

## Analysis of a research institute output: Implications for academic career management

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### Abstract

Research productivity in terms of publication of research articles is a key index marker of the performance of both institutions and individuals. This study sought to understand the research output profile of the Institute of Molecular Biosciences (IMB), Mahidol University by analyzing publication output in terms of defining “in house” publications as opposed to collaborative publications, and by analyzing output in terms of academic position. A total of 228 research articles were identified from the period 2009-2013, and 50 of the 59 staff members (85%) had at least one publication. The lowest rates of publication were at the Lecturer (68.7%) and Assistant Professor (75%) levels. Surprisingly, only 110 of the publications (48.2%) had a corresponding author from the Institute, suggesting that the majority of publications arise through collaborations with other institutes. Lecturers had the lowest corresponding authorship rate (18.7%), while Associate Professors had the highest (84.1%) rate. Plotting the data individually allowed easy identification of individuals who make the largest contribution to “in house” productivity. This analysis showed that a worryingly low proportion of total output was generated in house, and that Lecturers need greater encouragement and support to act as corresponding author on their research publications.

**Keywords:** Evaluating publication, career management, IMB

### Introduction

Thailand invests a relatively small proportion of its gross national product on research and development [Taharnklaew, 2010] even in comparison to other Asian nations [Liefner and Schiller, 2008]. It is important therefore that this investment

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receives the greatest possible return, and understanding the factors associated with publication success or failure may help to direct funds to the maximum benefit. In addition, publication history of an individual is a critical component of salary and promotion exercises [Avital and Collopy, 2001]. The primary marker of research productivity is the publication of research articles, and there are numerous metrics that can be used for evaluation and benchmarking including simple paper counts, consideration of journal impact factors [Garfield, 1999] and citation analysis which indicates the relative impact of the paper in the scientific field [Garfield, 1979]. However, when assessing individual contribution within an institution the situation is somewhat more complicated in that multiple authors may be present on a single publication, and as such, the number of publications accredited to each author in an institution exceeds the total number of publications of a particular institute [Nirachanon and Smith, 2011]. In addition, articles may arise through collaborations with other institutions and as such may not reflect work undertaken “in house”. The Institute of Molecular Biosciences (IMB), Mahidol University was established in 2009 from the merger of the Institute of Science and Technology for Research and Development and the Institute of Molecular Biology and Genetics [Nirachanon and Smith, 2011]. The new institute is primarily tasked with research and post-graduate training, and consists of approximately 60 research staff of various academic levels. This study sought to analyze the publication history of the Institute of Molecular Biosciences, both with respect to overall performance as well as the contribution of the individual staff members to the total productivity.

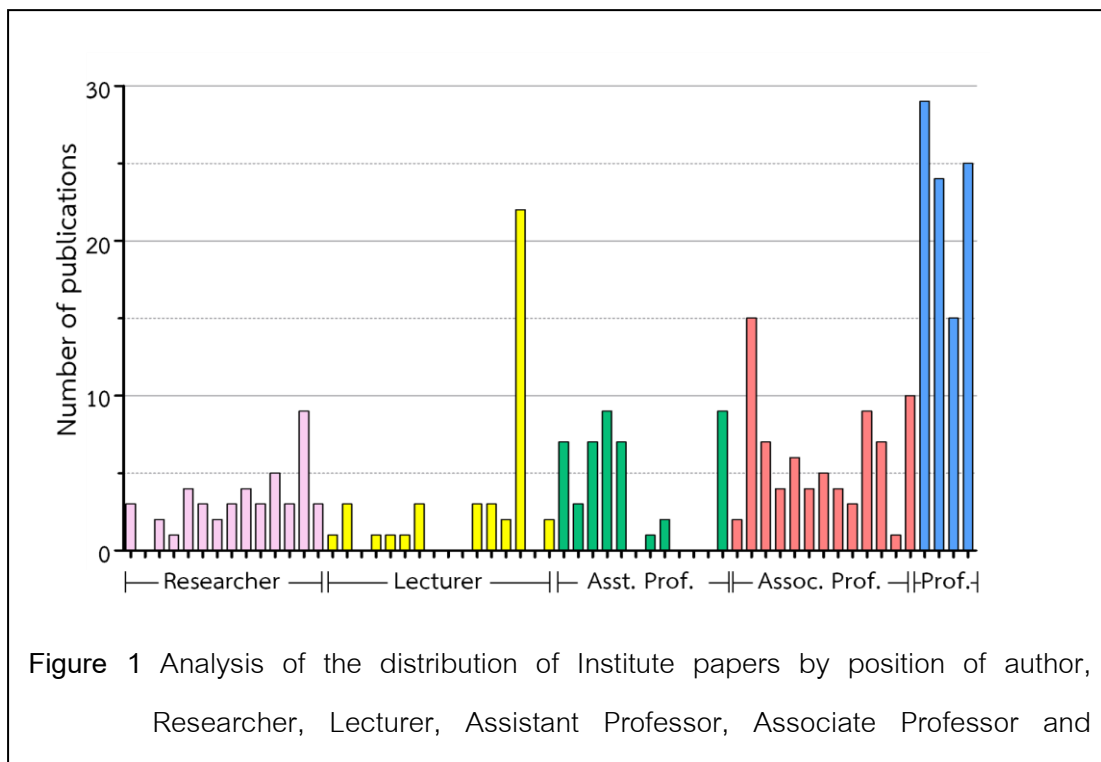
### **Materials and Methods**

The publication record of the Institute of Molecular Biosciences, Mahidol University was downloaded from the Scopus database ([www.scopus.com/home](http://www.scopus.com/home)). The search criteria were “Institute of Molecular Biosciences” AND “Mahidol” in the “affiliation name” field. A selection criterion was set for “Research Articles” only. The information was selected as “Complete format” and downloaded as a comma separated file. To

provide up to date information, data was downloaded on 9<sup>th</sup> September 2013. Information on a total of 275 papers was obtained (total Scopus output). Using the information in the column “Correspondence address” papers with a corresponding author of IMB was identified. Papers from affiliate staff members were excluded, giving a total of 228 papers which were further analyzed.

### **Results and Discussion**

Using the Scopus on line database, a total of 275 papers were identified as being research articles with at least one author as a member of the Institute or affiliated with the Institute. Research papers belonging to affiliate staff of IMB were excluded, which reduced the number of papers in the study to 228. To determine the research profile of IMB, the output of staff members was analyzed by position. A total of five positions were defined: Researcher, Lecturer, Assistant Professor, Associate Professor and Professor. The accreditation of each staff member was determined on the 228 Institute papers. This analysis gave a total of 308 authorship positions, reflecting that many papers have more than one Institute staff member on the publication. The distribution of these authorships was plotted by position as defined above. The results, Figure 1, show that unsurprisingly, the greatest numbers of publications were associated with the position of Professor, although exceptional individuals who stood out from their peers were easily identified. To further investigate, we also looked at how many people in each position had at least one authorship. Results, Table 1 showed that the lowest percentage of people with publications was Lecturers (68.7%), who showed a lower percentage than either Researchers (92.8%) or Assistant Professors (75%).



**Table 1** Authorships of staff of the Institute of Molecular Biosciences, Mahidol University 2009-2013 by academic position

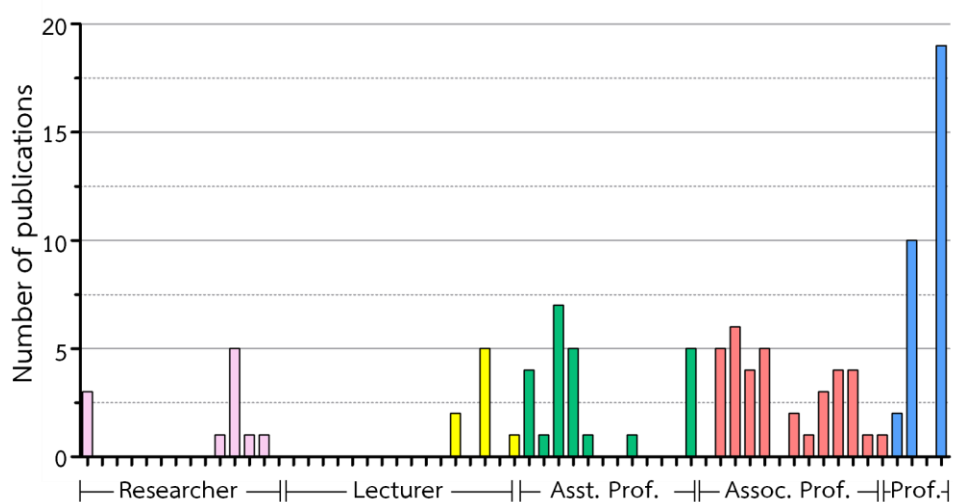
Position	Number of Staff	Number of staff with publications	%
Researcher	14	13	92.8
Lecturer	16	11	68.7
Assistant Professor	12	9	75
Associate Professor	13	13	100
Professor	4	4	100

Of the 228 papers, a total of 110 (48.2%) had a corresponding author who was a staff member of IMB (Table 2). Analysis of corresponding authorships by academic position showed an alarming distribution (Figure 2). Corresponding authors were primarily associated with Associate Professor and Professor, while only 8 out of 30

(26%) of staff in positions of Researcher or Lecturer had at least one corresponding authorship. The full breakdown of corresponding authorships by position is shown in Table 3. Of the 110 corresponding authorships, 67 (60%) were by staff at the Associate Professor or Professor rank, who only make up 28% of the total staff.

**Table 2** Publications by staff of the Institute of Molecular Biosciences, Mahidol University 2009-2013.

Year	Total Research Articles	Corresponding authorships	%
2013	47	23	48.9
2012	52	22	42.3
2011	66	34	54.5
2010	56	28	50.0
2009*	7	3	42.8
Total	228	110	48.2



**Figure 2** Analysis of the distribution of the corresponding authors of Institute papers by position of author, Researcher, Lecturer, Asst. Prof. (Assistant Professor), Assoc. Prof. (Associate Professor) and Prof. (Professor).

**Table 3** Corresponding authorship by position

Position	Number of Staff	Number of staff with corresponding authorship	%
Researcher	14	5	35.7
Lecturer	16	3	18.7
Assistant Professor	12	7	58.3
Associate Professor	13	11	84.1
Professor	4	3	75

### Conclusion

This study has shown that simple evaluation of output in terms of number of papers produced can be misleading. Somewhat less than 50% (110/228) of IMB publications can be considered “in house” by virtue of the paper having a corresponding author from the Institute. More worryingly, the study identified that the majority of these corresponding authors were by Associate Professors and Professors. Researchers and Lecturers are significantly underrepresented in corresponding authorships. Interestingly Researchers did somewhat better than Lecturers, presumably as Lecturers have additional duties. Several other studies have also reported a strong link between academic rank and productivity [Blackburn et al., 1978; Creswell, 1985; Dickson, 1983; Wanner et al., 1981], although some studies suggest there is no difference in productivity between Assistant and Associate Professors, with only a marked difference between them and the productivity of full Professors [Tien and Blackburn, 1996]. Other studies have suggested that an early rise in rank is a key productivity indicator [Prpic, 1996].

In particular, both Researchers and Lecturers need corresponding authorships for both promotion and grant applications, and as such more attention should be paid to them to discover the factors leading to poor performance in terms of corresponding

authorships. Promotion in itself has been identified as a key motivating effect on faculty research performance, and it is likely to be that promotion provides recognition of achievement that in itself drives further productivity [Allison and Stewart, 1974; Zainab, 1999]. The graphical analysis presented here clearly shows individual researchers who stand out from their peers, and management can use this information to target those individuals for encouragement for applications for promotion.

Senior management should also be aware that there may be conflict between junior and senior authors in assigning corresponding authorships to work undertaken in teams. Senior staff should be sympathetic to the career requirements of junior staff, and look carefully where corresponding authorship is assigned. Junior staff should be aware that mentoring in the publication process may help to improve both their overall publication rate, as well as in their rate of corresponding authorships.

#### **Acknowledgement**

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