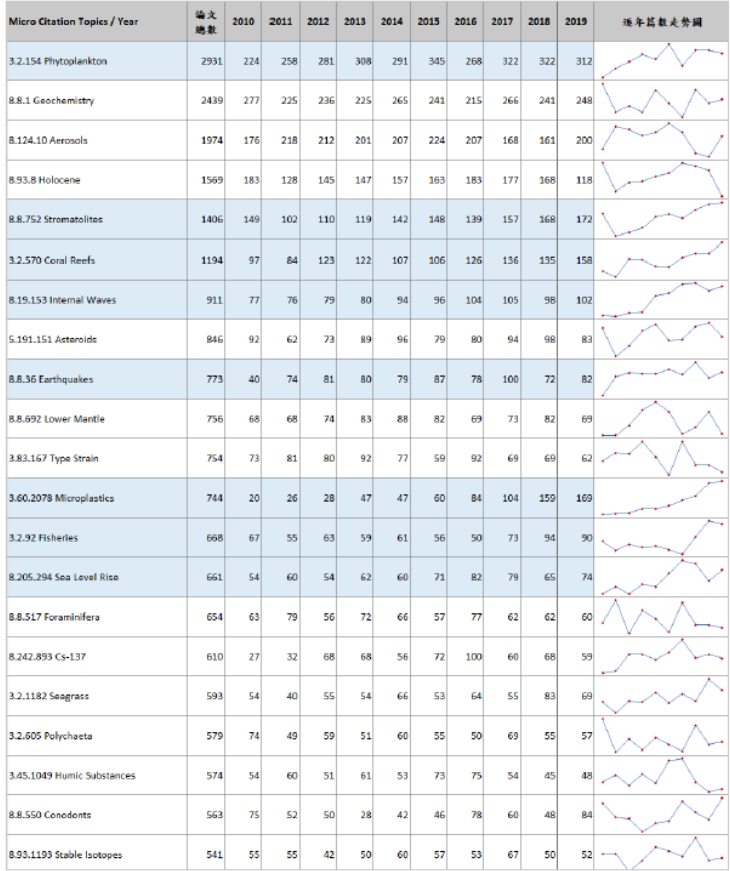


圖 9 領域核心期刊高影響力論文 500 篇以上者之篇數逐年走勢圖

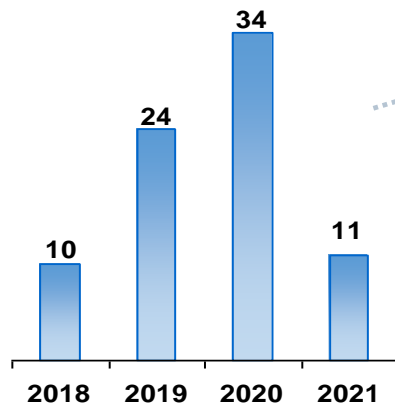
01. 研究領域分析

02. 學術研究力

服務統計

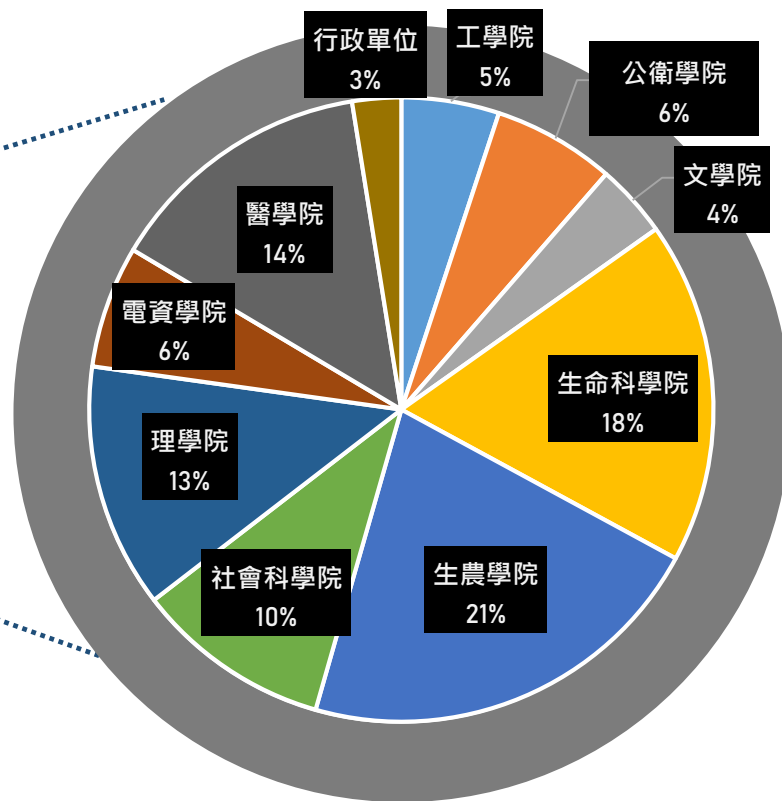
2018-2021

統計至2021年3月4日止，共計申請服務件數**79**件。



涵括不同學科領域

生命科學院及生農學學院合計佔**39%**；
醫學院及公衛學院合計佔**20%**。



03. 學術 典藏

概述

於2018年8月整合本校機構典藏及學術庫二平台功能及教師著作資料，提供單站維護和永久典藏服務。



- ▶以機構為主體，以作者為視角
- ▶展現機構人員學術研究能量

臺大學術庫
Academic Hub



臺大機構典藏
NTU Repository

- ▶以機構為主體，以文件為視角
- ▶學術成果與研究歷程保存機制

03. 學術典藏

服務平台

Statistics

- 👤 Researchers 2923
- 📖 Publications 371778
- 📁 Projects 76459
- 📄 Available Full-Text / Total 67254

NTU 國立臺灣大學圖書館 NTU SCHOLARS

中文 English

首頁 單位 研究人員 研究成果檢索 學術出版

NTU Scholars

國立臺灣大學 / 生命科學院 / 植物科學研究所

SHIH-TONG JENG

🔍 研究人員網路 📊 瀏覽統計 📧 Email 通知 📡 RSS Feed

簡歷 指標 研究成果 49 計畫 78

研究成果 (全部) 顯示/隱藏過濾條件

第 1 到 49 筆結果，共 49 筆。

公開日期	標題	作者	資料類型	scopus	WOS	全文
1 2019	The p38-like MAP kinase modulated H2O2 accumulation in wounding signaling pathways of sweet potato	Lin, H.-H.; King, Y.-C.; Li, Y.-C.; Lin, C.-C.; Chen, Y.-C.; Lin, J.-S.; Jeng, S.-T.	Journal Article	0	1	
2 2019	MicroR408 regulates defense response upon wounding in sweet potato	Kuo, Y.-W.; Lin, J.-S.; Li, Y.-C.; Jhu, M.-Y.; King, Y.-C.; Jeng, S.-T.		1	1	
3 2018	MicroRNA160 modulates plant development and heat shock protein gene expression to mediate heat tolerance in Arabidopsis	Lin, Jeng Shane; Kuo, Chia Chia; Yang, I. Chu; Tsai, Weian; Shen, Yu Hsing; Lin, Chih Ching; Liang, Yi Chen; Li, Yu Chi; Kuo, Yun Wei; King, Yu Chi; HSI-MEI LAI; SHIH-TONG JENG	journal article	12	9	
4 2017	Unraveling multifaceted contributions of small regulatory RNAs to photomorphogenic development in Arabidopsis	Lin, M.-C.; Tsai, H.-L.; Lim, S.-L.; Jeng, S.-T.; Wu, S.-H.		3	2	
5 2017	In vitro regeneration, Agrobacterium-mediated transformation, and genetic assay of chalcone synthase in the medicinal plant Echinacea pallida	Wang, H.-M.; Jeng, S.-T.; To, K.-Y.		0	0	

NTU 國立臺灣大學圖書館 NTU SCHOLARS

中文 English

首頁 單位 研究人員 研究成果檢索 學術出版

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標題: MicroRNA160 modulates plant development and heat shock protein gene expression to mediate heat tolerance in Arabidopsis

作者: Lin, Jeng Shane; Kuo, Chia Chia; Yang, I. Chu; Tsai, Weian; Shen, Yu Hsing; Lin, Chih Ching; Liang, Yi Chen; Li, Yu Chi; Kuo, Yun Wei; King, Yu Chi; HSI-MEI LAI; SHIH-TONG JENG

關鍵字: Arabidopsis | ARF10 | ARF16 | ARF17 | Heat stress | MIR160

公開日期: 1-二月-2018

出版社: FRONTIERS MEDIA SA

卷: 9

來源出版物: Frontiers in Plant Science

摘要: © 2018 Lin, Kuo, Yang, Tsai, Shen, Lin, Liang, Li, Kuo, King, Lai and Jeng. Global warming is causing a negative impact on plant growth and adversely impacts on crop yield. MicroRNAs (miRNAs) are critical in regulating the expression of genes involved in plant development as well as defense responses. The effects of miRNAs on heat-stressed Arabidopsis warrants further investigation. Heat stress in...

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Google Scholar™ 檢查

Altmetric 1

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04. 開放取用

Open Access投稿

01 教育推廣

長期深耕參考服務部落格、持續推動資訊素養教育、利用指導課程，[教育推廣資源分享](#)。

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2019.03天下雜誌掠奪型期刊報導，該年度前進本校80%系所會議宣導。

已規畫2021前進宣導OA投稿。

宣導與溝通

02

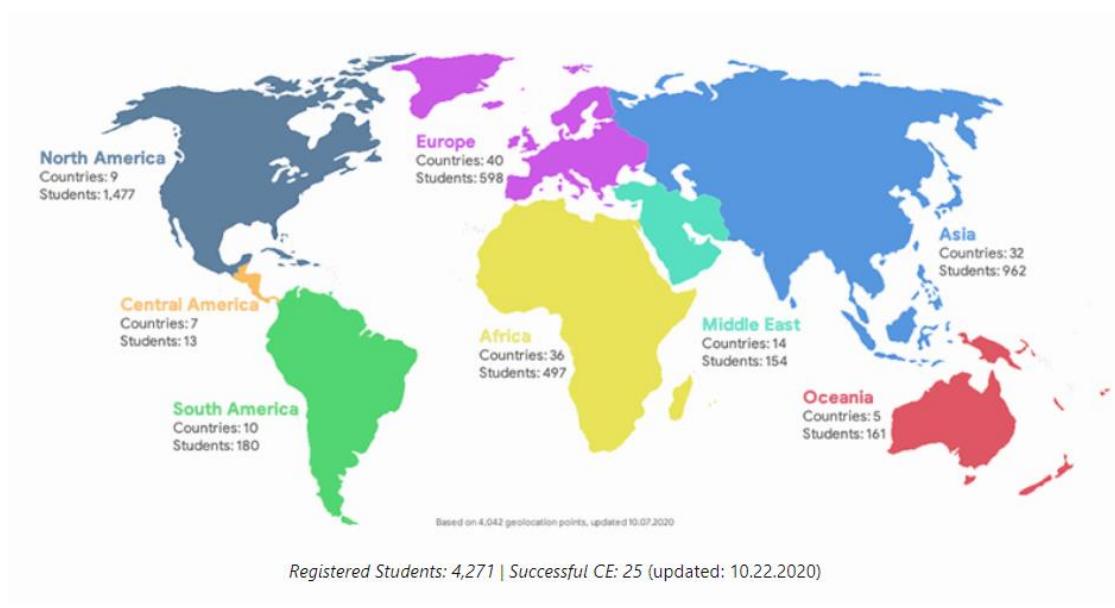
03 投稿補助方案

投稿免費-Cambridge University Press
投稿優惠-BioMed Central / Chemistry Central / SpringerOpen、[PNAS OA](#)

04. 開放取用



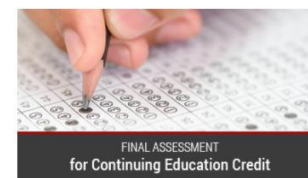
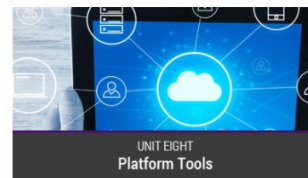
- Research Data Management Librarian Academy (RDMLA) 是由Harvard Medical School、Harvard Library、Simmons University、Boston University等多個學術機構共同合作的圖書資訊專業學術計畫。



04. 開放取用

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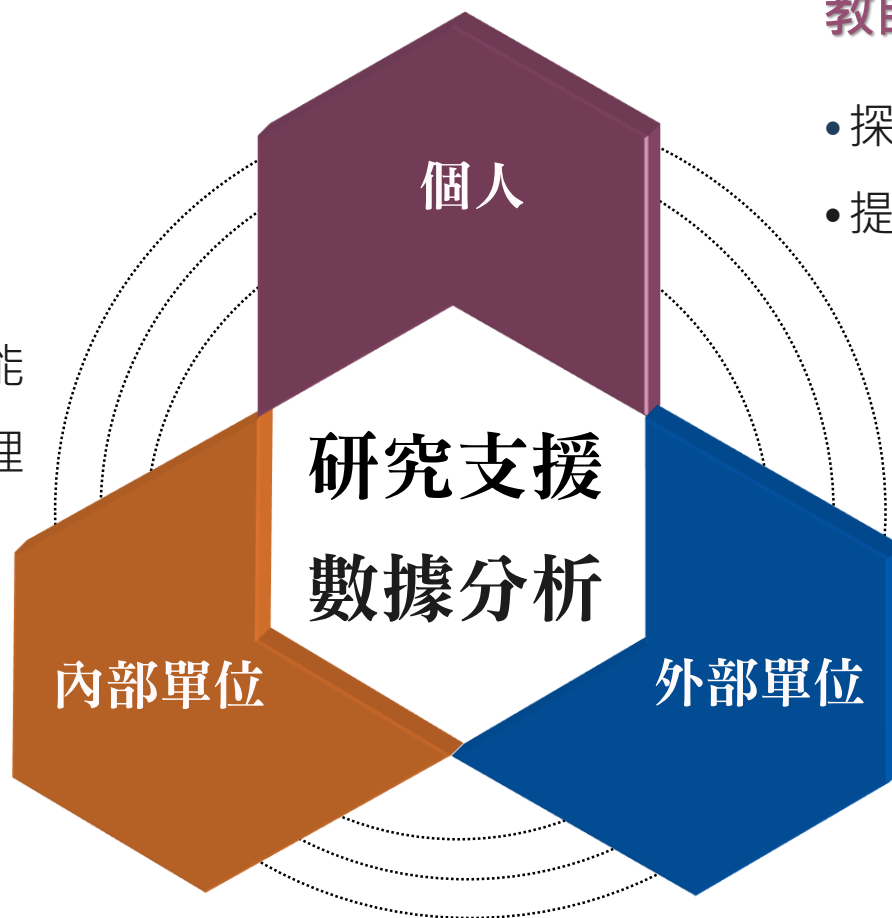
- 協助本校及華語世界的研究人員、圖書館員快速地獲得研究資料管理所需具備的知識與能力。
- 臺大圖書館於2020年6月與RDMLA簽訂合作備忘錄，進行RDMLA繁體中文課程合作計畫。第一期合作案本館預計於2021年6月完成8個課程。第二期合作目前雙方已取得共識。
- 依合作計畫時程，RDMLA預計2021年10月繁體中文課程於Canvas平台上線，依CC-BY-NC-SA授權提供公眾連結使用。



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