

## SPECIAL ARTICLE

# Post-PharmD Industry Fellowship Opportunities and Proposed Guidelines for Uniformity

Paul A. Larochelle, PharmD,<sup>a\*</sup> Dan K. Giang, PharmD, MBA,<sup>b\*</sup> Matthew A. Silva, PharmD,<sup>a</sup> Marisol Kcomt, PharmD,<sup>c</sup> Michael J. Malloy, PharmD,<sup>a</sup> Stephen Kay, BS Pharm,<sup>c</sup> and Michael T. Ku., PharmD, MBA<sup>c</sup>

<sup>a</sup>Massachusetts College of Pharmacy and Health Sciences – Worcester

<sup>b</sup>Almac Clinical Services, Durham, North Carolina

<sup>c</sup>Genzyme Corporation, Framingham, Massachusetts

The focus of this paper is to examine the surge in the development of post-PharmD industry fellowships (ie, pharmacy fellowship programs sponsored by the biopharmaceutical or pharmaceutical industry). These post-PharmD training programs do not fit the currently accepted definition of a pharmacy fellowship; therefore, the authors propose a new and distinct definition to encompass these fellowships. The authors provide program examples to showcase the establishment of the post-PharmD industry fellowship institutional centers. Finally, the authors provide recommendations to create uniformity in the programs of this relatively new category of post-PharmD training.

**Keywords:** fellowship, residency, industry, biopharmaceutical, accreditation

## INTRODUCTION

Doctor of pharmacy (PharmD) graduates are faced with the decision of whether to pursue post-PharmD training or immediately join the workforce upon graduation. Graduates who choose to continue their professional training may then decide to complete a residency and/or a fellowship. Pharmacy residency is defined as “an organized, directed, postgraduate training program in a defined area of pharmacy practice.”<sup>1</sup> Pharmacy residencies improve skills in patient care through immersion in general practice hospital settings, specialty practice settings (eg, cardiology, anticoagulation, infectious disease, pediatrics, critical care, and hematology/oncology), and ambulatory settings, including general outpatient clinics, family medicine clinics, and retail pharmacy-based clinics. Pharmacy residents assume extended responsibilities and are involved in multiple projects, including mandatory research, that provide wide exposure to general pharmacy practice. The number of pharmacy residency programs increased to 770 in 2005; however, the percentage of pharmacy students pursuing such training has remained constant.<sup>2</sup>

A pharmacy fellowship, on the other hand, is defined as “a directed, highly individualized, postgraduate program designed to prepare the participant to become an independent researcher.”<sup>1</sup> By providing a baseline skill

set (eg, grant writing) and familiarity with the scientific research process, pharmacy fellowships prepare pharmacists to become principal investigators. A traditional pharmacy fellowship also may provide pharmacists with skills for work in the biopharmaceutical and pharmaceutical industries. Since research is built on a foundation of skills, pharmacists are expected to come to fellowships having developed relevant basic skills, as through experience in pharmacy practice or in a residency, and to maintain those skills throughout the fellowship program.<sup>1</sup>

Pharmacy fellowships in the United States today range in affiliation as well as purpose and objective.<sup>3</sup> They can be categorized as traditional or industrial, with traditional fellowships adhering to the current definition of a pharmacy fellowship while industry fellowships do not. A surge in industry fellowships warrants a distinct definition that covers these fellowships.

Web sites of all ACPE-accredited pharmacy schools were examined to identify availability of traditional and industrial fellowship programs; identification was based on the proposed categorization provided below. Also examined were the *ACCP Directory of Residencies, Fellowships and Graduate Programs* and the *PPS Advance Job Listing Book, 2007 Edition*.<sup>3,4</sup> Finally, Google search engine was used to account for programs that may not be listed on pharmacy school web pages or in directories that require programs to manually submit and maintain data. Identified programs from these sources were then compiled in a database and categorized by program type.

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**Corresponding Author:** Michael T. Ku, PharmD, MBA.  
15 Pleasant Street Connector, Framingham, MA 01701.  
Tel: 508-270-2054. Fax: 508-424-4484.

\*These authors contributed equally to the article.

## CATEGORIZATION OF FELLOWSHIPS

Of the pharmacy fellowships found, 131 programs and 2 distinct categories were identified in the database. The first group of programs ( $n = 73$ ) focused on providing fellows experiences and skills essential to conducting scholarly research (Appendix 1). These programs specifically stated that approximately 80% of the fellow's time would be spent working on research with the aim of becoming capable of independently preparing and publishing results. These programs also typically provided opportunities for fellows to enroll in graduate courses in such areas as biostatistics and the basic sciences. These programs are called traditional pharmacy fellowships in this article.

A second group of programs ( $n = 58$ ) emerged in the last 25 years to help fellows learn more about working environments in the biopharmaceutical and pharmaceutical industry (Appendix 2). These programs encourage publication of original work but their main focus is developing skills that support careers in the biopharmaceutical and pharmaceutical industry. These fellowships also typically include the words "pharmaceutical," "biopharmaceutical," and "industrial" or "industry" in their names. The programs often are associated with academic institutions ( $n = 48$ ), although some programs ( $n = 10$ ) have no academic affiliation and are offered solely by sponsoring companies. The time span of these programs is another variable feature, with commitments of either 1 or 2 years, compared to 1 to 3 years in traditional pharmacy fellowship programs. These newer programs are called post-PharmD industry fellowships in this article.

Goals and objectives of post-PharmD industry fellowships do not meet the definition of a traditional pharmacy fellowship. These programs are not highly individualized, and their intent is not to produce principal investigators; rather, they follow a defined set of objectives to prepare candidates for a career in industry. Besides the deviation from the traditional definition, other inconsistencies may contribute to confusion over how the industry fellowship qualifies as a pharmacy fellowship. For example, Centocor Incorporated and Bristol-Myers Squibb offer 1-year postgraduate training programs with similar objectives for pharmacists in medical information; Centocor calls its program a residency but Bristol-Myers Squibb calls its program a fellowship.<sup>5,6</sup> In addition, Centocor is not affiliated with an academic institution but its program description mentions the opportunity for fellows to serve as adjunct faculty members in a nearby college. Conversely, the medical information pharmacy fellowship at Bristol-Myers Squibb is cosponsored by the Rutgers Ernest Mario School of Pharmacy, where fellows are appointed adjunct faculty members.

Still other programs seem to offer a traditional pharmacy fellowship as well as exposure to opportunities in the biopharmaceutical and pharmaceutical industry. Such programs include the Post-Doctoral Pharmaceutical Industry Fellowship sponsored by Novartis and the Pharmacometrics Fellowship sponsored by either Pfizer or Novartis. Both pharmacy fellowships are affiliated with the University at Buffalo State University of New York, School of Pharmacy and Pharmaceutical Sciences.<sup>7,8</sup>

Given such inconsistency, categorizing the programs might help pharmacy postgraduates make sense of the many choices available to them. To help distinguish the differences between these post-PharmD programs, the following categories are recommended (Figure 1):

### Traditional Pharmacy Fellowships

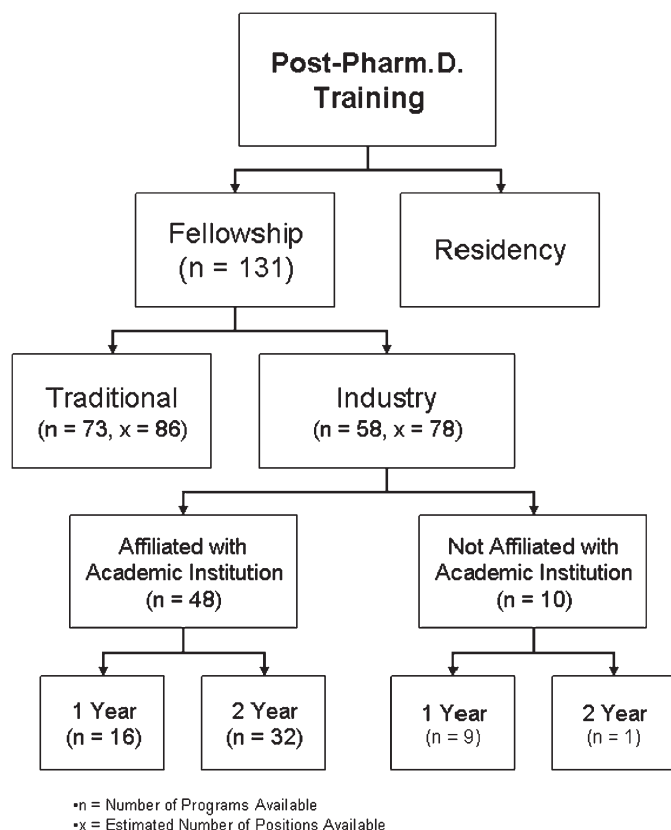
- Strictly adhere to the fellowship definition set forth by the pharmacy ad hoc committee in 1986.
- Are sponsored by the biopharmaceutical or pharmaceutical industry or by an institution (eg, hospitals and universities).
- State as their objective the learning of a skill set tied to scientific research that supports successful independent research.
- Are 2 or 3 years in duration.

### Post-PharmD Industry Fellowships

- Deviate from the fellowship definition set forth by the pharmacy ad hoc committee in 1986.
- Are sponsored by the biopharmaceutical or pharmaceutical industry and may or may not be cosponsored by an academic institution.
- State as their primary objective the learning of a skill set in a respective industry department—such as clinical research, regulatory affairs, drug safety, and marketing—that supports a career in the biopharmaceutical and pharmaceutical industry.
- Are 1 or 2 years in duration.

Using these categories, drug information residencies—such as the program at Centocor Inc—fall under post-PharmD industry fellowship.<sup>5</sup> An argument can be made that residency is the more appropriate term to use because whether drug information is disseminated by a drug information center in a hospital or from a pharmaceutical or biopharmaceutical company, the pharmacy skills and knowledge required to perform the duty are the same. However, since the specific criteria of post-PharmD industry fellowships are met by these programs, the term fellowship could be used to mitigate the potential confusion in naming consistency amongst such programs.

Programs that meet the traditional definition of a fellowship and provide experience in the biopharmaceutical and pharmaceutical industry fall under the category of traditional pharmacy fellowships. These programs focus



**Figure 1.** Current Post-Pharm.D. Fellowship Training Opportunities.

on intensive research—identifying them as post-PharmD industry fellowships would obscure their true purpose.

In the 2007 edition of the *PPS Advance Job Listings* catalog, some programs awarded a master’s or doctor of philosophy degree, including the Fellowship in Instructional Design and Evaluation sponsored by the University of Maryland and the Pharmacometrics Fellowship sponsored by the University at Buffalo mentioned previously.<sup>8,9</sup> It is difficult to distinguish between a pharmacy fellowship that leads to an advanced degree and a typical pharmacy graduate program. For the purpose of this manuscript, typical pharmacy graduate programs are not included in either the traditional pharmacy fellowship or post-PharmD industry fellowship category.

There is no single, mandatory, continuously updated repository of pharmacy fellowships. The identification and categorization of pharmacy fellowships was meticulously completed using the best available information. Any omission or improper categorization was unintentional.

## CASE STUDIES

With the inception and growth of more fellowship programs, some places of higher education have emerged as hubs for such opportunities. The largest and most prom-

inent places are Rutgers University and the Massachusetts College of Pharmacy and Health Sciences-Worcester (MCPHS); Rutgers offers the Institute for Pharmaceutical Industry Fellowships, and MCPHS its Biotechnology Fellowship program. Descriptions of the 2 programs are provided below as examples of academic-sponsored post-PharmD industry fellowships.

### Rutgers University

Rutgers University works with 13 industry partners to provide more than 70 pharmacy fellowships each year in clinical research, marketing, drug information, and regulatory affairs. The school, involved in these efforts since 1984, established the Institute for Pharmaceutical Industry Fellowships in 2002. The program has over 450 alumni who work in more than 40 pharmaceutical companies.<sup>10</sup> Brochures for the Rutgers University programs define the purpose of a fellowship as the means for preparing for a pharmaceutical industry career. Other partners note the potential for career advancement as a main objective of the training. With education in basic skills and immersion in practical experience, the Rutgers program is a springboard to employment in the pharmaceutical industry.

Those enrolled in the Rutgers program can also work as educators and participate in projects approved by preceptors—though brochures from Rutgers’ partnering programs do not explicitly describe the scope of the teaching experience that fellows might engage in. According to the Rutgers Pharmaceutical Industry Fellowship Web site, fellows have several options for completing the academic component of the program.<sup>10</sup> Either under tutelage of a Rutgers faculty member or independently (with or without the help of other fellows), fellows can publish an article, complete a rotation in a Rutgers teaching/clinical site, develop marketing campaigns that promote the fellowship program, serve on the program’s staff as a co-chief fellow, or oversee projects that enhance or benefit the Rutgers program.<sup>10</sup>

### Massachusetts College of Pharmacy and Health Sciences – Worcester

Sponsorship at Massachusetts College of Pharmacy and Health Sciences–Worcester comes primarily from biopharmaceutical and biotechnology companies. MCPHS fellows can choose from programs in regulatory affairs (sponsored by Biogen Idec), clinical research (sponsored by Genzyme), and drug information (sponsored by Cubist). Like the Rutgers program, the college’s programs immerse fellows in the working environment as preparation for a career in industry. The MCPHS program has room for approximately 6 fellows each year.

One of the program’s self-stated purposes is to provide “opportunities for teaching and research with MCPHS

Faculty.”<sup>11</sup> Fellows work as coordinators in a course on biopharmaceutical development, preparing class topics and examinations, selecting guest lecturers, and leading discussions. Fellows may also participate in other MCPHS courses, including Pharmacotherapeutics. Fellows are also encouraged to publish articles alone or in collaboration with a faculty preceptor, and to participate in scholarly and academic endeavors.

## **PROPOSED GUIDELINE FOR UNIFORMITY**

A search of available post-PharmD fellowships yielded 131 programs. Of these 131 programs, only 11 were listed as ACCP Peer-Reviewed Fellowships.<sup>4</sup> In other words, approximately 8% of fellowship programs in the United States have been accredited or reviewed by an independent source. Of the 11 listed peer-reviewed fellowships, all focus on research, and many stress independent research as a key component of the fellowship. There is a list of 431 residencies on the ACCP Web site, of which 291, or approximately 67%, are accredited by ASHP or CSHP.<sup>4</sup> Clearly, for independent review or accreditation, a disparity exists between these 2 types of programs.

There also are varying degrees in the participation and roles of academic institutional partners. While programs promote affiliation with colleges and universities of pharmacy, the accompanying literature does not reveal in detail how the institutions participate in their affiliate roles. To provide an environment conducive to the best learning experience, programs cosponsored by an academic institution should seek increased participation from fellows as well as industry partners.

Many new post-PharmD industry fellowships have similar goals. A guideline overview would improve uniformity of post-PharmD industry fellowships. The structure of this proposal was modeled on ACCP Guidelines for Clinical Research Fellowship Training Programs; using the ACCP guidelines as a model for the proposed guidelines establishes continuity with traditional training opportunities.<sup>12</sup>

### **Proposed Post-PharmD Industry Fellowship Guidelines Overview**

- The purpose of the fellowship program is to develop competency and the skill set necessary to serve as a pharmacist in various roles in the biopharmaceutical and pharmaceutical industry. Post-PharmD industry fellowships should only be available to pharmacy graduates.

#### **Training Program Requirements**

- The program should be cosponsored by an academic institution.
- The program should have administrative support from the sponsoring institutions.

- The sponsoring institution must have earmarked sufficient funding specifically for the fellowship that will allow an individual to complete the program without issue for the predetermined and allotted length.
- The program must have a dedicated fellowship preceptor who is reasonably accessible in person to the fellows.
- The program must have appropriate facilities to conduct the objectives and duties of the fellowship.
- The fellow must have access to computer technology and scientific literature sources.
- The fellow should be provided with adequate workspace necessary to complete their duties.

#### **Preceptor Qualifications**

- The preceptor should work in the biopharmaceutical or pharmaceutical industry and have ample experience in the program’s area of focus or industry fellowship training.

#### **Fellowship Applicant Criteria**

- The applicant must have a doctoral degree or equivalent in pharmacy.
- The applicant should have demonstrated an interest in or an aptitude for a career in industry.

#### **Fellowship Experiences**

- The duration of the program, 1 or 2 years, is dependent on the required purpose and objectives of a particular program (ie, sufficient time is allotted to fulfill the purpose and objectives).
- The fellow may rotate through other departments; however, approximately 75% of the fellow’s time should be concentrated on the area of focus.
- The fellow should complete 2 scholarly activities, which can be in the form of a:
  - Poster presentation at a national meeting
  - Textbook contribution
  - Journal article or other publication
- The fellow should be required to attend at least 1 professional meeting relating to the fellowship program.
- The fellow should be instructed on and exposed to the drug development process.
- The fellow should have the opportunity to participate in educational forums, including but not limited to:
  - Didactic instruction of students in a classroom environment
  - Experiential instruction of pharmacy students

Having proposed a guideline for creating uniformity among the post-PharmD industry fellowships, it is appropriate to question whether the defined similarities could provide the basis for accreditation of such postgraduate

training experiences. ASHP and ACCP have not formally established the criteria for accreditation of post-PharmD industry fellowships. Furthermore, the unique nature and content of these programs brings into question which organizations would be the most appropriate to collaborate and provide the peer review services necessary. Given that corporations in the biopharmaceutical and pharmaceutical industry have served as major contributors to the funding and availability of these fellowships, a committee composed of individuals from such organizations may be suitable for the review process. Since a proposed requirement for scholastic involvement of fellows in academic activities has been included, academic administrators from colleges of pharmacy would be prime candidates as members of an accrediting or peer review team.

Finally, peer review and accreditation of postgraduate training programs has been managed in the past by national pharmacy organizations; therefore, such organizations may provide expertise in the formal process. To accurately determine the answer to this consideration, dialogue should be initiated between pharmacy organizations, program directors from industry, and administrators of sponsoring academic institutions.

## SUMMARY

A pharmacy ad hoc consortium was formed in 1986 to clearly define the terms residency and fellowship. The ASHP Commission on Credentialing recommended the formation of the ad hoc consortium because the lack of conformity in the use of the terms residency and fellowship had the potential to misinform or mislead applicants regarding program purposes and content.<sup>1</sup> Presently, there is a lack of uniformity in the use of the term fellowship. To provide progress in the development of such programs, the creation of a third category, post-PharmD industry fellowships, allows students and faculty members to more succinctly grasp the objectives of such programs.

As post-PharmD industry fellowships have emerged and grown in number and availability, a need to create a categorization for such programs has materialized since the goals and objectives are different from the goals of traditional pharmacy fellowships. Unfortunately, few if any publications exist that address the unique and distinguishing elements of post-PharmD industry fellowships from their traditional pharmacy fellowship counterparts. The American College of Clinical Pharmacy, which oversees voluntary peer review of research fellowship training programs, does not aim to standardize fellowship training so as to preserve the highly individualized nature of these experiences.<sup>13</sup>

Through our examination of the literature and information, we believe that it is possible to create an accred-

itation process that standardizes the basic elements of these programs without compromising the individual skill sets learned during the training period. The first step in this effort would be the adoption of our definitions and guidelines for uniformity so as to assure participants a well-rounded experience. Our categorizations provide the basis for determining which programs will be overseen in such a process.

Postdoctoral training programs for pharmacists include residencies or fellowships. Pharmacy residencies are for those candidates who wish to pursue a career in patient care activities, while traditional pharmacy fellowships prepare pharmacists for careers as independent researchers in academia and/or industry. For candidates interested in the biopharmaceutical or pharmaceutical industry, post-PharmD industry fellowships provide skills and knowledge in clinical research, regulatory affairs, medical affairs, medical information, pharmacovigilance, and other areas essential to a successful industry career.

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Appendix 1. Post-PharmD Traditional Pharmacy Fellowships Available in the United States, 2008

<b>Sponsor College</b>	<b>Sponsoring Organization</b>	<b>Length of Program, Years</b>	<b>Specialties</b>	<b>Available Positions<sup>a</sup></b>
Creighton University	Creighton University Medical Center	2	Critical Care	1
Duquesne University	-	1	Ambulatory Care	2
Howard University	-	2	Oncology and Critical Care	1
Massachusetts College of Pharmacy and Health Sciences – Boston	Brigham and Women’s Hospital	2	Outcomes Research and Informatics	1
Massachusetts College of Pharmacy and Health Sciences – Worcester	Charles River Labs	2	Pharmaceutical Sciences	1
	Saint Vincent Hospital	1	Patient Safety	1
Northeastern University	Tufts-NEMC	2	Critical Care	1
The Ohio State University	-	-	Neurology / Epilepsy	-
	-	2	Geriatrics / Alzheimer’s Disease	-
	-	2	Pediatric Infectious Disease	-
Purdue University	-	2	Pharmacokinetics / Cardiology	1
South Carolina College of Pharmacy	-	2	Infectious Disease	3
University of Arkansas for Medical Sciences College of Pharmacy	-	-	Cardiovascular, Infectious Disease, Pediatrics	-
University at Buffalo, The State University of New York	Novartis	2-3	Drug Development	2
	-	1-2	HIV Pharmacotherapy	-
	Clinical Pharmacokinetics Lab (CPL)	2	Infectious Disease – Clinical Trials and PK/PD	-
	-	-	Molecular Imaging	-
	-	1-2	Transplant Immunosuppressive Pharmacology	-
	State University of New York Upstate Medical University	-	Toxicology and Emergency Medicine	-
	Pfizer or Novartis	3	Pharmacometrics PK/PD	-
University of Connecticut	Hartford Hospital	2	CV Outcomes Research	3
University of Florida	-	2-3	CV Pharmacogenomics	1
	-	2	Pulmonary Clinical Research	1
University of Illinois at Chicago	UIC Center for Pharmaco-economic Research	2	Antithrombosis Outcomes	1
		2	Managed Care	1
University of Maryland	Maryland Poison Center	2	Clinical Toxicology	1
	-	2	Instructional Design and Evaluation	1
University of Michigan	-	2	Critical Care / Nephrology	1
University of Minnesota	-	2-3	Clinical Neuropharmacology	1
		2	Critical Care	1
		2	CV Pharmacotherapy	1
		2	Infectious Diseases and Pharmacodynamics	1
University of Missouri Kansas City	-	1	Drug Policy Development and Management	2
University of Nebraska	Nebraska Medical Center	2	Critical Care / Infectious Disease	1
		2	Infectious Disease / Antimicrobials	1
	-	3	Infectious Disease / Antiretroviral	1

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Appendix 1. Continued.

<b>Sponsor College</b>	<b>Sponsoring Organization</b>	<b>Length of Program, Years</b>	<b>Specialties</b>	<b>Available Positions<sup>a</sup></b>
University of New Mexico	New Mexico Poison and Drug Information Center	2	Clinical Toxicology	1
	University of New Mexico Health Sciences Center	2	Nephrology	1
University of North Carolina at Chapel Hill	-	2	Heart Failure Pharmacotherapy	-
		2-3	HIV Pharmacology	-
		2-3	Oncology	-
University of Pittsburgh	-	2	Outcomes Research and Epidemiology	1
University of Rhode Island	-	2	Infectious Disease / Pharmacodynamics	1
University of the Sciences in Philadelphia	-	1	Cardiology	1
		2	Pulmonary	1
University of Tennessee, Memphis	-	-	Cardiology	-
		-	Nutrition Support	-
		-	Neuropharmacology	-
		-	Pediatric Pharmacotherapy	-
		-	Pharmacokinetics and Pharmacodynamics	-
		-	Clinical Sciences	-
University of Texas at Austin	-	-	Clinical Sciences	-
University of Utah	-	2	Outcomes Research\	-
		2	Pain and Palliative Care Pharmacotherapy Research	-
University of Washington	-	2	Experimental Cardiovascular Pharmacology	-
		1-2	Elmer M. and Joy B. Plein Fellowship for Excellence in Pharmacy Education	-
		2	Immunology Therapeutics and Solid Organ Transplantation	-
		2	Pharmacokinetics	-
Virginia Commonwealth University	-	-	Infectious Diseases	-
Wayne State University	-	2	Infectious Diseases and Pharmacodynamics	4
Western University of Health Sciences	-	2	Pharmacogenomics	1
		2	Transplant / Translational Research	2
No Academic Partner	Cetero Research	-	Pharmacometric / Drug Development	-
	Charleston Area Medical Center Health Education	2	Drug Development / Cardiovascular Outcomes	1
	National Institutes of Health	2	Ambulatory Care / Research	1
		2	Vascular Medicine	1
	St. Jude Children's Research Hospital	3	Oncology and Pharmacokinetics	2
		3	Oncology and Pharmacogenetics	2
	Sunnybrook Health Sciences Center	2	Pharmacokinetics	1
	University Health System Consortium	1	Pharmacoepidemiology	1
	UT M.D. Anderson Cancer Center	3	Oncology and Translational Research	1
	VA Medical Center New York	1	Palliative Care	1
	Veterans Affairs Cooperative Studies Program	2	Pharmacoeconomics	1
		2	Pharmacy Practice	1

<sup>a</sup>Dashes used to indicate programs that do not specify the number of positions available. For the purposes of this paper, these programs are assumed to have 1 open position per year

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Appendix 2. Listing of Post-PharmD Industry Fellowships Available in the United States, 2008

<b>Sponsor College</b>	<b>Sponsor Company</b>	<b>Program Length, Years</b>	<b>Programs</b>	<b>Available Positions</b>
Massachusetts College of Pharmacy and Health Sciences – Worcester	Biogen Idec	2	Drug Safety and Regulatory Affairs	2
	Cubist	2	Drug Information and Medical Affairs	1
	Genzyme	2	Clinical Research and Investigational Products	1
Rutgers	Bayer Healthcare Pharmaceuticals	2	Medical Affairs	2
	Bimark Center for Medical Education	1	Continuing Medical Education	1
Rutgers	Bristol-Myers Squibb	1	Medical Information	12
			Medical Affairs	
			Medical Strategy	
			Global Marketing	
			Strategic Analysis and Intelligence	
	Daiichi-Sankyo	1	Medical Affairs	2
			Exploratory Clinical Development	
	Novartis	2	Clinical Development	9
			Medical Affairs	
			Drug Regulatory Affairs	
			Marketing	
			Project Management	
			Integrated Medical Safety	
Modeling and Simulation				
Marketing Research				
Marketing Research				
Medical Communications				
Pfizer Consumer Health	2	Business Intelligence	2	
		Medical Affairs/Clinical Development		
		Regulatory Affairs		
Roche	2	Pharmacovigilance and Medical Information	7	
		Clinical Operations		
		Drug Regulatory Affairs		
Sanofi Aventis	1	Drug Safety Risk Management	4	
		Clinical Pharmacology		
		Medical Education & Scientific Publications		
		Medical Information Services		
Schering-Plough	2	U.S. Managed Markets	3	
		Health Economics and Outcomes Research		
		Clinical Research		
Tibotec Therapeutics	1	Early Clinical Research and Experimental Medicine	1	
		Regulatory Affairs		
TKL Research	2	Market Research / Business Analytics	1	
			Clinical Research	1



Appendix 2. Continued.

<b>Sponsor College</b>	<b>Sponsor Company</b>	<b>Program Length, Years</b>	<b>Programs</b>	<b>Available Positions</b>
St. John's University	Forest Research	2	Clinical Drug Development/ Medical Affairs Regulatory Affairs	2
University of the Sciences in Philadelphia	PharmaWrite	1	Medical Communications	1
University of Illinois Chicago	TAP Pharmaceuticals	2	Health Economics and Outcomes Research	1
University of North Carolina at Chapel Hill	PPD, United Therapeutics, King Pharmaceuticals, GSK	2	Clinical Research and Drug Development Fellowships	1
	Quintiles Inc. and GlaxoSmithKline	2	Pharmacokinetic/ Pharmacodynamic Fellowships	1
University of Southern California	Allergan, Inc.	1	Regulatory Affairs and Drug Development	1
University of Texas	Scott & White Health Plan Pharmacy / Novartis	2	Pharmacoeconomics	1
University of Washington	Allergan, Inc.	2	Pharmaceutical Outcomes Research and Policy	1
No Academic Partner	Centocor Inc	1	Medical Information Residency	1
	Eisai, Inc.	1	Drug Information Residency	1
	Eli Lilly	1	Clinical Research	6
	PPD (Contract Research Organization)	1	Drug Information Resident	1
	Procter and Gamble	1	Clinical Research Drug Information Investigational Products Sales and Marketing	4
	Roche Laboratories, Inc.	1	Drug Information Resident	2
	Upsher-Smith Laboratories	2	Clinical Research	1