

DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

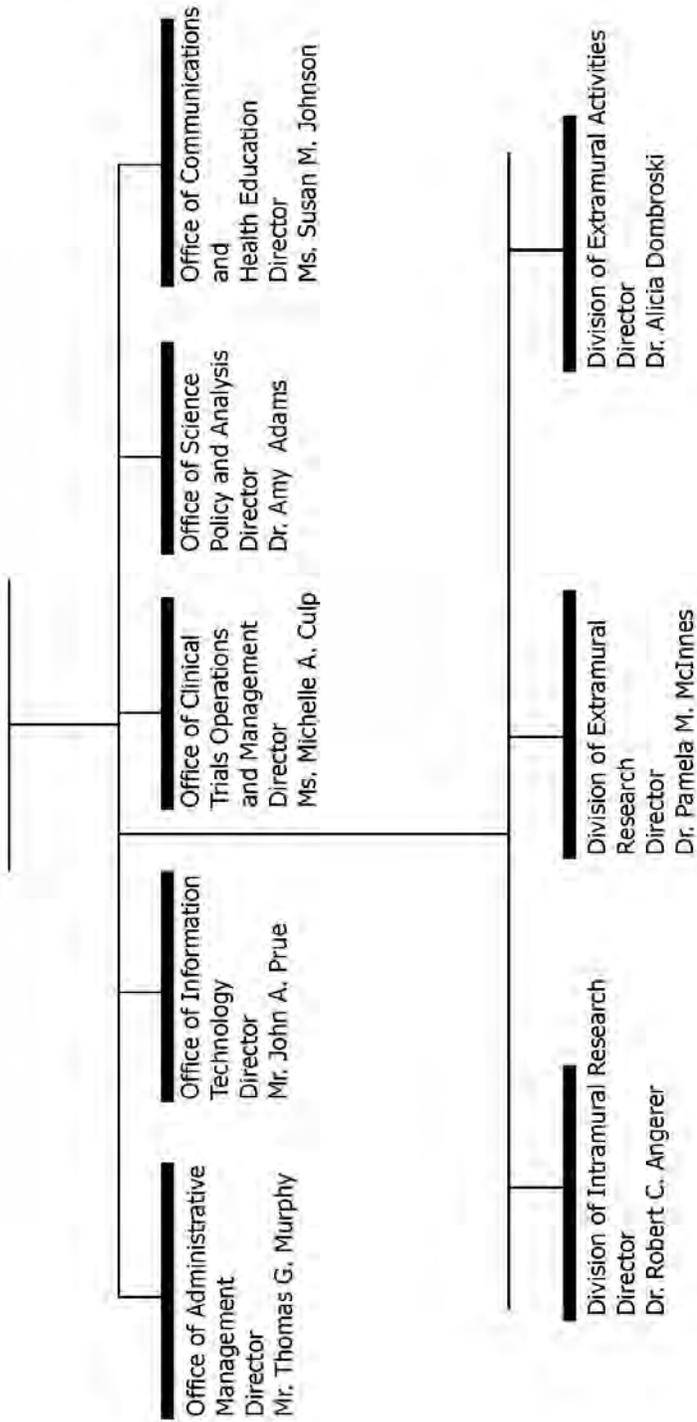
National Institute of Dental and Craniofacial Research (NIDCR)

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# National Institute of Dental and Craniofacial Research

## Office of the Director

Director, Dr. Martha J. Somerman  
Deputy Director, Dr. A. Isabel Garcia  
Associate Director for Management, Mr. Thomas G. Murphy



**National Institutes of Health**

National Institute of Dental and Craniofacial Research

For carrying out section 301 and title IV of the PHS Act with respect to dental *and craniofacial* diseases [\$411,488,000] \$408,212,000. (Department of Health and Human Services Appropriations Act, 2012.)

**NATIONAL INSTITUTES OF HEALTH**  
**National Institute of Dental and Craniofacial Research**

**Amounts Available for Obligation <sup>1</sup>**  
(Dollars in Thousands)

Source of Funding	FY 2011 Actual	FY 2012 Enacted	FY 2013 PB
Appropriation	413,236	411,488	408,212
Type 1 Diabetes	0	0	0
Rescission	(3,628)	(778)	0
Supplemental	0	0	0
Subtotal, adjusted appropriation	409,608	410,710	408,212
Real transfer under Secretary's transfer authority	0	(117)	0
Comparative Transfers for NCATS reorganization	0	0	0
Comparative Transfers to NCATS for Therapeutics and Rare and Neglected Diseases (TRND)	(337)	0	0
Comparative Transfers to NLM for NCBI and Public Access	(351)	(371)	0
Subtotal, adjusted budget authority	408,920	410,222	408,212
Unobligated balance, start of year	0	0	0
Unobligated balance, end of year	0	0	0
Subtotal, adjusted budget authority	408,920	410,222	408,212
Unobligated balance lapsing	(59)	0	0
Total obligations	408,861	410,222	408,212

<sup>1</sup> Excludes the following amounts for reimbursable activities carried out by this account:  
FY 2011 - \$3,529    FY 2012 - \$3,205    FY 2013 - \$2,901

**NATIONAL INSTITUTES OF HEALTH**  
**National Institute of Dental and Craniofacial Research**  
**Budget Mechanism - Total <sup>1/</sup>**  
(Dollars in Thousands)

MECHANISM	FY 2011 Actual		FY 2012 Enacted		FY 2013 PB		Change vs. FY 2012	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Research Grants								
<u>Research Projects</u>								
Noncompeting	451	\$187,337	436	\$175,812	417	\$175,548	(19)	(\$264)
Administrative Supplements	19	5,096	19	5,100	26	7,000	7	1,900
Competing:								
Renewal	28	12,878	28	12,604	36	12,903	8	299
New	146	49,886	143	58,708	138	49,863	(5)	(8,845)
Supplements	2	1,532	2	1,499	4	1,534	2	35
Subtotal, Competing	176	\$64,296	173	\$72,811	178	\$64,300	5	(\$8,511)
Subtotal, RPGs	627	\$256,729	609	\$253,723	595	\$246,848	(14)	(\$6,875)
SBIR/STTR	28	\$8,924	29	\$9,380	30	\$9,650	1	\$270
Research Project Grants	655	\$265,653	638	\$263,103	625	\$256,498	(13)	(\$6,605)
<u>Research Centers</u>								
Specialized/Comprehensive	6	\$14,710	6	\$14,828	4	\$15,802	(2)	\$974
Clinical Research	0	0	0	0	0	0	0	0
Biotechnology	0	0	0	0	0	0	0	0
Comparative Medicine	0	0	0	0	0	0	0	0
Research Centers in Minority Institutions	0	0	0	0	0	0	0	0
Research Centers	6	\$14,710	6	\$14,828	4	\$15,802	(2)	\$974
<u>Other Research</u>								
Research Careers	58	\$7,042	57	\$7,354	57	\$7,350	0	(\$4)
Cancer Education	0	0	0	0	0	0	0	0
Cooperative Clinical Research	0	0	0	0	0	0	0	0
Biomedical Research Support	0	0	0	0	0	0	0	0
Minority Biomedical Research Support	0	0	0	0	0	0	0	0
Other	17	1,295	18	1,221	18	1,220	0	(1)
Other Research	75	\$8,337	75	\$8,575	75	\$8,570	0	(\$5)
Total Research Grants	736	\$288,700	719	\$286,506	704	\$280,870	(15)	(\$5,636)
<u>Research Training</u>								
Individual Awards	84	\$3,325	96	\$3,732	95	\$3,700	(1)	(\$32)
Institutional Awards	210	10,239	188	9,333	185	9,300	(3)	(33)
Total Research Training	294	\$13,564	284	\$13,065	280	\$13,000	(4)	(\$65)
<u>Research &amp; Development Contracts</u>								
<u>SBIR/STTR</u>	15	\$19,245	17	\$21,589	17	\$25,300	0	\$3,711
	0	\$13	0	\$13	0	\$0	0	\$13
<u>Intramural Research</u>								
FTEs	167	\$63,418	167	\$64,632	164	\$64,232	(3)	(\$400)
Research Management and Support	84	23,993	84	24,430	84	24,810	0	380
Construction		0		0		0		0
Buildings and Facilities		0		0		0		0
Total, NIDCR	251	\$408,920	251	\$410,222	248	\$408,212	(3)	(\$2,010)

1/ All items in italics are "non-adds"; items in parenthesis are subtractions.

## **Major Changes in the Fiscal Year 2013 President's Budget Request**

Major changes by budget mechanism and/or budget activity detail are briefly described below. Note that there may be overlap between budget mechanism and activity detail and these highlights will not sum to the total change for the FY 2013 budget request for NIDCR, which is \$2.010 million less than the FY 2012 level, for a total of \$408.212 million.

Research Project Grants (RPGs; -\$6.605 million; total \$256.498 million): NIDCR will fund a projected 178 competing awards in FY 2013, approximately five more than in FY 2012. About 417 noncompeting RPG awards, totaling \$175.548 million also will be made in FY 2013. NIH budget policy for RPGs in FY 2013 discontinues inflationary allowances and reduces the average cost of competing RPGs by one percent below the FY 2012 level and funding for non-competing awards will be one percent less below committed levels.

**NATIONAL INSTITUTES OF HEALTH**  
**National Institute of Dental and Craniofacial Research**  
**Summary of Changes**  
(Dollars in Thousands)

<b>FY 2012 Enacted</b>				<b>\$410,222</b>
<b>FY 2013 President's Budget</b>				<b>\$408,212</b>
<b>Net change</b>				<b>(\$2,010)</b>
<b>CHANGES</b>	<b>2013 President's Budget</b>		<b>Change from FY 2012</b>	
	<b>FTEs</b>	<b>Budget Authority</b>	<b>FTEs</b>	<b>Budget Authority</b>
A. Built-in:				
1. Intramural Research:				
a. Annualization of January				
2012 pay increase & benefits		\$24,329		\$0
b. January FY 2013 pay increase & benefits		24,329		75
c. One more day of pay		24,329		94
d . Annualization of PY net hires		24,329		0
e. Payment for centrally furnished services		10,904		0
f. Increased cost of laboratory supplies, materials, o ther expenses, and non-recurring costs		28,999		0
Subtotal				\$169
2. Research Management and Support:				
a. Annualization of January				
2012 pay increase & benefits		\$12,112		\$1
b. January FY 2013 pay increase & benefits		12,112		37
c. One more day of pay		12,112		45
d . Annualization of PY net hires		12,112		0
e. Payment for centrally furnished services		3,436		0
f. Increased cost of laboratory supplies, materials, o ther expenses, and non-recurring costs		9,262		0
Subtotal				\$84
Subtotal, Built-in				\$253

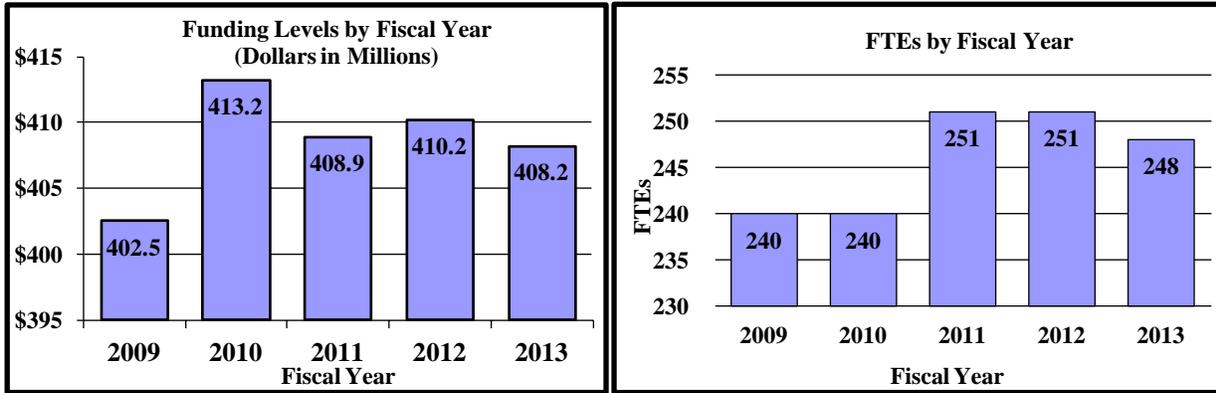
**NATIONAL INSTITUTES OF HEALTH**  
**National Institute of Dental and Craniofacial Research**

**Summary of Changes--continued**

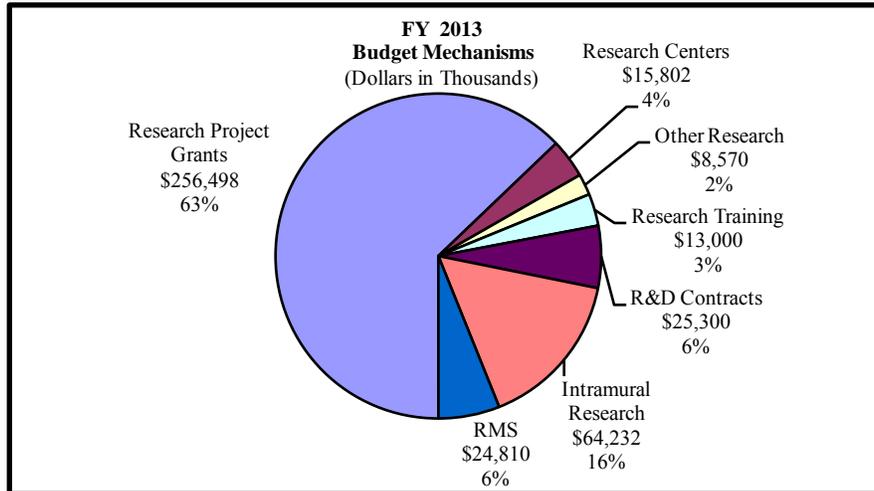
CHANGES	2013 President's Budget		Change from FY 2012	
	No.	Amount	No.	Amount
B. Program:				
1. Research Project Grants:				
a. Noncompeting	417	\$182,548	(19)	\$1,636
b. Competing	178	64,300	5	(8,511)
c. SBIR/STTR	30	9,650	1	270
Total	625	\$256,498	(13)	(\$6,605)
2. Research Centers	4	\$15,802	(2)	\$974
3. Other Research	75	8,570	0	(5)
4. Research Training	280	13,000	(4)	(65)
5. Research and development contracts	17	25,300	0	3,711
Subtotal, Extramural		\$319,170		(\$1,990)
	<u>FTEs</u>		<u>FTEs</u>	
6. Intramural Research	164	\$64,232	(3)	(\$569)
7. Research Management and Support	84	24,810	0	296
8. Construction		0		0
9. Buildings and Facilities		0		0
Subtotal, program	248	\$408,212	(3)	(\$2,263)
Total changes				(\$2,010)

## Fiscal Year 2013 Budget Graphs

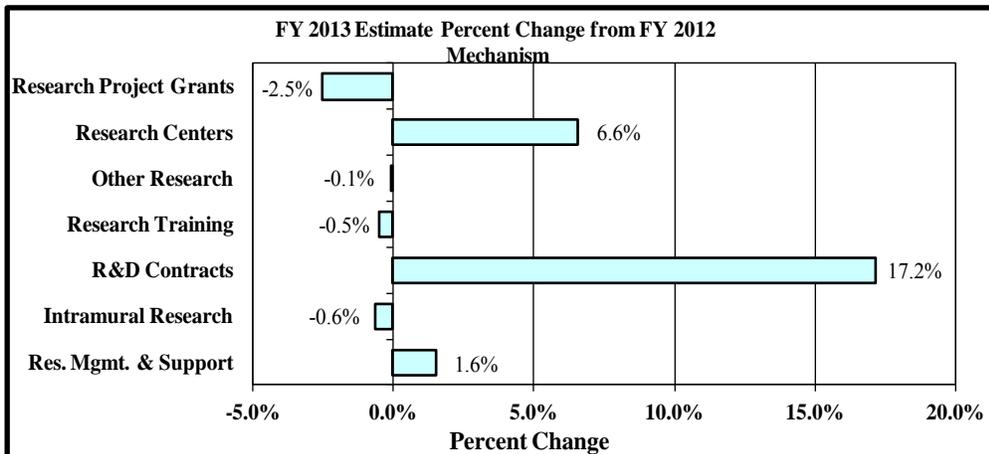
### History of Budget Authority and FTEs



### Distribution by Mechanism:



### Change by Selected Mechanism:



**NATIONAL INSTITUTES OF HEALTH**  
**National Institute of Dental and Craniofacial Research**  
**Budget Authority by Activity**  
(Dollars in Thousands)

	FY 2011 Actual		FY 2012 Enacted		FY 2013 PB		Change vs. FY 2012 Enacted	
	<u>FTEs</u>	<u>Amount</u>	<u>FTEs</u>	<u>Amount</u>	<u>FTEs</u>	<u>Amount</u>	<u>FTEs</u>	<u>Amount</u>
<b><u>Extramural Research</u></b>								
<u>Detail:</u>								
Oral and Craniofacial Biology		\$196,280		195,908		194,694		(1,214)
Clinical Research		\$59,480		61,020		60,642		(378)
Behavioral and Social Sciences		\$16,901		16,058		15,958		(100)
Genetics and Genomics		\$48,848		48,174		47,876		(298)
<b>Subtotal, Extramural</b>		\$321,509		\$321,160		\$319,170		(\$1,990)
<b>Intramural Research</b>	167	\$63,418	167	\$64,632	164	\$64,232	(3)	(\$400)
<b>Research Management &amp; Support</b>	84	\$23,993	84	\$24,430	84	\$24,810	0	\$380
<b>TOTAL</b>	251	\$408,920	251	\$410,222	248	\$408,212	(3)	(\$2,010)

1. Includes FTEs which are reimbursed from the NIH Common Fund.

2. Includes Real Transfers and Comparable Adjustments as detailed in the "Amounts Available for Obligation" table.

**NATIONAL INSTITUTES OF HEALTH  
National Institute of Dental and Craniofacial Research**

**Authorizing Legislation**

	<b>PHS Act/ Other Citation</b>	<b>U.S. Code Citation</b>	<b>2012 Amount Authorized</b>	<b>FY 2012 Enacted</b>	<b>2013 Amount Authorized</b>	<b>FY 2013 PB</b>
Research and Investigation	Section 301	42§241	Indefinite	\$410,222,000	Indefinite	\$408,212,000
National Institute of Dental and Craniofacial Research	Section 401(a)	42§281	Indefinite		Indefinite	
Total, Budget Authority				\$410,222,000		\$408,212,000

**NATIONAL INSTITUTES OF HEALTH**  
**National Institute of Dental and Craniofacial Research**

**Appropriations History**

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation
2004	\$382,396,000	\$382,396,000	\$386,396,000	\$385,796,000
Rescission				(\$2,514,000)
2005	\$394,080,000	\$394,080,000	\$399,200,000	\$395,080,000
Rescission				(\$3,251,000)
2006	\$393,269,000	\$393,269,000	\$405,269,000	\$393,269,000
Rescission				(\$3,933,000)
2007	\$386,095,000	\$386,095,000	\$389,699,000	\$389,703,000
Rescission				\$0
2008	\$389,722,000	\$395,753,000	\$398,602,000	\$396,632,000
Rescission				(\$6,929,000)
Supplemental				\$2,075,000
2009	\$390,535,000	\$403,958,000	\$401,405,000	\$402,652,000
Rescission				\$0
2010	\$408,037,000	\$417,032,000	\$409,241,000	\$413,236,000
Rescission				\$0
2011	\$423,511,000		\$422,845,000	\$413,236,000
Rescission				(\$3,628,459)
2012	\$420,369,000	\$420,369,000	\$404,997,000	\$411,488,000
Rescission				(\$777,712)
2013	\$408,212,000			

## Justification of Budget Request

### *National Institute of Dental and Craniofacial Research*

Authorizing Legislation: Section 301 and title IV of the Public Health Service Act, as amended.

Budget Authority:

	FY 2011 Actual	FY 2012 Enacted	FY 2013 President's Budget	FY 2013 +/ - FY 2012
BA	\$408,920,000	\$410,222,000	\$408,212,000	-\$2,010,000
FTE	251	251	248	-3

Program funds are allocated as follows: Competitive Grants/Cooperative Agreements; Contracts; Direct Federal/Intramural and Other.

### Director's Overview

The nation's dental, oral, and craniofacial health has improved significantly since the 1948 founding of the National Institute of Dental and Craniofacial Research (NIDCR). NIDCR catalyzed major improvements in oral health, and provided the evidence for prevention to become the cornerstone of American dentistry – researchers estimated that from 1979 through 1989 alone, preventive interventions saved the American public over \$39 billion in dental expenditures<sup>1</sup>. However, dental and craniofacial diseases and disorders remain all too common, and more effective science-based strategies are needed to bolster existing prevention approaches, improve diagnostics and risk assessments, and promote personalized care to treat the precise causes of disease and dysfunction.

For the coming fiscal year, the Institute has placed a high priority on three extraordinary research opportunities: oral cancer genomics, human papillomavirus (HPV)-related oropharyngeal cancers, and the genomics of chronic orofacial pain. In FY 2011, NIDCR began a large-scale study to identify the early genetic changes that drive the development of oral cancer. The Oral Cancer Genome Project will move forward in FY 2013 with a second phase to validate and expand on the most promising findings from the initial phase of the study.

Human papillomavirus is associated with a growing subset of oropharyngeal cancers. According to recent surveillance data, the incidence of HPV-related oropharyngeal cancers more than tripled between 1988 and 2004. Yet little is known about the natural history of these tumors; moreover, the potential efficacy of HPV vaccines against oral cancer has not been tested. NIDCR will support research aimed at gaining a clearer perspective on HPV-related oral cancers, including their incidence, risk factors, natural history, and biology — insights that could reveal targets for intervention. NIDCR is pursuing these scientific opportunities aggressively to respond quickly to this pressing health concern.

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<sup>1</sup> Brown, *et al.* Estimated savings in U.S. dental expenditures, 1979-89. *Public Health Reports*. **109**, 195-203 (1994).

NIDCR is dedicated to challenging the paradigm of intractable chronic pain. For too long, the complex, multi-factorial interactions of brain and body, likely influenced by pre-existing conditions, have remained beyond the investigative scope of modern science. In November 2011, NIDCR-supported researchers reported initial results from the first forward-looking study identifying risk factors for developing a chronic orofacial pain condition. To build on this momentum, NIDCR will support research defining the genomics of chronic orofacial pain, with a focus on identifying gene variants that influence pain perception, their environmental triggers, and, importantly, their effect on a pain patient's outlook and behavior.

In FY 2013, NIDCR will continue to apply the best science to understand craniofacial structures and anomalies more completely. Indeed, the human head and face stand out as one of nature's most exquisite feats of engineering, starting in the womb with multiple tissues developing and self-assembling on cue into a seamless, three-dimensional structure of hard and soft tissue. NIDCR supports a team of researchers that is compiling the biological instructions underpinning this extraordinary process into a public resource, <http://www.facebase.org>. When the developmental process goes awry, the results include birth defects such as cleft lip with or without cleft palate (CLP). NIDCR is supporting research to define the genetic and environmental risk factors for CLP, as well as research to optimize care for children with these disorders, including clinical studies to compare the cost and effectiveness of intervention procedures.

NIDCR-funded researchers are also exploring the community of some 600 microbial species that live in the mouth. These microbes appear soon after birth and can influence health in a number of ways. Complementing the NIH Human Microbiome Project, NIDCR supports a number of projects studying how interactions among microbes foster health or disease. A better understanding of these interactions may lead to early intervention and more successful health outcomes.

NIDCR-funded clinical studies cover the spectrum from conditions encountered every day in dental offices to rare disorders that have devastating consequences on oral health. Capitalizing on the success of its currently funded Practice-Based Research Networks (PBRNs), the Institute soon will renew its PBRN initiative with a single national coordinating center and supportive regional nodes. The PBRN initiative enlists practicing dentists to conduct real-world research and advance the evidence base for dental care. On another front, the five NIDCR-supported Centers for Research to Reduce Disparities in Oral Health are conducting their first clinical trials, aimed at developing science-based strategies for helping individuals at greatest risk for oral diseases. Other clinical trials supported by NIDCR are exploring links between oral diseases and systemic conditions such as diabetes. The Institute also funds clinical research that address Sjögren's syndrome, oral and pharyngeal cancers, cleft palate, treatment for intractable pain, and oral manifestations of HIV/AIDS.

Several NIDCR-funded scientists are close to moving their groundbreaking basic science discoveries into clinical care. One example is the effort to validate a point-of-care nanobiochip that scans saliva samples for biomarkers of myocardial infarction, providing a tool that may one day enable Emergency Medical Technicians to assess if a patient being transported by ambulance is having a heart attack. Another example is the development of a new class of

compounds that naturally resolve inflammation and promote healing of inflamed tissue. Preclinical work has begun on one of these compounds, to be followed by studies on safety and efficacy for treating periodontal disease.

To ensure a critical mass of investigators with an intimate knowledge of orofacial structures, NIDCR developed a number of creative programs to encourage more dentists to pursue biomedical research careers. NIDCR created a Pathway to Independence Award specifically for dental scientists, providing them flexibility to incorporate specialty clinical training without derailing their research activities. Another program, the NIDCR Dentist Scientist Career Transition Award, will provide outstanding clinical fellows with research training in NIDCR's intramural laboratories, followed by three years of financial support for their independent research upon transitioning to an extramural institution. The program will be making its first awards in FY 2012.

We live in a remarkable age of scientific discovery. NIDCR will continue to seize the best, most promising opportunities for supporting research that will improve the oral, dental, and craniofacial health of all people.

Overall Budget Policy: The FY 2013 President's Budget request for NIDCR is \$408.2 million, a decrease of \$2.0 million, or 0.49 percent, below the FY 2012 Enacted level. The budget reflects a one percent average cost decrease for competing RPGs, and funding for non-competing RPGs would be one percent below committed levels. In FY 2013, NIH would provide an increase of two percent for stipends levels under the Ruth L. Kirschstein National Research Service Award training program, to continue efforts to attain the stipend levels recommended by the national Academy of Sciences. This would build on the two percent increase in stipend levels for FY 2012. Funds are included in R&D contracts to support NIDCR's share of NIH-wide funding required to support several trans-NIH initiatives, such as the Basic Behavioral and Social Sciences Opportunity Network (OppNet).

## **Program Descriptions and Accomplishments**

### **Oral and Craniofacial Biology:**

The Oral and Craniofacial Biology program supports research on the causes of oral, dental, and craniofacial diseases and disorders, providing the basis for developing new strategies for their prevention, diagnosis, and treatment. The program supports robust basic and translational research in:

- Dental and skeletal biology, repair and regeneration;
- Oral microbiology, infections and immunity;
- Systemic diseases that can affect or be influenced by oral health status;
- Salivary gland biology and pathophysiology;
- Head and neck cancers; and
- Chronic orofacial pain.

### **Program Portrait: Defining the Complexity of Chronic Pain**

FY 2012 Level: \$28.1 million

FY 2013 Level: \$27.9 million

Difference \$0.2 million

Millions of Americans know the acronym well. TMJD is an umbrella term for a group of disorders that affect the area in and around the temporomandibular joint, or TMJ, the complex joint that connects the jaw to the skull on both sides of the head. Common symptoms of TMJ disorders include persistent pain in the jaw muscles, restricted jaw movement, jaw locking, and abnormal popping and clicking of the joint. Although TMJDs vary in duration and severity, for some individuals the pain becomes a permanent, debilitating feature of their lives. Further compounding the difficulty of dealing with a life-long pain disorder, people with TMJD may have other chronic pain disorders, such as irritable bowel syndrome or fibromyalgia. Research is needed to dissect the multi-factorial complexity of TMJD and help identify individuals who are most susceptible to developing chronic disease and might benefit most from early treatment. In addition, understanding the risk factors and mechanisms of TMJD will help scientists and clinicians understand the contribution that genetics plays in influencing sensitivity to other chronic pain conditions.

Researchers affiliated with a large NIDCR-supported study have published preliminary results of the most comprehensive and systematic analysis to date of risk factors associated with chronic TMJD. The goal of the Orofacial Pain: Prospective Evaluation and Risk Assessment (OPPERA) study is to identify specific factors involved in the onset of orofacial pain conditions, providing clinicians more targeted means to diagnose and treat them. OPFERA follows individuals who initially are free of TMJD for three to five years to determine risk factors for the onset of the condition. This is the first time there has been a large-scale prospective study done on TMJD. The initial results from OPFERA provide a substantial body of high-quality data, which confirms many previous discoveries and identifies several new risk factors ranging from demographics to genetics. In the cohort of patients studied, the incidence of chronic TMJD increases with age and does not correlate with socio-economic status, unlike in some other pain conditions. Importantly, TMJD appears to be associated with alterations in some parts of the nervous system that control pain perception, and it is associated with genetic factors, including alterations in genes known to influence stress response, psychological well-being, and inflammation.

The bones in the craniofacial region are distinct from those that comprise the rest of the skeleton in several ways: they are exposed to different forces, they are derived developmentally from different cell types, and they are susceptible to several unique disease conditions. One such condition is osteonecrosis of the jaw (ONJ), a severe bone disease linked to the use of medications that suppress abnormal bone resorption. ONJ potentially can affect a growing number of people who take these drugs to treat osteoporosis or metastatic bone cancer. Data from a growing body of research demonstrate different physiology in bone formation and in maintenance of the jaw bone compared with long bones, which could in part explain why the medication-associated complications have been reported only within jaw bones. NIDCR is supporting additional studies to establish a comprehensive definition of ONJ pathophysiology in support of better prevention and treatment options.

To accelerate the translation of research findings to clinical applications, NIDCR is supporting research that integrates discovery science with advanced tools in stem cell and developmental biology, chemistry, materials science, bioengineering, bioinformatics, and systems biology. Some of the cutting-edge technologies that are facilitating scientific advances include:

- **Nanotechnology**—Results from a recent study showed that novel nanoparticles constructed from white blood cell components coupled with anti-inflammatory small molecules protect against inflammation of the temporomandibular joint (TMJ), thus paving the way for preclinical testing of this approach to treat TMJ disorders;

- **Molecular diagnostics**—Researchers have developed several important salivary biomarkers that now are ready for validation studies. Identification and clinical validation of salivary diagnostic biomarkers, and the development of related assays and platform technologies will lead to rapid, point-of-care, non-invasive diagnosis of many conditions, including oral cancer, Sjögren’s Syndrome, and heart attack. Following clinical validation, both the biomarkers and the related diagnostic device will be well positioned to undergo product development. This salivary diagnostic device also can analyze other biofluids and can be adapted for the diagnosis of other diseases and conditions.
- **Materials science**—Defining the relationship between increased secondary dental decay and resin composite restorations is a critical area of focus in light of the enhanced use of dental composites, and their shorter service life as compared to traditional fillings. This information is of vital importance to improving restorative materials, minimizing repeated treatment and cost, and informing successful early interventions in diverse populations.

Budget Policy: The FY 2013 President’s Budget request for this program is \$194.694 million, a decrease of \$1.214 million or 0.62 percent compared to the FY 2012 Enacted level. Greatest priority will be given to highly meritorious new research and ongoing initiatives.

Increasing research capacity and introducing new expertise is an ongoing priority for research on orofacial pain, including TMJ disorders. Under an initiative that began in FY 2012, NIDCR will continue to fund scientists with proven mentoring skills to establish new career development programs that are focused on building a sustainable, vibrant TMJD research community.

The NIDCR also will invest in a new initiative on the genomics of chronic orofacial pain. Chronic orofacial pain can be debilitating and often co-occurs with other chronic pain disorders, yet the underlying processes that lead to chronic pain are complex and poorly understood. The NIDCR will support research into the molecular underpinnings of chronic orofacial pain in an effort to drive better informed prevention, diagnosis, and treatment of pain disorders.

The Institute will support an SBIR/STTR initiative that accelerates the advanced development and clinical implementation of reliable, reproducible, highly specific, and sensitive dental diagnostic instruments. High priorities areas include early detection of dental caries, periodontal diseases, cracked teeth, and pulp vitality. Early detection of dental diseases allows dentists to monitor potential problems and use minimally invasive procedures to treat and prevent progression of conditions that would cause greater damage if left untreated.

The NIDCR also supports a robust portfolio of research on dental restorative materials. There is a substantial public health need for safer and longer lasting, more effective fillings, implants and sealants. Emerging opportunities in novel dental composite materials and biomaterials utilizing advanced chemistry will be explored for restoring missing tooth structures. Additional areas of interest include evaluation and enhancement of the tooth-adhesive-dental material interface, new resin development, restorative materials’ lifespan estimations, and the effect of oral biofilm formation on dental materials and implants.

**Clinical Research:** NIDCR continues its efforts to catalyze dentistry's transition to an evidence-based future. The Institute supports multi-center Phase III clinical trials and two important research initiatives that are strengthening dentistry's evidence base. They are the Dental Practice Based Research Networks (PBRNs) and the Centers for Research to Reduce Disparities in Oral Health.

The PBRNs were established in 2005 to provide scientific evidence to guide dentists in their everyday treatment choices. To date, nearly 1,000 practitioner-investigators have participated in network projects, and over 30,000 patients from their practices have been enrolled in more than 30 different PBRN studies. These studies include comparisons of the benefits of a variety of dental procedures, dental materials, and diagnostic strategies for patients with diverse clinical conditions. Individual studies have addressed, for example, controlling pain associated with root canal therapy, improving dental restorations, and testing the feasibility of measuring blood glucose levels in dental practice. Another example of an important dental PBRN study is a large case-control study that established risk factors associated with osteonecrosis of the jaw. This study will help dental clinicians advise their patients who take oral bisphosphonates about possible complications following procedures such as dental implant placement and tooth extractions.

The Health Disparities Research Program supports studies that seek practical, sustainable approaches to improve the oral health of diverse populations. Recognizing that the benefits of oral health prevention and treatment have not reached all Americans, the Institute created the program to support research on how to disseminate and implement effective oral health care into all communities. NIDCR funds five centers that are conducting seven clinical trials aimed at reducing early childhood caries, improving the oral health of disadvantaged pregnant women, and increasing early detection of oral cancer.

In addition, NIDCR continues to support the Oral HIV/AIDS Research Alliance, a collaborative science group conducting nine clinical studies designed to address oral complications associated with HIV/AIDS, particularly the effects of antiretroviral therapy on the development of oral mucosal lesions, oral cancer, and viral and fungal infections. Recently, NIDCR launched an observational study, embedded within the Eunice Kennedy Shriver National Institute on Child Health and Human Development-supported Pediatrics HIV/AIDS Cohort Study, to assess and compare the oral health status of HIV-infected and uninfected children in the United States. The study will also determine the association between oral health outcomes and indicators of overall health among HIV-infected children. Unfortunately, children with HIV must take medications that greatly increase their risk for severe dental caries. This research will enable clinicians to develop appropriate treatment plans with realistic dental approaches for young HIV patients.

Budget Policy: The FY 2013 President's Budget request for this program is \$60.642 million, a decrease of \$0.378 million or 0.62 percent compared to the FY 2012 Enacted level. High priority will be given to support meritorious new research projects, ongoing initiatives, and continuation of a 2012 initiative to sustain the research capacity of the PBRNs.

PBRN research has the potential to accelerate the translation of research findings into clinical practice and thereby change the way dentistry is practiced in the United States. The NIDCR plans to establish a National Dental Practice-Based Research Network (NDPBRN) during 2012 with broader representation of both patient populations and types of clinical practices than currently exists with the three regional dental PBRNs. Ultimately, research conducted in NDPBRN settings should provide useful evidence for improvements in all aspects of patient care, including routine clinical visits.

Another new initiative will address the epidemiology and pathological basis of the onset and progression of Human Papillomavirus (HPV)-related oropharyngeal cancer (OPC). The alarming increase in HPV-related OPCs over the past two decades demands active research aimed at mitigating risk factors for oral HPV infection, persistence, and transmission, early detection of HPV-related OPC, and developing mechanism-based therapies that will contribute to improved prevention and clinical outcomes of HPV-related OPC.

**Behavioral and Social Sciences Research:** NIDCR recognizes that many opportunities for improving oral health lie in achieving behavioral changes. This program supports basic research to understand both the mechanisms of behavior change and the influence of behavioral and social factors on oral health. Clinical research aims to develop efficacious and sustainable interventions that target relevant behavioral and social factors. One area of particular interest for behavioral research is early intervention for the prevention of childhood caries. NIDCR-supported research has shown that for low-income Medicaid children, having their first preventive dental visit by age one is correlated with fewer subsequent restorative or emergency room visits, resulting in almost 40 percent lower average dentally-related costs over a five-year period – a potential average savings of \$184 per child per year<sup>2</sup>. Recommendations from a 2009 expert meeting led the program to develop new tools to support rigorous behavioral and social intervention research. A second meeting of experts in 2011 resulted in recommendations for more emphasis on studying how and why behavioral and social factors affect oral health. In response, NIDCR is examining ways to equip investigators with the expertise to conduct high caliber, thorough research in this area; the approaches include intensive workshops, online problem-based learning modules, and expert consultations. As a result of workshop recommendations, NIDCR also launched a funding opportunity to support the development of manuals and protocols, which will facilitate robust research programs in social and behavioral science.

Budget Policy: The FY 2013 President’s Budget request for this program is \$15.958 million, a decrease of \$0.100 million or 0.62 percent compared to the FY 2012 Enacted level. Priority will be given to support highly meritorious new research projects and ongoing initiatives, especially those that contribute to an understanding of behavioral and social mechanisms required for advancing oral health.

Understanding the behavioral and social determinants of oral health has several important consequences including: 1) efficient development of behavioral and social interventions by drawing on a comprehensive (rather than silo) science of behavior change; 2) efficient targeting

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<sup>2</sup> Savage, *et al.* Early Preventive Dental Visits: Effects on Subsequent Utilization and Costs. *Pediatrics*. **114**, e418-e423 (2004).

of behavioral and social interventions to improve oral health for a range of under-served populations; and 3) dissemination of interventions that can be sustained in the community settings for which they are intended.

**Translational Genetics and Genomics:** This program places a strong emphasis on integrative research; comparative studies across species; and comprehensive analytic studies of genomics, gene activity, and protein profiles to provide insights into the mechanisms of craniofacial development, craniofacial and dental disorders, and oral health in children and adults. The program's ultimate goal is to translate the most promising genomic and developmental findings into clinical studies that will yield improved preventive measures, diagnostic tests, prenatal care, and treatments to minimize the damage from dental and craniofacial conditions and disorders and maximize oral health.

The FaceBase Consortium, funded in 2009, continues to make significant progress toward its goal of creating a freely available database compiling the biological and genetic instructions to construct the middle region of the human face. FaceBase will facilitate data production and integration, as well as accelerate translational and clinical application of this knowledge for the prevention, treatment, and management of craniofacial birth defects. FaceBase's individual scientific projects continue to provide data to the FaceBase data integration and management hub; the hub's informatics development team is creating new interfaces for displaying and searching those data on the consortium's website (<http://www.facebase.org>). The website continues to draw new users from the scientific community.

Genome-wide association studies (GWAS) of cleft lip and/or cleft palate and of dental caries continue to provide important new leads about the role genetic factors and gene-environment interactions play in the development of these conditions. For example, the cleft lip and/or palate study identified areas of the genome that were associated with increased risk of isolated cleft palate when the mother used alcohol just before or early in pregnancy or smoked cigarettes, and decreased risk when the mother took multivitamin supplements during pregnancy. A DNA sequencing study is under way to identify less-common genetic variants that influence the risk of developing cleft lip and/or cleft palate. The dental caries GWAS identified promising areas of the genome for susceptibility to childhood dental caries, including evidence that different genetic factors may be important depending on home fluoride exposure levels.

The initial phase of the Oral Cancer Genome Project yielded important discoveries about genomic changes that occur in cells during the development of oral and pharyngeal cancer. The results suggest that the reclassification of these tumors based on their molecular characteristics is starting to come within technological reach as a key first step in establishing personalized medicine. The program also supports research in areas critical to diverse patient groups, such as Sjögren's Syndrome and periodontal disease. To maximize discoveries in projects with genome-wide data, small grants for improving statistical methods and secondary analysis are supported under a Program Announcement released in FY 2010. NIDCR investments are catalyzing tremendous progress in understanding the role of genetic variation in a wide range of conditions such as craniosynostosis (premature closing of joints between bones in the skull) using more targeted genotyping, DNA sequencing, gene expression studies in tissues, and animal models of

human conditions. These investments are laying the groundwork for translation of compelling clinical leads into improved, individually tailored care.

**Program Portrait: Genomics of Oral Cancer**

FY 2012 Level: \$3.3 million

FY 2013 Level: \$3.3 million

Difference \$0.0 million

Although personalized healthcare remains a conceptual work in progress, its foundations are starting to solidify. A prime example of the shift toward individualized treatment involves cancers of the oral cavity and pharynx, the seventh most common set of cancers among U. S. males and fifth among African American males. Because there is frequently no pain with oral cancers at early stages, they can go undetected. Late diagnosis contributes to survival rates that are among the lowest of major cancers, especially among minorities. The five-year survival rate for individuals with head and neck squamous cell carcinoma (HNSCC), the most common form of oral cancer, has improved only marginally over the past 40 years, and difficulties remain in early detection of the disease and in effective therapy. In FY 2009, NIDCR strategically invested a portion of its American Recovery and Reinvestment Act funds to establish the Oral Cancer Genome Project (OCGP). This collaborative research project has begun to define the early genetic changes that drive the development of these tumors. As part of the OCGP's initial discovery phase, next-generation sequencing technology yielded one of the most comprehensive analyses of the genetic landscape that underlies HNSCC. The data clarify that HNSCC is caused by dozens of distinct molecular pathways, each driven by a unique acquired pattern of cancer-causing gene alterations.

This research also confirmed that tumors associated with human papilloma virus infection had a different genetic profile than tumors in individuals with a history of tobacco use. These findings provide new research targets that may yield breakthrough discoveries leading to improved diagnosis and therapies. One surprising result was that the gene NOTCH1 frequently is altered in HNSCC. Faulty NOTCH1 is known to be involved in tumor formation in many types of cancer, including squamous cell carcinoma of the skin, but it had not been implicated previously in HNSCC. Because NOTCH1 has a role in many tumor types, a better understanding of its role in HNSCC may provide insight for the treatment of a range of cancers. Many of the results of the discovery-phase study were corroborated by a companion study, also supported by NIH. These results lay the groundwork for exciting new investigations into the role these newly-implicated pathways might play in disease initiation and progression. Extension of sequencing studies to other oral cancer subtypes and further functional studies in the upcoming validation phase of the Oral Cancer Genome Project will help researchers understand the role of other gene alterations identified in the discovery phase. The validation phase will be launched in 2013; this next step should go far towards helping to reclassify these tumors based on their molecular characteristics, a key first step in establishing personalized treatment. Furthermore, these results will help guide early detection and careful surveillance of individuals at risk to reduce morbidity and mortality from this disease.

As a complement to the human genetic studies, NIDCR supports the Human Oral Microbiome Database (HOMD), the first comprehensive database of the oral microbiome. Integrating information about human (or host) genetic variation and the oral microbiome will improve our understanding of common oral diseases such as dental caries and periodontal disease. Progress also is being made in the development of new technologies to cultivate previously uncultivable organisms, enabling scientists for the first time to study these microorganisms in isolation in the lab. By supporting research on the metabolic, genetic, structural, and host defense interactions of oral microbes within the complex biofilm (dental plaque) and in states of health and disease, we will translate our understanding of microbial interactions to provide new therapeutic targets and enhance prevention and treatment strategies.

Budget Policy: The FY 2013 President's Budget request for this program is \$47.876 million, a decrease of \$0.298 million or 0.62 percent compared to FY 2012 Enacted level. Priority will be given to support highly meritorious new research projects and ongoing initiatives.

NIDCR will continue to leverage existing resources and prioritize support for genetics and genomics research. An ongoing Program Announcement (PA) will continue to promote research in these key areas for dental, oral, and craniofacial diseases and disorders that have evidence of heritability but for which we do not have a strong understanding of the genetics/genomics of the disease or disorder. This PA will provide support for projects including genome-wide association studies (GWAS), DNA sequencing, and functional studies.

A planned FY 2013 initiative will encourage the broader craniofacial research community to utilize FaceBase resources and foster new projects. The initial FaceBase initiative attracted a talented group of investigators, all of whom are contributing their data to the publically available FaceBase resource. These diverse projects are producing large datasets that can be productively analyzed further by researchers outside of the consortium. This new initiative will support secondary analyses of existing datasets in order to attract new researchers, develop systems-wide understanding of craniofacial disorders, and to maximize the return on NIDCR's investment in FaceBase.

To realize the full potential of the initial discovery phase of the Oral Cancer Genome Project (OCGP), validation with additional tumor samples is necessary. A new initiative will support this essential second phase. Plans include an extension of current data sets to improve statistical validity and strength; expansion of genomic analyses to a more racially and ethnically diverse study population; and correlation of genetic alterations with changes in gene expression, and functional analyses. The OCGP's validation phase is expected to lead the way to rational drug development, effective cancer therapy, and molecular epidemiology-driven cancer prevention strategies in the future.

**Intramural Research:** The Intramural Research Program (IRP) conducts innovative research on many aspects of oral and craniofacial health. Areas of strong research focus include the biochemistry, development, and function of teeth, bone, salivary glands, and surrounding connective tissues; immunology of the mucosal system; the role of bacteria and viruses in oral disease; the cellular and molecular basis of pain and taste; and the development of improved methods to diagnose and treat disease. Building on identification of the cellular enzyme Cdk5 as a key molecule in inflammation-associated pain, a high-throughput screen will be carried out to identify small molecule inhibitors that may be developed as a new class of analgesics. In other work, investigators made a detailed comparison of cell interactions with different surrounding matrices in three dimensions or on flat surfaces, identifying differences in cell attachments and internal cytoskeletal structure that will be important in future tissue engineering efforts. In a major initiative, intramural investigators have collaborated on basic, translational, and clinical studies to understand the development, function, and dysfunction of oral soft tissues, including the tongue, mucosa, and salivary glands.

In 2011, NIDCR investigators completed enrollment in a first-in-humans gene therapy clinical trial seeking to restore salivary gland function in cancer patients. NIDCR plans to launch a follow-up study with an improved viral delivery system capable of sustaining longer-term

expression. Underpinning these clinical efforts is a broad range of basic studies to understand features of salivary gland development and adult gland function that may lead to improved diagnosis and treatment. The combined results of this sustained investment in unraveling salivary function provide a promising line of research to pursue as a possible therapy for Sjögren's Syndrome patients.

**Program Portrait: New Technology, New Hope for Diagnosing Sjögren's Syndrome**

FY 2012 Level: \$16.3 million

FY 2013 Level: \$16.2 million

Difference \$0.1 million

Every year, thousands of Americans are evaluated for the autoimmune disorder primary Sjögren's Syndrome (SS). Their healthcare providers will likely test them for antibodies, including two associated with the condition. But diagnosis can be elusive. Today's standard blood tests detect SSB—the antibody more strongly associated with SS—only about half the time, resulting in excessive false negatives. Other tests for SS require extensive evaluations by specialists, which are time consuming and expensive. This disease afflicts a total of approximately four million Americans, 90 percent of them women. In SS, white blood cells attack the body's own salivary and tear glands, decreasing production of saliva and tears and causing significant oral and ocular disease and discomfort. Early diagnosis and treatment are important for preventing complications. Unfortunately, symptoms can mimic many other diseases, and reaching a diagnosis can take months or even years. The lingering uncertainty resulting from imperfect diagnostic tests has created a pressing need for basic research discoveries focused toward improving or complementing existing diagnostic tests for primary SS.

Recently, a team of NIDCR intramural scientists and colleagues developed a promising alternative approach for diagnosis using high-throughput methods including sophisticated and relatively low-cost next-generation DNA sequencing. The researchers used this advanced technology to generate, for the first time, comprehensive RNA profiles from the salivary glands of healthy volunteers and from individuals diagnosed with primary SS. Comparing these profiles, the scientists identified 58 microRNAs—small molecules that can control gene expression—that were produced in different amounts between the two groups, indicating possible inflammatory activities associated with SS. Subsequently, they developed predictive computer algorithms that correctly distinguished between microRNA profiles of healthy volunteers and Sjögren's patients.

In addition to the identification of novel microRNAs, scientists found a microRNA known to play a role in regulating immune cells within the salivary gland, suggesting that a mechanistic breakdown in T cell regulation may underlie the SS's autoimmune symptoms that present themselves in the salivary glands. These discoveries may have significant implications for diagnosis and could suggest new therapeutic approaches. Research is under way to validate these findings in a larger group of individuals, for eventual clinical application.

The progress achieved by intramural scientists is complemented by NIDCR-supported extramural research on Sjögren's Syndrome. NIDCR-supported scientists are working to validate salivary diagnostic biomarkers and to develop the related testing apparatus for SS. Sjögren's Syndrome is also the focus of a genome-wide study to identify genetic factors that contribute to the disorder

Budget Policy: The FY 2013 President's Budget request for this program is \$64.23 million, a decrease of \$0.40 million or 0.62 percent compared to the FY 2012 Enacted level. Funds will allow continued support for high priority ongoing research.

A high-priority area within the intramural program is the development of treatments for oral mucositis. Oral mucositis is a common side effect suffered by many of the 40,000 individuals each year who undergo chemoradiation treatment for head and neck cancer. The NIDCR will

initiate clinical studies in 2013 exploring the efficacy of low-level-laser therapy (LLLT) in promoting healing of the oral mucosa in patients undergoing cancer therapy. These clinical studies will be coupled with laboratory analyses of the mechanism of action of LLLT.

In an alternative approach to repairing damaged salivary glands, intramural scientists will build on recent studies that identified and characterized transient amplifying (stem) cells in embryonic salivary glands of mice, showing that their maintenance requires input from associated nerves. The goal is to identify similar stem cells in adult animals and biopsy samples from normal and damaged human salivary glands. Thereafter, these cells will be studied as potential agents in replacement therapy.

Developing and maintaining a robust workforce of clinical and basic scientists is a high priority for the intramural program. In 2011, NIDCR began accepting applications for at Dentist Scientist Career Transition Award for Intramural Investigators, which funds mentored research at NIH and subsequent independent research outside of NIH for highly-qualified dentists in intramural fellowship positions; NIDCR will continue this program in 2012 and 2013.

**Research Management and Support (RMS):** The RMS mechanism supports the scientific and administrative management structures needed to lead and manage the world's largest oral health research enterprise effectively. The Institute's extramural staff scientists and grant specialists maintain liaison with nearly 800 grantees, and provide stewardship for the Institute's investment in research and research training grants. Additionally, NIDCR conducts formal evaluations of its intramural and extramural research programs to inform leadership and advisory bodies on scientific progress and new research directions. This budget category also supports the Institute's Office of Communications and Health Education, which produces and disseminates informational materials on a wide variety of topics, ranging from children's oral health, oral cancer, and periodontal disease, to oral health care for people with disabilities. Some materials are geared toward patients or the general public; others are targeted to health care professionals, teachers, or caregivers for special needs patients. The Office also disseminates information about significant research advances to the media, patient support organizations, professional organizations, and the research community.

Budget Policy: The FY 2013 President's Budget request for this program is \$24.81 million, an increase of \$0.38 million or 1.56 percent compared to the FY 2012 Enacted level. Funds will support the evaluation of selected research and research management activities, and continuation of other critical management and oversight activities.

**NATIONAL INSTITUTES OF HEALTH**  
**National Institute of Dental and Craniofacial Research**

**Budget Authority by Object**  
(Dollars in Thousands)

	<b>FY 2012 Enacted</b>	<b>FY 2013 PB</b>	<b>Increase or Decrease</b>
Total compensable workyears:			
Full-time employment	251	248	(3)
Full-time equivalent of overtime and holiday hours	0	0	0
Average ES salary ( <i>in dollars</i> )	\$159,069	\$159,673	\$604
Average GM/GS grade	11.4	11.3	(0.1)
Average GM/GS salary ( <i>in dollars</i> )	\$90,774	\$90,500	(\$274)
Average salary, grade established by act of July 1, 1944 (42 U.S.C. 207) ( <i>in dollars</i> )	\$107,592	\$109,636	\$2,044
Average salary of ungraded positions ( <i>in dollars</i> )	125,358	125,834	476
<b>OBJECT CLASSES</b>	<b>FY 2012 Enacted</b>	<b>FY 2013 PB</b>	<b>Increase or Decrease</b>
Personnel Compensation:			
11.1 Full-time permanent	\$13,537	\$13,623	\$86
11.3 Other than full-time permanent	10,556	10,533	(23)
11.5 Other personnel compensation	707	711	4
11.7 Military personnel	369	385	16
11.8 Special personnel services payments	3,626	3,602	(24)
<b>Total, Personnel Compensation</b>	<b>\$28,795</b>	<b>\$28,854</b>	<b>\$59</b>
12.0 Personnel benefits	\$7,375	\$7,395	\$20
12.2 Military personnel benefits	187	192	5
13.0 Benefits for former personnel	0	0	0
<b>Subtotal, Pay Costs</b>	<b>\$36,357</b>	<b>\$36,441</b>	<b>\$84</b>
21.0 Travel and transportation of persons	\$902	\$884	(\$18)
22.0 Transportation of things	156	153	(3)
23.1 Rental payments to GSA	0	0	0
23.2 Rental payments to others	0	0	0
23.3 Communications, utilities and miscellaneous charges	452	435	(17)
24.0 Printing and reproduction	240	227	(13)
25.1 Consulting services	2,104	2,310	206
25.2 Other services	4,078	4,279	201
25.3 Purchase of goods and services from government accounts	49,696	52,635	2,939
25.4 Operation and maintenance of facilities	120	120	0
25.5 Research and development contracts	6,924	7,251	327
25.6 Medical care	202	202	0
25.7 Operation and maintenance of equipment	1,133	1,133	0
25.8 Subsistence and support of persons	0	0	0
<b>25.0 Subtotal, Other Contractual Services</b>	<b>\$64,257</b>	<b>\$67,930</b>	<b>\$3,673</b>
26.0 Supplies and materials	\$5,457	\$5,451	(\$6)
31.0 Equipment	2,830	2,821	(9)
32.0 Land and structures	0	0	0
33.0 Investments and loans	0	0	0
41.0 Grants, subsidies and contributions	299,571	293,870	(5,701)
42.0 Insurance claims and indemnities	0	0	0
43.0 Interest and dividends	0	0	0
44.0 Refunds	0	0	0
<b>Subtotal, Non-Pay Costs</b>	<b>\$373,865</b>	<b>\$371,771</b>	<b>(\$2,094)</b>
<b>Total Budget Authority by Object</b>	<b>\$410,222</b>	<b>\$408,212</b>	<b>(\$2,010)</b>

Includes FTEs which are reimbursed from the NIH Common Fund.

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**Salaries and Expenses**  
**(Dollars in Thousands)**

<b>OBJECT CLASSES</b>	<b>FY 2012 Enacted</b>	<b>FY 2013 PB</b>	<b>Increase or Decrease</b>
<b>Personnel Compensation:</b>			
Full-time permanent (11.1)	\$13,537	\$13,623	\$86
Other than full-time permanent (11.3)	10,556	10,533	(23)
Other personnel compensation (11.5)	707	711	4
Military personnel (11.7)	369	385	16
Special personnel services payments (11.8)	3,626	3,602	(24)
<b>Total Personnel Compensation (11.9)</b>	<b>\$28,795</b>	<b>\$28,854</b>	<b>\$59</b>
Civilian personnel benefits (12.1)	\$7,375	\$7,395	\$20
Military personnel benefits (12.2)	187	192	5
Benefits to former personnel (13.0)	0	0	0
<b>Subtotal, Pay Costs</b>	<b>\$36,357</b>	<b>\$36,357</b>	<b>\$84</b>
Travel (21.0)	\$902	\$884	(\$18)
Transportation of things (22.0)	156	153	(3)
Rental payments to others (23.2)	0	0	0
Communications, utilities and miscellaneous charges (23.3)	452	435	(17)
Printing and reproduction (24.0)	240	227	(13)
<b>Other Contractual Services:</b>			
Advisory and assistance services (25.1)	2,104	2,310	206
Other services (25.2)	4,078	4,279	201
Purchases from government accounts (25.3)	37,710	37,500	(210)
Operation and maintenance of facilities (25.4)	120	120	0
Operation and maintenance of equipment (25.7)	1,133	1,133	0
Subsistence and support of persons (25.8)	0	0	0
<b>Subtotal Other Contractual Services</b>	<b>\$45,145</b>	<b>\$45,342</b>	<b>\$197</b>
Supplies and materials (26.0)	\$5,439	\$5,433	(\$6)
<b>Subtotal, Non-Pay Costs</b>	<b>\$52,334</b>	<b>\$52,474</b>	<b>\$140</b>
<b>Total, Administrative Costs</b>	<b>\$88,691</b>	<b>\$88,915</b>	<b>\$224</b>

NATIONAL INSTITUTES OF HEALTH  
National Institute of Dental and Craniofacial Research

Details of Full-Time Equivalent Employment (FTEs)

OFFICE/DIVISION	FY 2011 Actual			FY 2012 Enacted			FY 2013 PB		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Office of the Director									
Direct:	4	1	5	5	1	6	5	1	6
Reimbursable:	0	0	0	0	0	0	0	0	0
T otal:	4	1	5	5	1	6	5	1	6
Office of Administrative Management									
Direct:	14	0	14	14	0	14	14	0	14
Reimbursable:	0	0	0	0	0	0	0	0	0
T otal:	14	0	14	14	0	14	14	0	14
Office of Information Technology									
Direct:	7	0	7	7	0	7	7	0	7
Reimbursable:	0	0	0	0	0	0	0	0	0
T otal:	7	0	7	7	0	7	7	0	7
Office of Science Policy and Analysis									
Direct:	9	0	9	9	0	9	9	0	9
Reimbursable:	0	0	0	0	0	0	0	0	0
T otal:	9	0	9	9	0	9	9	0	9
Office of Communications and Health Education									
Direct:	6	0	6	6	0	6	6	0	6
Reimbursable:	0	0	0	0	0	0	0	0	0
T otal:	6	0	6	6	0	6	6	0	6
Division of Intramural Research									
Direct:	160	1	161	160	1	161	157	1	158
Reimbursable:	6	0	6	6	0	6	6	0	6
T otal:	166	1	167	166	1	167	163	1	164
Division of Extramural Activities									
Direct:	18	1	19	18	0	18	18	0	18
Reimbursable:	0	0	0	0	0	0	0	0	0
T otal:	18	1	19	18	0	18	18	0	18
Division of Extramural Research									
Direct:	21	0	21	22	0	22	24	0	24
Reimbursable:	3	0	3	2	0	2	0	0	0
T otal:	24	0	24	24	0	24	24	0	24
<b>T otal</b>	<b>248</b>	<b>3</b>	<b>251</b>	<b>249</b>	<b>2</b>	<b>251</b>	<b>246</b>	<b>2</b>	<b>248</b>
Includes FTEs which are reimbursed from the NIH Common Fund.									
FTEs supported by funds from Cooperative Research and Development Agreements	0	0	0	0	0	0	0	0	0
<b>FISCAL YEAR</b>	<b>Average GS Grade</b>								
2009	11.3								
2010	11.4								
2011	11.4								
2012	11.4								
2013	11.3								

**NATIONAL INSTITUTES OF HEALTH**  
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**Detail of Positions**

<b>GRADE</b>	<b>FY 2011 Actual</b>	<b>FY 2012 Enacted</b>	<b>FY 2013 PB</b>
Total, ES Positions	1	1	1
Total, ES Salary	159,069	159,069	159,673
GM/GS-15	16	16	16
GM/GS-14	30	30	29
GM/GS-13	21	21	20
GS-12	35	35	34
GS-11	18	18	18
GS-10	1	1	1
GS-9	16	16	16
GS-8	9	9	9
GS-7	8	8	8
GS-6	9	9	9
GS-5	3	3	3
GS-4	0	0	0
GS-3	0	0	0
GS-2	2	2	2
GS-1	0	0	0
Subtotal	168	168	165
Grades established by Act of July 1, 1944 (42 U.S.C. 207):			
Assistant Surgeon General	1	1	1
Director Grade	1	0	0
Senior Grade	0	0	0
Full Grade	1	1	1
Senior Assistant Grade	0	0	0
Assistant Grade	0	0	0
Subtotal	3	2	2
Ungraded	88	88	87
Total permanent positions	166	166	162
Total positions, end of year	274	274	272
Total full-time equivalent (FTE) employment, end of year	251	251	248
Average ES salary	159,069	159,069	159,673
Average GM/GS grade	11.4	11.4	11.3
Average GM/GS salary	90,774	90,774	90,500

Includes FTEs which are reimbursed from the NIH Common Fund.