Incidence of Ophthalmic Start-Ups

William C. Stewart*, Shilla Marie Hernandez, Jeanette A. Stewart and Lindsay A. Nelson

PRN Pharma Farm, LLC, Las Vegas, NV1, USA

*Corresponding author: William C. Stewart, PRN Pharma Farm, LLC, Las Vegas, NV1, USA, E-mail: info@prnorb.com

Received date: April 25, 2018; Accepted date: May 14, 2018; Published date: May 24, 2018

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Abstract

Purpose: To evaluate the incidence of start-up company formation associated with new molecules or new indications for older medicines within 5 years of their description in ophthalmic peer-reviewed literature.

Methods: A retrospective, observational review of new ophthalmic pharmaceutical compounds or new indications of older products appearing on PubMed between June 01, 2010 and December 31, 2011.

Results: Included in this study were new compounds (n=21) or older compounds with a new indication (n=28). The most frequent indications were: anti-infectives (n=7), glaucoma (n=5), and anti-retinal neovascularization (n=4). No new ophthalmic companies were founded by the original author(s) for the originally described indication (0/49) within 5 years of publication. In contrast, 2 ophthalmic companies for a different ocular indication than originally described, and 2 outside ophthalmology for a systemic indication, were formed around 4 compounds. Evidence of at least some further work towards developing a new company past the initial publication was noted in 15 total cases and included: grants (n=4), press releases (n=3), filing a patent (n=15) and obtaining an issued patent (n=8).

Conclusions: There is a low progression rate from new ocular compounds described in the medical literature to company start-up formation within 5 years that might lead ultimately to commercialization of a new medication.

Keywords: Ophthalmology; Ophthalmic; Ocular; Start-up; Development

Introduction

New potential medications to treat ophthalmic patients often are discovered by professors at university laboratories. Unfortunately, developing a nascent discovery into a new company to commercialize a potential therapeutic product is time and cost intensive. Further, most professors are not trained in business development or working as a CEO. To complicate matters further, universities vary in their capacity to help develop new intellectual property derived from the school’s laboratories [1].

Unfortunately, little information exists in the medical or popular literature which explores the success of developing a new ophthalmic company based on findings discovered in university laboratories. The purpose of this article is to evaluate the incidence of start-up company formation associated with new molecules or new indications for older medicines within 5 years of their description in the ophthalmic peer-reviewed literature.

Materials and Methods

The study design was a retrospective, observational review of new ophthalmic pharmaceutical compounds or new indications of older products. Articles that appeared in PubMed (http://www.ncbi.nlm.nih.gov/pubmed) between June 01, 2010 and December 31, 2011 were collected. Due to the non-interventional, non-clinical participant study design of this research Institutional Review Board/Ethics Committee approval was not required. Medical devices, stem cells, delivery systems that did not alter the pharmacologic efficacy of the molecule itself, compound products, and commercially available herbal products were excluded.

Articles that presented a new ophthalmic pharmaceutical product or an older compound intended for a new indication were included. The following search terms were used in different combinations: new; pharmaceutical; treatment; ophthalmic; novel; potential; ophthalmology; and ocular. The following information was gathered from the PubMed article: corresponding author; ophthalmic product name; classification; indication; geographic location; affiliation and sponsorship. Follow up history of the new medicines (additional scientific articles; press releases; patents; websites; incubator; angel funding; grants) were confirmed using search engines (www.bing.com; www.Google.com; www.ClinicalTrials.gov; www.patents.google.com, www.ncbi.nlm.nih.gov/pubmed and www.sbir.gov).

Results

Included in this study were new compounds (n=21) or older compounds with a new indication (n=28) that were described in a peer-reviewed article published between July 2010 and December 2011 (total=49). No compounds that met the inclusion criteria were excluded.

The leading authors were located at a university (n=48) or a private institution (n=1). In total, 15 were in the United States and 34 non-United States, most commonly from the Pacific Rim (n=16). The most frequent indications were: anti-infectives (n=7), glaucoma (n=5), and anti-retinal neovascularization (n=4).

Using publicly available information, no new ophthalmic companies founded by the original author(s) for the originally described...
by dedicated professors and universities to discover new compounds to
patents, 4 were from someone other than the original authors.

Significant funding sources, greatly expanding their chance for funding success.

Contrast, 2 ophthalmic companies for a leading to a start-up company.

From laboratory discoveries, apart from too little clinical value
ultimately provide no clinical value, one might think that some
significant minority might possess treatment potential. Venture Capital
funds typically accept 2-4% of applications for funding [2,3].

Accordingly, start-ups then take their compounds to numerous
funding sources, greatly expanding their chance for funding success.

Recent research has shown 30% of ophthalmic start-ups will obtain
funding to progress their product development [4].

The reasons for the lack of creation of new ophthalmic start-ups
from laboratory discoveries, apart from too little clinical value
mentioned above, were not clear by the public data found. However, it
could be speculated on the following reasons related to the original
lead author; first, a lack of time and/or personnel resources; second, a
lack of knowledge in how to initiate a start-up company, a very
intimidating regulatory burden which is causes a high cost in time and
money to bring any product to market and last, a lack of seed funding
from the university, angels, or friends and family, to begin a start-up
process. In addition, universities vary widely in their ability and
interest to create attractive license deals for their professors [5]. Even a
well-meaning university may lack the knowledge, experience or
resources to effectively help discoveries.

How can one use these findings to help bringing new ocular
medicines to market? Our data indicate that a significant blockage
exists, from discovery of a potential new medicine to initiation of a
start-up that may parallel the dropout rate of new compounds from
lead product identification to commercialization [1]. This information
might provide a basis to help angels, universities, or government
agencies develop methods to assist professors either in seed funding,
education, or personnel availability to help them create start-ups that
might better supply unmet medical therapeutic needs of ocular
patients.

This study suggests that there is a low progression rate from new
ocular compounds described in the medical literature to company
start-up formation within 5 years that might lead ultimately to
commercialization of a new medication. This study is limited by the
range of follow up as company formation could have developed
afterwards in a few cases. Also, our dependence on public data may not
have uncovered very early startup without electronic evidence of
existence. More research is needed to further understand the
difficulties in creating a pharmaceutical start-up and how these new
entrepreneurs can best be assisted.

References
Review.
Description of ophthalmic pharmaceutical and device start-up