

VU Research Portal

Link, Merge, Grow

Romasanta, A.K.

2020

document version

Publisher's PDF, also known as Version of record

[Link to publication in VU Research Portal](#)

citation for published version (APA)

Romasanta, A. K. (2020). *Link, Merge, Grow: How Academia, SMEs and Big Pharma Seized Opportunities in Fragment-Based Drug Discovery*.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

E-mail address:

vuresearchportal.ub@vu.nl

Table of Contents

Account and Funding	5
Abbreviations	6
Overview	7
Table of Contents	8
Tables	12
Figures	13
1. Introduction	17
1.1. Pharmaceutical Industry	21
1.1.1. Drug Discovery	22
1.1.2. Fragment-based Drug Discovery.....	23
1.2. Scientific and Technological Fields.....	25
1.2.1. The Role of Proponents in Field Development.....	28
1.3. Scope of the Research	31
1.4. Research Objectives.....	32
2. Innovation in Pharmaceutical Research and Development	37
Abstract.....	38
2.1. Introduction	39
2.2. Methodology	41
2.3. Innovation in Pharmaceutical R&D	49
2.3.1. Macro	54
2.3.2. Meso	55
2.3.3. Micro	58
2.4. Innovation Topics in Practitioner Journals.....	61
2.5. Towards Highly Engaged Innovation Research	65
2.6. Conclusions	68
3. Development of Fragment-based Drug Discovery	71
Abstract.....	72
3.1. Introduction	73

3.2.	Bibliometric Methods.....	74
3.3.	Results and Discussion.....	75
3.3.1.	Emergence as “Fragment-based Drug Discovery”	75
3.3.2.	From Ideas to Application: The Role of Industry	77
3.3.3.	Knowledge Transfer: The Role of University-Industry Collaboration.....	83
3.3.4.	Recombining Knowledge from Other Scientific Fields.....	87
3.4.	Conclusions	92
4.	Commercialization by New Ventures.....	95
	Abstract.....	96
4.1.	Introduction	97
4.2.	Theoretical Framework	98
4.2.1.	Resource Mobilization in New Fields.....	99
4.2.2.	Resource Mobilization by New Firms	100
4.2.3.	Fragment-based Drug Discovery.....	101
4.3.	Methods	103
4.3.1.	Development of FBDD Field	104
4.3.2.	Case Study of Four Companies in FBDD.....	105
4.3.3.	Data Analysis	106
4.4.	Results	107
4.4.1.	Entrepreneurial Firms in FBDD.....	107
4.4.2.	Four companies in FBDD.....	111
4.4.3.	Firms’ Resource Mobilization.....	118
4.5.	Discussion and Conclusions.....	126
4.6.	Appendix	129
5.	Adoption in Big Pharma.....	131
	Abstract.....	132
5.1.	Introduction	133
5.2.	Theoretical Framework	135
5.2.1.	Fragment-based Drug Discovery.....	138

5.3.	Methods	141
5.3.1.	The Emergence of FBDD across Big Pharma	141
5.3.2.	Comparison of FBDD Absorption in Two Big Pharma Firms	141
5.3.3.	Data Analysis	142
5.4.	Findings on the Adoption of FBDD	143
5.4.1.	The Emergence of Fragment-based Drug Discovery in Big Pharma	143
5.4.2.	Knowledge Absorption in Two Large Pharmaceutical Firms	148
5.5.	Processes of Absorption of FBDD	152
5.5.1.	Seeking and Recognizing Value	152
5.5.2.	Assimilation	153
5.5.3.	Acquiring and Transforming	156
5.5.4.	Exploitation	158
5.6.	Discussions and Conclusions	160
5.6.1.	Managerial Implications	163
5.7.	Appendix	164
6.	Individual Researchers	169
	Abstract	170
6.1.	Introduction	171
6.2.	Methods	172
6.3.	Researchers in Drug Discovery	174
6.4.	Overview of Innovative Training Networks	177
6.4.1.	ONCORNET	178
6.4.2.	FRAGNET	178
6.5.	Perceived Benefits of ITNs	182
6.6.	Discussion and Conclusions	188
6.7.	Appendix	191
7.	Conclusions	193
7.1.	Summary	194
7.2.	Recommendations	197

7.2.1. Academia	197
7.2.2. Practitioners in the Pharmaceutical Industry	197
7.2.3. Policy.....	198
7.3. Future Research	199
References.....	204
Acknowledgments	230
Executive Summary.....	232
Executive Summary (Dutch).....	234
About the Author	237