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Authors

Kim, Yong-Hun

Kim, Lucas

Vidal, Nahid Y

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Innovation in dermatology: where are the dermatologists? A retrospective review of the Pitchbook Database

Yong-Hun Kim¹, Lucas Kim², Nahid Y Vidal³

Affiliations: ¹Alix School of Medicine, Mayo Clinic, Rochester, Minnesota, USA, ²Department of Comparative Medicine, Yale University, New Haven, Connecticut, USA, ³Department of Dermatology, Mayo Clinic, Rochester, Minnesota, USA

Corresponding Author: Nahid Y Vidal, 200 First Street SW, Rochester, MN 55905, Tel: 507-266-7890, Email: Vidal.Nahid@mayo.edu

Abstract

To investigate the extent to which dermatologists are involved in innovative dermatology start-up companies, we analyzed the Pitchbook database which covers private capital markets. From January 1, 2010 to June 23, 2021, there were 105 dermatology companies, of which six (5.7%) had a dermatologist chief executive officer (CEO), 16 (15.2%) had a dermatologist founder, and 19 (18.1%) had a dermatologist advisor or board member. There were 98 dermatologists with leadership positions, including six (6.1%) CEOs, 21 (21.4%) founders, 11 (11.2%) chief medical officers (CMOs), and 60 (61.2%) advisors. Our findings highlight the underrepresentation of dermatologists in start-up ventures relating to dermatology.

Keywords: commercialization, dermatologist, entrepreneurship, innovation, venture capital

Introduction

Dermatology practice has a rich history of innovation. Indeed, we have seen advances in laser therapy, biologic therapy, molecular-based diagnostics, and information technology transform patient care [1]. For many dermatologists, these translational discoveries often take the form of academic publications or presentations, whereas others may pursue patents. We sought to better understand the role of dermatologists in start-up ventures related to dermatology.

Methods

We performed a retrospective review of privately held or acquired/merged dermatology companies in

the United States from January 1, 2010 to June 23, 2021 using Pitchbook, a database covering private capital markets [2]. Each company's focus area and the educational and professional background of its executive leadership team were determined through company websites, LinkedIn, Crunchbase, and Pitchbook [2-4]. The roles (e.g., chief executive officer (CEO), chief medical officer (CMO)) held by dermatologists for each company were also recorded.

Results

There were 105 companies analyzed. Only six (5.7%) companies had a dermatologist as CEO, 16 (15.2%) had a dermatologist founder, and 19 (18.1%) had a dermatologist advisor or board member. Of the 98 dermatologists involved in leadership, there were six (6.1%) CEOs, 21 (21.4%) founders, 11 (11.2%) CMOs, and 60 (61.2%) advisors. Seven of these dermatologists had an MBA, four had MPHs, 14 had PhDs, and five had master's degrees. Of those whose undergraduate degree information was available, one dermatologist obtained a BBA in business, eight obtained a BA in a humanities discipline, and 51 obtained a BA or BS in a science or math discipline. There was no noticeable trend of dermatologist involvement in startups over time, as the number of dermatologist founders per year fluctuated from zero to four from 2010 to 2021. Of the 117 founders represented, 33 (28.2%) had MD or MD joint degrees, 23 (19.7%) had PhDs, 34 (29.1%) had master's degrees, 26 (22.2%) had bachelor's degrees, and one (0.9%) had a JD. Of the 92 CEOs recorded, 15 (16.3%) had MD or MD joint degrees, 13 (14.1%) had PhDs, 36 (39.1%) had master's degrees, and 28 (30.4%) had bachelor's degrees (**Figure 1**).

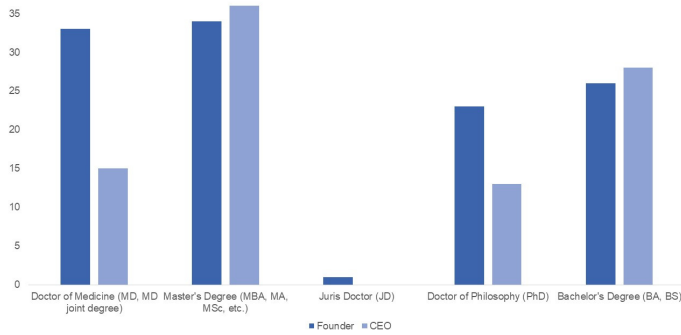


Figure 1. Highest level of education attained by founders and CEOs of dermatology-related private companies.

In terms of industry sectors, there were 29 (27.6%) pharmaceutical, 21 (20%) medical technology (medtech), 28 (26.7%) practice management, 14 (13.3%) biotechnology, and 13 (12.4%) aesthetics companies (**Figure 2**). There was greater representation of dermatologists in founder roles at companies in the practice management (25%) and biotechnology (28.5%) sectors, compared to medtech (9.5%) and aesthetics (7.7%).

Discussion

Our findings reveal the underrepresentation of dermatologists in companies related to their expertise. Further, when involved they predominantly fill the advisor role rather than other leadership roles. This could be attributed to the opportunity cost that comes with leading a company when one is already occupied as a physician, educator, and/or investigator. Additionally, there may be potential conflicts of interest and stigma attached to the process of commercialization. However, dermatologist involvement in innovation

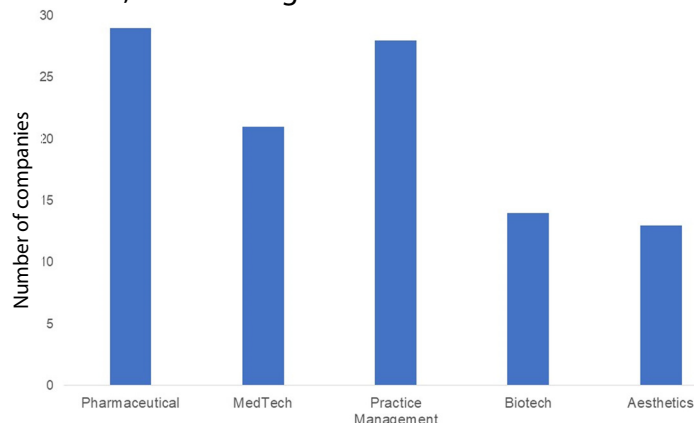


Figure 2. Distribution of different industry sectors among dermatology-related private companies.

still lags behind other specialties such as plastic surgery [5]. Our results also reveal dermatologists are more likely to be founders of practice management companies. This may come from a preference to pursue ventures that are closely tied to their daily practice in which they must optimize and balance care quality with efficiency.

As the field of dermatology continues to become an increasingly competitive specialty, more residency applicants pursue research opportunities to differentiate themselves [6]. However, our findings suggest this has not translated into greater involvement in innovation and entrepreneurship, as the number of dermatologist founders has remained stagnant since 2010. Although research is an integral component of healthcare innovation, more intentional training and educational programming in innovation may be required to foster innovators in dermatology. Some academic institutions have already moved to address this need and include Mayo Clinic with its Office of Entrepreneurship and Stanford University with its BioDesign center [7,8].

We note several limitations to this study. First, company websites, Crunchbase, LinkedIn, and Pitchbook pages may not have accurately or comprehensively reported the involvement of dermatologists. Second, the subjectivity in categorizing investment categories may have led to some dermatology companies being omitted. Additionally, some of these companies may be founded on intellectual property created by dermatologists and this information was not accessible for our study.

Conclusion

Future studies could consider surveying national dermatology societies for information such as attitudes toward innovation in addition to assessing collaboration between dermatology departments and institutional innovation or commercialization offices.

Potential conflicts of interest

The authors declare no conflicts of interest.

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