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National Cancer Institute Centers and Society of Surgical Oncology Cancer Research Synergy

Bradford J. Kim, MD, MHS[a], **Subhasis Misra, MD, MS, FACCWS, FACS**[b], **Herbert Chen, MD, FACS**[c], **Teresa M. Bell, PhD**[d], **Leonidas G. Koniaris, MD, MBA, FACS**[a], and **Nakul P. Valsangkar, MD**[a,*]

[a]Department of Surgery, Indiana University School of Medicine, Indianapolis, Indiana

[b]Department of Surgical Oncology, Texas Tech University Health Sciences Center, Amarillo, Texas

[c]Department of Surgery, University of Alabama at Birmingham, Birmingham, Alabama

[d]Center for Outcomes Research, Department of Surgery, Indiana University School of Medicine, Indianapolis, Indiana

Abstract

Background: The objective of this study was to examine the influence of Surgical Society Oncology (SSO) membership and National Cancer Institute (NCI) status on the academic output of surgical faculty.

Methods: NCI cancer program status for each department of surgery was identified with publically available data, whereas SSO membership was determined for every faculty member. Academic output measures such as NIH funding, publications, and citations were analyzed in subsets by the type of cancer center (NCI comprehensive cancer center [CCC]; NCI cancer center [NCICC]; and non-NCI center) and SSO membership status.

Results: Of the surgical faculty, 2537 surgeons (61.9%) were from CCC, whereas 854 (20.8%) were from NCICC. At the CCC, 22.7% of surgeons had a history of or current NIH funding, compared with 15.8% at the NCICC and 11.8% at the non-NCI centers. The academic output of SSO members was higher at NCICC (52 ± 113 publications/1266 ± 3830 citations) and CCC (53 ± 92/1295 ± 4001) compared with nonmembers (NCICC: 26 ± 78/437 ± 2109; CCC: 37 ± 91/670 ± 3260), respectively, $P < 0.05$. Multivariate logistic regression revealed that SSO membership imparts an additional 22 publications and 270 citations, whereas NCI-designated CCC added 10 additional publications, but not citations.

Conclusions: CCCs have significantly higher academic output and NIH funding. Recruitment of SSO members, a focus on higher performing divisions, and NIH funding are factors that non-NCI cancer centers may be able to focus on to improve academic productivity to aid in obtaining NCI designation.

[*]*Corresponding author*. Department of Cardiothoracic Surgery, Emory University, 1365 Clifton Road, Atlanta, GA 30322. Tel.: (404) 778-5000; fax: 1 6179490211. nakul.valsangkar@gmail.com (N.P. Valsangkar).

Disclosure

The authors reported no proprietary or commercial interest in any product mentioned or concept discussed in this article.

Keywords

Academic; Career; Surgical education; Surgeon

Introduction

The National Cancer Institute (NCI) cancer centers program was established in 1971 by the National Institutes of Health (NIH) to create regional cancer centers of excellence for both patient care and research.[1] Among these, the NCI-designated comprehensive cancer centers are selected based on excellence in three areas: research, cancer prevention and clinical care; while programs that do not meet all three criteria but nonetheless outstanding are designated either NCI research centers or NCI cancer centers. The Society of Surgical Oncology (SSO) was established to foster close interactions between surgeons, medical oncologists, radiologists, and basic scientists to improve outcomes for cancer patients through interdisciplinary clinical care, research, education, and advocacy.[2]

Although both NCI cancer center status and SSO membership have a focus on research, the actual impact of these entities on academic productivity of surgeons remains undefined. The measurement of publications, citations, and H-index as academic output, is a well-validated tool to identify success in academic medicine and other scientific research-focused disciplines.[3–10] These objective measures of academic output and extramural research funding, such as from the National Institutes of Health (NIH), are used across disciplines and institutions to identify individuals for promotions, tenure, as well as entry into academically distinguished societies and organizations. Such rankings have increasingly been utilized to determine institutional rankings.[11]

Surgical oncologists have been identified as a highly academic productive group.[8] To date, the relationship of SSO membership and NCI status has not been defined. This study hypothesized that surgeons who were either members of the SSO or worked at NCI cancer centers would demonstrate improved academic productivity. Therefore, this study sought to compare the demographics, departmental structure, organization, and academic output of faculty members in surgical oncology, general surgery, and other surgical subspecialties at NCI-designated comprehensive cancer centers, with faculty members at NCI cancer centers and non-NCI centers. In addition, this study examined the influence of SSO membership with NCI status on the academic output of surgical faculty at these centers.

Methods

Study population

Academic metrics of research output were collected for 4015 faculty members at the top 50-ranked-universitybased and the top five-ranked-hospitalebased departments of surgery by NIH funding. Using previously described methods, the list of university- and hospital-based departments of surgery and data regarding academic metrics were collected.[8] Departmental websites for the 55 departments of surgery were reviewed and a list of 4015 surgical faculty members were identified. For these faculty members, demographic variables including

academic degrees, academic rank, career track (clinical or research), specialty, and division, were collected.[8] The NCI cancer program status for each of the departments of surgery was identified with publically available data (https://report.nih.gov/, http://www.grantome.org date accessed: 11/30/2016). SSO membership status was determined for every faculty member by cross-referencing the SSO membership lists. The data was analyzed in subsets by the type of NCI cancer center (NCI-designated comprehensive cancer center [CCC]; NCI-designated cancer center [NCICC]; and non-NCI center) and whether or not the faculty member was a member of the SSO (SSO *versus* non-SSO).

Academic metrics and NIH funding

Academic metrics were collected for each faculty member from the SCOPUS online database, which was accessed at http://scopus.com.proxy.medlib.iupui.edu. NIH funding details (including type: R01, U01, F32 etc; funding agency, and number of each grant) were collected for the surgical faculty from online data sets which included the NIH online data repository of funding, NIH RePORT and the Grantome© online database (www.grantome.com). NIH funding was grouped into the following three categories: (1) no current/former NIH funding, (2) NIH R01/U01/P01 funding, and (3) NIH smaller grants (F32, R03, T32, R23.) funding.

Statistical analysis

Categorical variables included academic rank, divisions, credentials, gender, type of NIH funding, and presence of current NIH funding. The continuous variables included total numbers of publications, total career citations, 3-y citations, and H-indices. The departments of surgery were then grouped into quintile rank bins based on total NIH funding awarded to the department (1–10, 11–20, 21–30, 31–40, and 41–50). The five hospital-based divisions were excluded from the rank bins. Group comparisons for continuous variables were made using *t*-test of means for two groups and ANOVA for multiple groups. Categorical variables were compared using the χ^2 test. A $P < 0.05$ was considered statistically significant.

Ethics statement

Only publically available data sets were queried for examination. This study was reviewed by the Institutional Review Board of Indiana University School of Medicine and determined to fall under “exempt” status. (http://www.hhs.gov/ohrp/policy/checklists/decisioncharts.html).

Results

Demographics

Currently, there are 29 designated CCC, 12 NCICC, and 13 non-NCI centers among the institutions included in this study (Table 1). Of the surgical faculty, 2537 faculty members (61.9%) were from CCC, whereas 854 (20.8%) were from NCICC (Tables 1 and 2). There was no difference in the academic rank structure between CCC, NCICC, and non-NCI centers. At CCC, 34.6% were assistant professors, 27% were associate professors, and 38.4% were full professors, and this distribution of academic ranks was similar at NCICC and non-NCI centers.

CCCs were more likely to have surgical faculty in leadership positions (13.7%) compared with NCICC (7.9%) and non-NCI centers (10%), $P < 0.05$. There were no differences in female faculty prevalence between these types of center (20.6%−22.2%). Although CCC had a trend for more surgical faculty with PhDs or MD-PhDs (12%) *versus* those at NCICC (6.5%) and non-NCI centers (9.9%), this did not attain statistical significance.

At CCC, 22.7% of surgical faculty had a history of or current NIH funding, compared with 15.8% at the NCICC and 11.8% at the non-NCI centers. Although this increased funding was driven by smaller NIH grants, CCC surgical faculties were better funded by NIH R01/P01/U01 grants (9.5%) compared with those from NCICC (7.9%) and non-NCI centers (6.8%). CCC (11%) and non-NCI (8.5%) faculty were more likely to have SSO membership than at NCICC (4.6%), $P < 0.05$.

NCI-designated comprehensive cancer centers demonstrate research excellence at every academic level

The median publications and citations (±standard deviation [SD]) for aggregate faculty at CCC were 43 ± 101 and 754 ± 3396 compared with NCICC (28 ± 80, 445 ± 2577) and non-NCI (27 ± 78, 400 ± 2532), $P < 0.05$ (Table 2). This difference in academic productivity extended to each academic professor rank (Table 2).

Faculty in leadership positions had higher academic metrics than those at corresponding leadership positions at the NCICCs and non-NCI centers. The publications/citations (P/C ± SD) for division chiefs/chairman at CCCs were 83 ± 122/2003 ± 3992

compared with 69 ± 86/1242 ± 3063 for faculty at NCICCs and 71 ± 68/1213 ± 4111 at non-NCI centers, $P < 0.05$. With regard to the same metrics (P/C ± SD), CCC female faculty members had better academic output (24 ± 77/425 ± 2478) than those at NCICCs (15 ± 38/256 ± 1938) and non-NCI centers (15 ± 32/293 ± 1451). The greatest increase in academic productivity was seen for CCC MD-PhDs (66 ± 134/1409 ± 4374) compared with non-NCI center MD-PhDs (34 ± 49/788 ± 2712), $P < 0.05$.

Although there were differences in the percent of faculty that were funded by the NIH (as previously seen in Table 1), there were no differences in the academic productivity between faculty members with equivalent NIH grants at different NCI center types (Table 2). The most cited faculty members at each of these centers demonstrated that academic output was highest at the CCC (198 ± 176/6153 ± 6102) as compared with the NCICC (131 ± 141/3834 ± 4612) and non-NCI–designated centers (109 ± 143/3150 ± 5049).

SSO members have significantly higher academic output

In this data set, 359 (20.9%) members of the SSO were identified. The academic output of SSO members (51 ± 95/1108 ± 3867) was significantly higher than nonmembers (34 ± 84/589 ± 2867), $P < 0.01$ (Table 3). SSO members were also more likely to be full professors (43.4% *versus* 34.7%). At every academic level, SSO members had higher academic output. There was no distinction between SSO members and non-members with regard to divisional leadership positions. However, divisional leaders/Chairman who were SSO members had higher academic output.

There was a greater representation of female faculty among SSO members compared with nonmembers (29.3% *versus* 20.7%, $P < 0.05$). Higher academic output was observed regardless of the surgical faculty member's gender.

Higher numbers of MD-PhDs were seen among SSO members but academic productivity was similar to non-SSO MD-PhDs. There was only one PhD that was an SSO member (Table 3).

SSO members were equally likely to obtain R01 funding, however, were far more likely to obtain smaller, non-RO1 grants from the NIH (15.2% *versus* 8.7%, $P < 0.05$). Among faculty with R01 grants, there were no differences among the numbers of publications for SSO members *versus* non-members concerning numbers of publications, but SSO members had nearly two times as many citations (4317 *versus* 2551). SSO members with non-R01 grants had greater academic productivity than nonmembers for both publications (81 ± 122 *versus* 58 ± 88) and citations (2006 ± 5807 *versus* 1311 ± 2871), $P < 0.05$. The most cited faculty among both SSO members and nonmembers had similar levels of academic productivity (Table 3).

NCI cancer designation and membership of the SSO act synergistically

Incremental academic output was seen from NCICC to CCC. A further increase in academic productivity was observed for SSO members at each of these NCI cancer center types (Table 4). The academic output of SSO members was higher at NCICC (52 ± 113/1266 ± 3830) and CCC (53 ± 92/1295 ± 4001) compared with nonmembers (NCICC: 26 ± 78/437 ± 2109; CCC: 37 ± 91/670 ± 3260), respectively, $P < 0.05$. When academic output was analyzed by subspecialty, the impact of academic output was because of CCC, and SSO membership was predominantly observed in the specialty of surgical oncology (Table 4).

Multivariate models for academic output

Multivariate logistic regression revealed that SSO membership imparts 22 additional publications and 270 additional citations when adjusted for other factors that influence academic productivity (Table 5). Other factors that correlated with increased academic productivity included any NIH funding (57 additional publications, 420 citations), specifically NIH R01 funding (70 additional publications, 314 citations), and faculty working in a high-performance division (surgical oncology, transplant, cardiothoracic surgery; nine additional publications). When adjusted for the aforementioned factors, the practice at an NCI-designated comprehensive cancer center added 10 additional publications, but not citations.

Discussion

There are 69 NCICCs in the United States and these play a dominant role in the NCI's cancer control efforts.[1,12,13] Although most of these NCI centers are located within large academic universities, some are free-standing institutions. These centers are designed to have scientific leadership and the necessary infrastructure for cross-disciplinary collaborations to aid in accomplishing research.[1] Currently, there has been no objective measure of academic output of these institutions or comparison between types of cancer

institutions. Although touted as institutions responsible for significant improvement in patient survival from cancer, the magnitude of academic impact from these institutions have never been measured. This study demonstrates that the research efforts of the CCC, as well as the NCICC have a strong academic impact. They also tend to have a greater number of surgical faculty members in leadership positions. This stronger and more structured emphasis on research resulted in two times as many NIH grants as non-NCI centers. Faculty members at the CCC had significantly higher academic outputs than the NCICCs and the non-NCI centers. In particular, women faculty members, and those with an MD-PhD demonstrated far higher academic output. Statistical outliers also attained a much higher level of publications and citations at the CCC.

The role and importance of efforts to recruit, train, and promote women faculty members has been extensively discussed.[14] Identifying the contributions of women and promoting them is associated with better overall NIH funding and better-cited publications.[15–18] The CCC appears to be an environment that promotes academic productivity among women faculty. The focus on research excellence at CCC appears to attract high impact academics as evidenced by the significantly higher publications and citations among the 10-most cited faculty at each of the grouped institutions.

The SSO was founded as the James Ewing Society in 1940; its mission is to advance the field of surgical oncology through research, training, and education with a self-identified commitment to the advancement of knowledge and discovery to foster better cancer care. This study shows that SSO members have significantly higher academic output than nonmembers. The SSO membership and the faculty members at CCCs have several overlapping characteristics that associate with better academic productivity. A higher proportion of female surgical faculty members and a greater proportion of MD-PhDs were seen among SSO members. Organizations such as the Society of University Surgeons and Association for Academic Surgery have been associated with promoting the academic career development of junior and senior faculty[19–21]; however, this is the first time that a specialty-specific organization membership has been associated with higher academic productivity.

The funding obtained by SSO members among non-RO1 grants is far more than non-SSO faculty, and the faculty that obtained this funding performed better. The higher academic output at the CCC was explained by the type of funding obtained, faculty members from certain higher performing divisions (surgical oncology, transplant, cardiothoracic surgery) and also independently predicted by SSO membership. The results highlight the factors that distinguish research productivity of these institutions from other non-NCI–designated centers. The caveat of this article is that it does not address clinical productivity.

The data in this article identify that SSO membership is associated with factors independent of NIH funding and faculty members from higher productive divisions. Joining the SSO at an earlier career stage may represent an effective career strategy for recent graduates of surgical oncology programs. The factors obtained through the used multivariate model may represent a list of targetable goals for non-NCI cancer centers that wish to become an NCICC.

Limitations

These data are unable to distinguish between causation and association. Although the SSO members were associated with significantly high academic productivity metrics, it is possible that those surgical faculties with the highest publication records were drawn to the SSO and then were accepted into their ranks. Although being a member of the SSO does identify a highly productive academic surgical faculty member, it does not speak to the temporal association of SSO membership and increased academic productivity. This will likely need to be the subject of a future study based on the same data set of faculty as a two-point analysis.

Conclusion

This study suggests that CCC have significantly higher academic output and NIH funding, and this may be associated with a research environment in which MD-PhDs, women, and faculties from all academic levels thrive, and not just a select few higher ranked faculty members. The SSO appears to be associated with a mission of promoting education and discovery. Recruitment of SSO members, a focus on higher performing divisions, and R01 funding are factors that non-NCI cancer centers may be able to focus on to expand their role in the advancement of cancer research through better NCI designation.

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Table 1 –

Analysis of composition and academic profile of departments of surgery by the NCI cancer status of the concerned institution.

Parameter	NCI comprehensive cancer centers	NCI cancer centers	Non-NCI—designated centers	*P* value NCI-CCC and NCICC *versus* non-NCI centers
	***n*, Percentage**	***n*, Percentage**	***n*, Percentage**	
Institutional *n*, faculty *n*, %	29, 2537, 61.9%	12, 854, 20.8%	13, 710, 17.3%	-
Academic ranks				
Assistant professor	34.6%	37.3%	40.4%	N.S
Associate professor	27.0%	28.6%	25.0%	N.S
Professor	38.4%	34.1%	34.6%	N.S
Divisional leadership positions				
Division chief	13.7%	7.9%	10.0%	<0.05
Gender				
Female	22.2%	20.2%	20.6%	N.S
Degrees				
PhD or MD-PhD	12%	6.5%	9.9%	N.S
NIH funding				
R01/P01/U01	9.5%	7.9%	6.8%	<0.01
Non-R01	13.2%	7.9%	5.0%	<0.01
No current/former NIH funding	77.3%	84.1%	88.3%	<0.01
SSO membership				
SSO member	279, 11.0%	36, 4.6%	60, 8.5%	<0.05

Table 2 –

Analysis of metrics of scholarly productivity of departments of surgery by the NCI cancer status of the concerned institution.

Parameter	NCI comprehensive cancer centers*		NCI cancer centers		Non-NCI—designated centers	
	Publications, median ± SD	Citations, median ± SD	Publications, median ± SD	Citations, median ± SD	Publications, median ± SD	Citations, median ± SD
Overall	43 ± 101 (1–1938)	754 ± 3396 (1–55,118)	28 ± 80 (1–747)	445 ± 2577 (1–22,559)	27 ± 78 (1–1002)	400 ± 2532 (2–26,158)
Academic ranks						
Assistant professor*	18 ± 50	245 ± 1188	12 ± 23	141 ± 789	11 ± 16	129 ± 427
Associate professor	46 ± 44	807 ± 1706	33 ± 40	517 ± 1003	27 ± 31	356 ± 2335
Professor	110 ± 131	2693 ± 4598	82 ± 116	1832 ± 3826	74 ± 112	1414 ± 3507
Divisional leadership positions						
Division chief	83 ± 122	2003 ± 3992	69 ± 86	1242 ± 3063	71 ± 68	1213 ± 4111
No position	38 ± 96	664 ± 3255	27 ± 80	433 ± 2456	26 ± 27	395 ± 2374
Gender						
Female	24 ± 77	425 ± 2478	15 ± 38	256 ± 1938	15 ± 32	293 ± 1451
Male	49 ± 106	873 ± 3578	33 ± 88	589 ± 2711	30 ± 38	464 ± 2729
Degrees						
MD	40 ± 95	667 ± 3304	26 ± 76	386 ± 2033	24 ± 80	352 ± 2553
PhD	50 ± 92	1575 ± 2640	31 ± 130	955 ± 3044	43 ± 58	1421 ± 1836
MD-PhD	66 ± 134	1409 ± 4374	49 ± 62	1227 ± 1354	34 ± 49	788 ± 2712
NIH funding						
R01/P01/U01	110 ± 173	3214 ± 5331	113 ± 142	3616 ± 4837	99 ± 701	2507 ± 2012
Non-R01	62 ± 97	1518 ± 3714	57 ± 104	1246 ± 3386	60 ± 167	1090 ± 5015
No current/former NIH funding	32 ± 70	467 ± 2382	23 ± 62	342 ± 1552	22 ± 61	330 ± 2120
Most cited faculty members	198 ± 176	6153 ± 6102	131 ± 141	3834 ± 4612	109 ± 143	3150 ± 5049

*For every comparison between (NCI comprehensive cancer centers [CCC]) and (NCI cancer centers [NCICC] and non-NCI centers), $P < 0.05$.

Table 3 –

Subset analysis of scholarly output by membership of the SSO.

Parameter	SSO member				SSO nonmember			
	*n**	(%)	Publications, median ± SD	Citations, median ± SD	*n*	(%)	Publications, median ± SD	Citations, median ± SD
n of institutions, faculty members, % faculty	359	20.9%	51 ± 95	1108 ± 3867	1356	79.1%	34 ± 84	589 ± 2867
Academic ranks								
Assistant professor	89	26.6%	18 ± 22	279 ± 730	482	38.6%	16 ± 35	214 ± 1046
Associate professor	100	29.9%	46 ± 40	953 ± 1342	334	26.7%	40 ± 45	727 ± 1636
Professor	145	43.4%	118 ± 113	3452 ± 5064	431	34.7%	89 ± 102	2113 ± 3923
Divisional leadership positions								
Division chief	46	13.2%	114 ± 98	2748 ± 4100	164	12%	79 ± 109	1775 ± 3922
No position	300	86.8%	48 ± 91	985 ± 3868	1192	88%	31 ± 77	538 ± 2717
Gender								
Male	250	70.6%	64 ± 99	1561 ± 4272	1075	89.3%	38 ± 86	685 ± 3037
Female	104	29.3%	33 ± 59	483 ± 2216	281	20.7%	19 ± 63	356 ± 2146
Degrees								
MD	302	92%	48 ± 87	1096 ± 3850	1060	88.4%	31 ± 79	536 ± 2703
PhD	1	0.3%	-	-	76	6.3%	35 ± 92	1189 ± 2294
MD-PhD	25	7.7%	59 ± 106	1370 ± 3435	62	5.3%	57 ± 128	977 ± 4492
NIH funding								
R01/P01/U01	39	11.6%	112 ± 84	4317 ± 3283	149	11.6%	99 ± 138	2551 ± 4905
Non-R01	51	15.2%	81 ± 122	2006 ± 5807	112	8.7%	58 ± 88	1311 ± 2871
No current/former NIH funding	245	73.1%	40 ± 88	678 ± 3169	1018	79.7%	24 ± 63	415 ± 2107
Most cited faculty members	79	-	155 ± 120	5306 ± 5459	157	-	158 ± 142	4120 ± 4120

Non-surgical oncology divisions such as trauma, ACS, critical care, vascular surgery, and transplant surgery have been excluded from this subset analysis.

*Of the SSO members, data regarding academic rank, degrees was not available for a small number and those were not counted in the *n*.

Table 4 –

Subset analysis of academic output by type of NCI designation and membership of the Society for Surgical Oncology, SSO.

Parameter	NCI comprehensive cancer centers		NCI cancer centers		Non-NCI-designated centers	
	SSO member[†]	SSO nonmember	SSO member	SSO nonmember	SSO member	SSO nonmember
Overall, *n* (% in NCI category)	255 (23.6%)	823 (76.4%)	35 (11.7%)	263 (88.3%)	57 (20%)	227 (80%)
Overall, academic productivity	53 ± 92	37 ± 91	52 ± 113	26 ± 78	33 ± 98	30 ± 56
(publications ± SD,	1295 ± 4001	670 ± 3260	1266 ± 3830	437 ± 2109	504 ± 3126	426 ± 1721
citations ± SD)						
N of institutions	29		12		13	
Surgical oncology						
n, %	169 (73.4%)	61 (26.6%)	13 (38.2%)	21 (61.8%)	46 (56.7%)	35 (43.3%)
(Publications ± SD,	56 ± 95	24 ± 84	39 ± 42	30 ± 51	31 ± 102	26 ± 41
citations ± SD)	1330 ± 4507	543 ± 3735	1620 ± 3554	453 ± 1577	390 ± 3316	400 ± 1563
General surgery, and minimally invasive surgery						
n, %	66 (14.1%)	399 (85.9%)	17 (10.1%)	150 (89.9%)	11 (10.7%)	91 (89.3%)
(Publications ± SD,	46 ± 88	36 ± 93	57 ± 84	22 ± 78	51 ± 83	20 ± 60
citations ± SD)	1213 ± 2534	645 ± 3455	1266 ± 2775	360 ± 2434	976 ± 2279	326 ± 2287
All other surgical specialties[*]						
n, %	14 (3.8%)	351 (96.2%)	3 (3.3%)	87 (96.7%)	0 (0%)	101 (100%)
(Publications ± SD,	69 ± 77	38 ± 89	20 ± 301	31 ± 83	N/A	38 ± 56
citations ± SD)	936 ± 1676	695 ± 2939	438 ± 6170	613 ± 1594		748 ± 1067

[*] Including pediatric surgery, plastic surgery, surgical research transplant, vascular surgery.

[†] SSO membership status was compared for specialties where applicable. Those subspecialties where this was not applicable (acute care surgery, trauma surgery, and critical care) were excluded from analysis.

Table 5 –

Multivariate linear regression identifying the factors that predict academic success as measured by publications and citations.

Predictive factors	Unstandardized coefficients β (number of publications/citations added per dependant variable unit)	*P* value
Publications		
Membership of the Society of Surgical Oncology	22.31	<0.001
NIH funding		
NIH R01/P01/U01 funding *versus* No funding	70.56	<0.001
Any NIH funding *versus* No funding	57.68	<0.001
Faculty at NCI-designated centers		
Faculty member at NCI comprehensive cancer center *versus* non-NCI center	10.3	0.05
Faculty member at NCI cancer center *versus* non-NCI center	-	N.S.
Faculty member in a higher performing division (surgical oncology, transplant, cardiothoracic surgery)	9.47	0.039
Faculty member has a PhD (MD-PhD or PhD)	-	N.S
Faculty member at top-10 NIH-funded department of surgery	-	N.S.
Citations		
Publications	30.45	<0.001
Membership of the Society of Surgical Oncology	270.65	0.016
NIH funding		
NIH R01/P01/U01 funding *versus* No funding	314.16	0.019
Any NIH funding *versus* No funding	420.59	<0.001
Faculty at NCI-designated centers		
Faculty member at NCI comprehensive cancer center *versus* non-NCI center	-	N.S
Faculty member at NCI cancer center *versus* non-NCI center	-	N.S
Faculty member in a higher performing division (surgical oncology, transplant, cardiothoracic surgery)	-	N.S
Faculty member has a PhD (MD-PhD or PhD)	-	N.S
Faculty member at top-10 NIH-funded department of surgery	-	N.S