

Portfolio Analysis of the Small Business Programs at the National Institute of Dental and Craniofacial Research

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Poster Meeting Sponsored by the NIH Office of Portfolio Analysis
July 23, 2014, Bethesda, MD

What defines this work as Portfolio Analysis?

Portfolio of Interest

SBIR/STTR applications and awards

NIDCR, FY 2000– FY 2012

Why is this a portfolio?

Unifying characteristics of the projects

Shared program mission and goals

Limited grant mechanisms

(R41,42,43,44)

Common data elements

Common available data



Why was the Portfolio Analysis conducted?

Document program activity since 2000

Document program status

Analyze fundamental aspects of the program

- Scientific peer review
- IC funding decisions
- Program and project management
- Outcomes



How was the Portfolio Analysis conducted?

- ▶ Study methods
 - document reviews and secondary analyses of existing data
 - contextual data from multiple public websites
 - quantitative data from public and internal NIH and NIDCR databases
 - new data from two formal interviews
 - NIDCR SBIR/STTR Program Coordinator
 - NIDCR's primary Program Officer for SBIR/STTR awards.



Characteristics of the Portfolio Analysis

- One primary portfolio, multiple subsets
- Comparison portfolios (NIH, comparable ICs)
- Primarily descriptive
- Marginally evaluative
- Quantitative and qualitative
- Graph, table, and text presentations of results
- Program recommendations



What are the NIDCR Small Business Programs?

The SBIR (Small Business Innovation Research) and STTR (Small Business Technology Transfer) programs are Congressionally-mandated set-aside programs for domestic small business concerns to engage in Research/Research and Development (R/R&D) that has the potential for commercialization.



Objectives of SBIR

- ▶ using small businesses to stimulate technological innovation;
- ▶ strengthening the role of small business in meeting Federal R/R&D needs;
- ▶ increasing private sector commercialization of innovations developed through Federal SBIR R&D;
- ▶ increasing small business participation in Federal R/R&D;
- ▶ fostering and encouraging participation by socially and economically disadvantaged small business concerns and women-owned business concerns in the SBIR program.



Funding phases

- ▶ Phase I: Feasibility or proof-of-concept study (6 – 12 months, can receive funding up to \$150,000)
- ▶ Phase II: Full research or R&D (2 years, can receive funding up to \$1,000,000)
- ▶ Phase III: Commercialization (through private funding)

Mechanisms used by NIDCR

- ▶ R41 STTR, Phase 1
- ▶ R42 STTR, Phase 2
- ▶ R43 SBIR, Phase I
- ▶ R44 SBIR, Phase II



The STTR and SBIR programs are similar in that both programs seek to increase the participation of small businesses in Federal R&D and to increase private sector commercialization of technology developed through Federal R&D. The unique feature of the STTR program is the requirement for the small business concern applicant organization to formally collaborate with a research institution in Phase I and Phase II.



Analysis goal: Document program history

Portfolio subsets

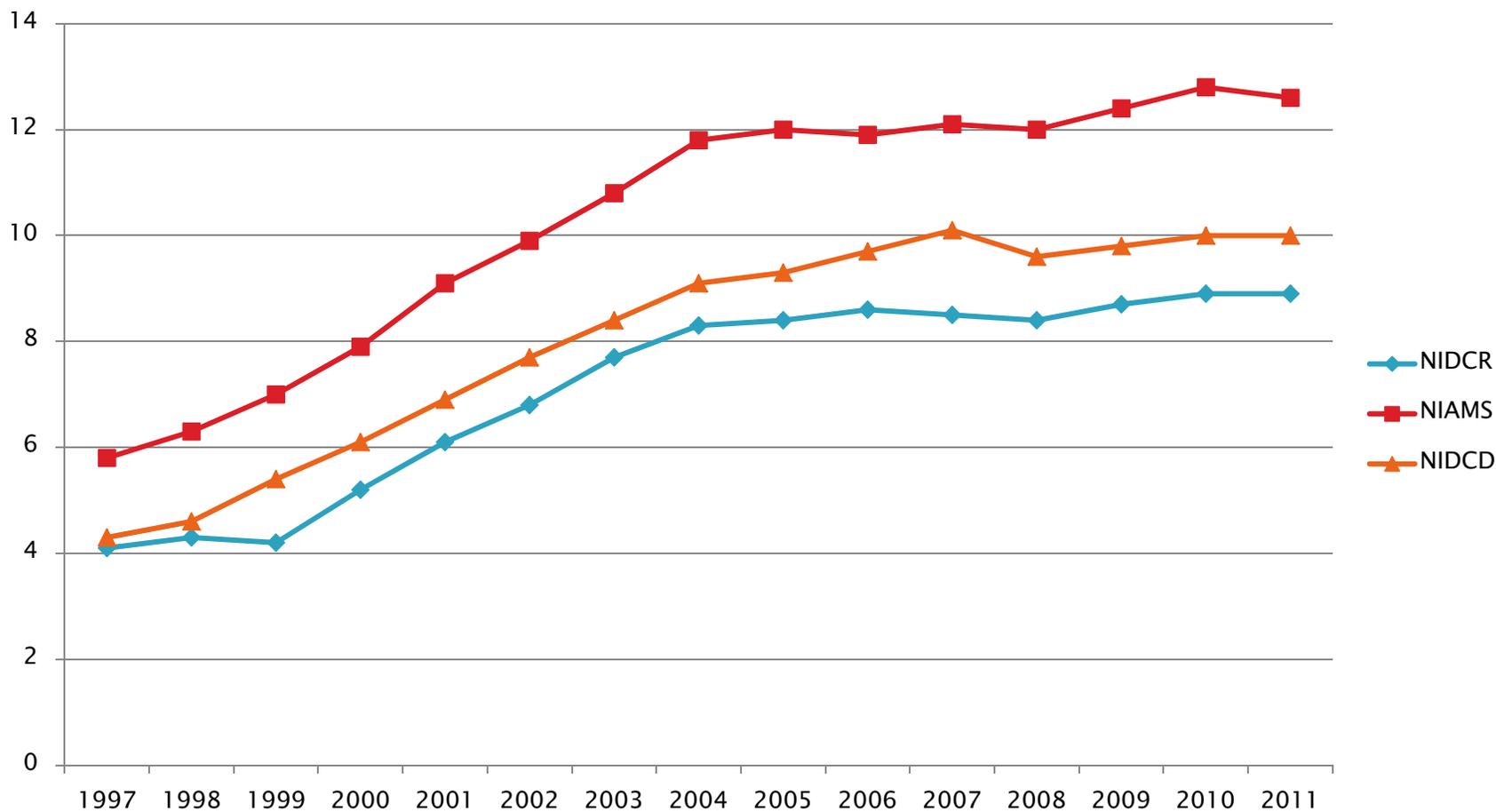
- NIDCR 2000–2010
 - Data source: NIDCR internal database
 - Similar data available in QVR
 - Number of awards, award amounts, % extramural funding by Year and Mechanism
- NIDCR and two comparison ICs, 1997–2011
 - Data source; NIH Data Book
 - Annual activity: Applications, awards, and award amounts



Number and Award Amounts of SBIR/STTR Projects by Year and Mechanism, FY 2000-2010

YEAR	00	01	02	03	04	05	06	07	08	09	10
# Projects											
R41				3	6	1	4	1	1	4	2
R42				0	1	2	1	2	2	1	2
R43				6	13	24	10	15	7	12	12
R44				16	15	12	15	12	12	12	12
total	38	40	28	25	35	39	30	30	22	29	28
Cost (\$Mil)											
R41				0.4	0.6	0.01	0.5	0.1	0.2	0.5	0.2
R42				0	0.3	0.8	0.5	0.8	0.7	0.4	0.8
STTR %				0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3
R43				0.7	1.6	3.0	1.3	2.3	0.9	1.8	2.0
R44				6.6	5.7	4.5	6.3	5.3	6.6	6.0	6.0
SBIR %				2.8	2.6	2.7	2.8	2.8	2.8	2.8	2.7
total	4.851	6.119	6.751	7.671	8.281	8.375	8.575	8.515	8.381	8.719	8.921
DER budget				257.9	277.6	280.1	274.2	273.5	271.8	280.4	296.5
SBA %				2.97	2.98	2.99	3.13	3.11	3.08	3.11	3.01

SBIR and STTR Funding (in \$ million) for NIDCR and Two Comparison ICs, 1997–2011



Analysis goal: Document program status

Portfolio subsets:

- NIDCR FY 2014 awards, N=196
 - Data source: QVR
 - Distribution by mechanism and program class code

- NIDCR FY 2011–2013 awards, N=78
 - Data source: NIDCR internal database
 - Distribution by Program Officer



- ▶ Greater activity in SBIR (R43 and R44 mechanisms) was observed than in STTR (R41, R42), greater Phase II than Phase I activity in the STTR projects, and equivalent activity in SBIR phases for the current year.
- ▶ Most of the small business projects were concentrated in one program area, Dental Materials: the percentage of the small business portfolio assigned to the Dental Materials Program Officer was 38, ($11/29 = 38\%$), 38 ($9/24 = 38\%$), and 32 ($8/25 = 32\%$) in FY2011, FY2012, and FY2013, respectively.
- ▶ Of the 196 current small business projects, 78 ($78/196 = 40\%$) were assigned to the Dental and Biomaterials Program Class Codes. Three other program class codes were frequent: 11% for Microbiology and Microbial Pathogenesis, 9% for Tissue Engineering and Dental and Craniofacial Regenerative Medicine, and 9% for Practice Based Research Networks.

Distribution of NIDCR SBIR/STTR Projects by Program Officer (PO), FY 2011-2013

	FY 2011	FY 2012	FY 2013
Number of SBIR/STTR awards	29	24	25
Amount of SBIR/STTR awards	\$ 8,923,850	\$ 9,310,991	\$ 9,029,464
(Number of SBIR/STTR)/ (Number of DER awards)	4.1 %	3.6 %	4.1 %
(Amount of SBIR/STTR awards)/ (Amount of DER awards)	3.3 %	3.4 %	3.6 %
# POs with \geq 1 SB project	9	8	11
Range of # projects per PO	1-11	1-9	1-8
% PO portfolio by count			
range	2.0 % - 23.4 %	1.9 % - 27.3 %	1.3% - 20.0 %
% PO portfolio by dollars			
range	1.3% - 21.7 %	0.8 % - 22.9 %	1.5 % - 19.3 %

Analysis goal: Explore Peer Review

Portfolio Subsets

- NIDCR Awarded Projects, FY 2008–2012
 - Data Source: QVR Summary Statements
 - Impact scores, Criterion scores(Note: Findings are not presented)
- NIDCR SBIR/STTR Applications, FY 2008–2012
 - Data Source: QVR Study Section Rosters
 - Applications scored by Study Section and Mechanism



Most Frequent Study Section Assignments by Mechanism
for NIDCR SBIR/ STTR Applications,
FY 2008-2012

* Panel names such as Oral, Dental, & Craniofacial Sciences, Dental Related & Dentistry Related, Dental Sciences are combined for this row.

Type of Group	Study Section Description	SBIR/STTR Panel Name	R41 (N=88)		R42 (N=32)		R43 (N=402)		R44 (N=179)	
			# apps	%	#	%	#	%	#	%
Special Emphasis	Musculoskeletal, Oral, & Skin Sciences	Oral, Dental, & Craniofacial Sciences *	48	55	28	87	15	38	98	83
	Musculoskeletal, Oral, & Skin Sciences	Oral Biology	5	80	0	-	12	58	4	75
	Musculoskeletal, Oral, & Skin Sciences	Orthopedics & Skeletal Biology	14	57	20	62	34	85	19	74
	Bioengineering Sciences & Technologies		0	-	10	31	43	108	5	80
	Emerging Technologies & Training Neurosciences		1	0	10	31	14	35	8	62
	Infectious Diseases & Microbiology		3	0	0	-	25	62	4	75
	Interdisciplinary Molecular Sciences & Training		2	0	0	-	77	19	2	0
	Oncology – Basic, Translational, & Clinical		8	62	20	62	12	28	11	91
	Surgical Sciences, Biomedical Imaging, & Bioengineering & Medical Imaging		1	0	0	-	92	23	3	33
Standing	Musculoskeletal Tissue Engineering		2	0	0	-	97	24	3	33

Utility & Limitations of the Analysis

- ▶ Utility
 - Multiple research questions
 - Quantitative and qualitative methods
 - Some comparative analyses
 - Recommendations possible
- ▶ Limitations
 - Multiple data sources created for multiple purposes
 - Little explanatory data
 - More contemporary applications have better visualization tools

