

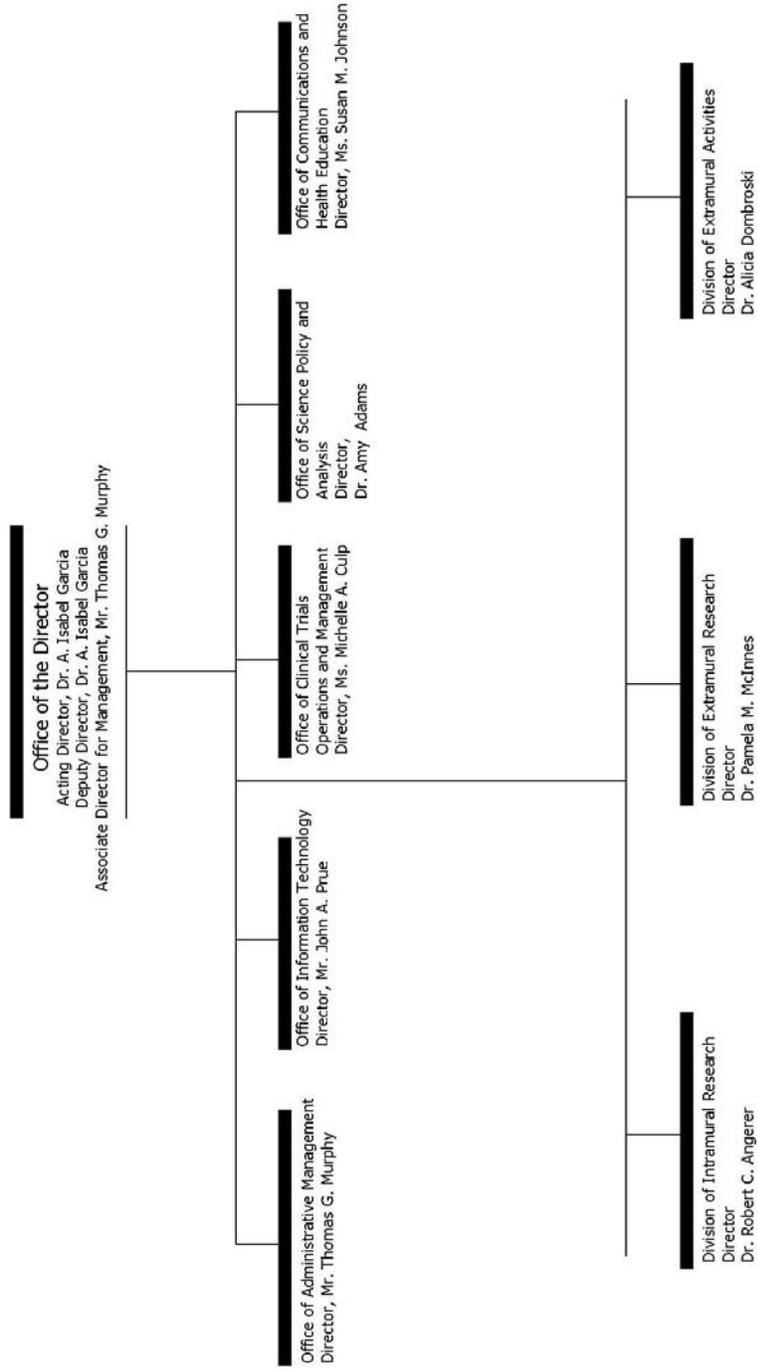
DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

National Institute of Dental and Craniofacial Research

|   |          |
|---|----------|
| FY 2012 Budget.....                                   | Page No. |
| Organization Chart.....                               | 2        |
| Appropriation Language .....                          | 3        |
| Amounts Available for Obligation.....                 | 4        |
| Budget Mechanism Table .....                          | 5        |
| Major Changes in Budget Request .....                 | 6        |
| Summary of Changes .....                              | 7        |
| Budget Graphs .....                                   | 9        |
| Budget Authority by Activity .....                    | 10       |
| Authorizing Legislation .....                         | 11       |
| Appropriations History .....                          | 12       |
| Justification of Budget Request .....                 | 13       |
| Budget Authority by Object Class .....                | 23       |
| Salaries and Expenses.....                            | 24       |
| Detail of Full-Time Equivalent Employment (FTE) ..... | 25       |
| Detail of Positions.....                              | 26       |

# National Institute of Dental and Craniofacial Research



**NATIONAL INSTITUTES OF HEALTH**

National Institute of Dental and Craniofacial Research

*For carrying out section 301 and title IV of the Public Health Services Act with respect to dental diseases \$420,369,000.*

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

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

| <b>Source of Funding</b>   | <b>FY 2010<br/>Actual</b> | <b>FY 2011<br/>CR</b> | <b>FY 2012<br/>PB</b> |
|--|---------------------------|-----------------------|-----------------------|
| Appropriation  | \$413,236                 | \$413,236             | 420,369               |
| Type 1 Diabetes  | 0                         | 0                     | 0                     |
| Rescission   | 0                         | 0                     | 0                     |
| Supplemental   | 0                         | 0                     | 0                     |
| Subtotal, adjusted appropriation   | 413,236                   | 413,236               | 420,369               |
| Real transfer under Director's one-percent transfer authority (GEI)        | (\$637)                   | \$0                   | 0                     |
| Real transfer under Secretary's one-percent transfer authority             | (62)                      | 0                     | 0                     |
| Comparative Transfers to NLM for NCBI and Public Access                    | (165)                     | (351)                 | 0                     |
| Comparative transfer under Director's one-percent transfer authority (GEI) | 637                       | 0                     | 0                     |
| Comparative transfer under Secretary's one-percent transfer authority      | 0                         | 0                     | 0                     |
| Subtotal, adjusted budget authority  | 413,009                   | 412,885               | 420,369               |
| Unobligated balance, start of year   | 0                         | 0                     | 0                     |
| Unobligated balance, end of year   | 0                         | 0                     | 0                     |
| Subtotal, adjusted budget authority  | 413,009                   | 412,885               | 420,369               |
| Unobligated balance lapsing  | (10)                      | 0                     | 0                     |
| Total obligations  | 412,999                   | 412,885               | 420,369               |

<sup>1</sup> Excludes the following amounts for reimbursable activities carried out by this account:  
FY 2010 - \$2,291    FY 2011 - \$2,696    FY 2012 - \$2,696

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

| MECHANISM                                       | FY 2010<br>Actual |           | FY 2011<br>CR |           | FY 2012<br>PB |           | Change vs. FY 2010 |           |
|---|-------------------|-----------|---------------|-----------|---------------|-----------|--------------------|-----------|
|   | No.               | Amount    | No.           | Amount    | No.           | Amount    | No.                | Amount    |
| Research Grants                                 |                   |           |               |           |               |           |                    |           |
| <u>Research Projects</u>                        |                   |           |               |           |               |           |                    |           |
| Noncompeting                                    | 449               | \$193,169 | 446           | \$188,607 | 442           | \$184,920 | (7)                | (\$8,249) |
| Administrative Supplements                      | (20)              | 2,317     | (13)          | 1,500     | (13)          | 1,500     | 7                  | (817)     |
| Competing:                                      |                   |           |               |           |               |           |                    |           |
| Renewal   | 45                | 20,144    | 44            | 19,866    | 43            | 19,800    | (2)                | (344)     |
| New   | 126               | 45,473    | 122           | 45,049    | 116           | 51,062    | (10)               | 5,589     |
| Supplements                                     | 1                 | 874       | 1             | 862       | 1             | 880       | 0                  | 6         |
| Subtotal, Competing                             | 172               | \$66,491  | 167           | \$65,777  | 160           | \$71,742  | (12)               | \$5,251   |
| Subtotal, RPGs                                  | 621               | \$261,977 | 613           | \$255,884 | 602           | \$258,162 | (19)               | (\$3,815) |
| SBIR/STTR                                       | 28                | \$8,921   | 28            | \$8,938   | 28            | \$9,099   | 0                  | \$178     |
| Research Project Grants                         | 649               | \$270,898 | 641           | \$264,822 | 630           | \$267,261 | (19)               | (\$3,637) |
| Research Centers                                |                   |           |               |           |               |           |                    |           |
| Specialized/Comprehensive                       | 7                 | \$16,658  | 6             | \$14,542  | 6             | \$14,690  | (1)                | (\$1,968) |
| 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                                | 7                 | \$16,658  | 6             | \$14,542  | 6             | \$14,690  | (1)                | (\$1,968) |
| Other Research                                  |                   |           |               |           |               |           |                    |           |
| Research Careers                                | 63                | \$7,722   | 63            | \$7,736   | 63            | \$7,810   | 0                  | \$88      |
| 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   | 18                | 1,241     | 17            | 1,153     | 17            | 1,164     | (1)                | (77)      |
| Other Research                                  | 81                | \$8,963   | 80            | \$8,889   | 80            | \$8,974   | (1)                | \$11      |
| Total Research Grants                           | 737               | \$296,519 | 727           | \$288,253 | 716           | \$290,925 | (21)               | (\$5,594) |
| Research Training                               |                   |           |               |           |               |           |                    |           |
| Individual Awards                               | 67                | \$2,739   | 75            | \$4,139   | 95            | \$5,436   | 28                 | \$2,697   |
| Institutional Awards                            | 278               | 13,143    | 238           | 11,435    | 218           | 10,615    | (60)               | (2,528)   |
| Total Research Training                         | 345               | \$15,882  | 313           | \$15,574  | 313           | \$16,051  | (32)               | \$169     |
| Research & Development Contracts<br>(SBIR/STTR) | 24                | \$14,813  | 28            | \$21,450  | 28            | \$24,918  | 4                  | \$10,105  |
|   | 0                 | \$17      | 0             | \$17      | 0             | \$0       | 0                  | \$17      |
|   | <u>FTEs</u>       |           | <u>FTEs</u>   |           | <u>FTEs</u>   |           | <u>FTEs</u>        |           |
| Intramural Research                             | 157               | \$61,906  | 158           | \$63,324  | 158           | \$63,950  | 1                  | \$2,044   |
| Research Management and Support                 | 83                | 23,889    | 83            | 24,284    | 83            | 24,525    | 0                  | 636       |
| Construction                                    |                   | 0         |               | 0         |               | 0         |                    | 0         |
| Buildings and Facilities                        |                   | 0         |               | 0         |               | 0         |                    | 0         |
| Total, NIDCR                                    | 240               | \$413,009 | 241           | \$412,885 | 241           | \$420,369 | 1                  | \$7,360   |

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

## **Major Changes in the Fiscal Year 2012 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 2012 budget request for NIDCR, which is \$7.36 million more than the FY 2010 Estimate, for a total of \$420.369 million.

Research Project Grants (RPGs; -\$3.815 million; total \$258.162 million): NIDCR will fund a projected 160 competing awards in FY 2012, approximately the same number as in FY 2010. About 442 noncompeting RPG awards, totaling \$184.920 million also will be made in FY 2011.

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

| <b>FY 2010 Actual</b>                         |                      |                         |                            | <b>\$413,009</b>        |
|---|----------------------|-------------------------|----------------------------|-------------------------|
| <b>FY 2012 Estimate</b>                       |                      |                         |                            | <b>420,369</b>          |
| <b>Net change</b>                             |                      |                         |                            | <b>\$7,360</b>          |
| <b>CHANGES</b>                                | <b>2012 Estimate</b> |                         | <b>Change from FY 2010</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 2010 pay increase |                      |                         |                            |                         |
|   |                      | \$23,676                |                            | \$143                   |
|   |                      | 23,676                  |                            | \$0                     |
|   |                      | 23,676                  |                            | (\$91)                  |
|   |                      | 10,698                  |                            | 106                     |
|   |                      | 29,576                  |                            | 290                     |
| Subtotal                                      |                      |                         |                            | \$448                   |
| 2. Research Management and Support:           |                      |                         |                            |                         |
| a. Annualization of January 2010 pay increase |                      |                         |                            |                         |
|   |                      | \$11,362                |                            | \$68                    |
|   |                      | 11,362                  |                            | \$0                     |
|   |                      | 11,362                  |                            | (\$44)                  |
|   |                      | 3,747                   |                            | 37                      |
|   |                      | 9,416                   |                            | 92                      |
| Subtotal                                      |                      |                         |                            | \$153                   |
| Subtotal, Built-in                            |                      |                         |                            | \$601                   |

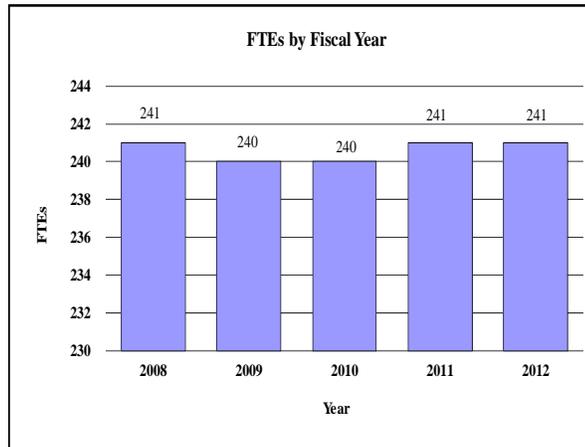
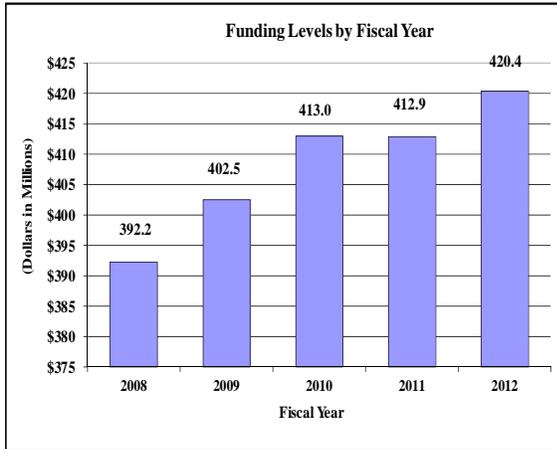
**NATIONAL INSTITUTES OF HEALTH**  
**National Institute of Dental and Craniofacial Research**

**Summary of Changes--continued**

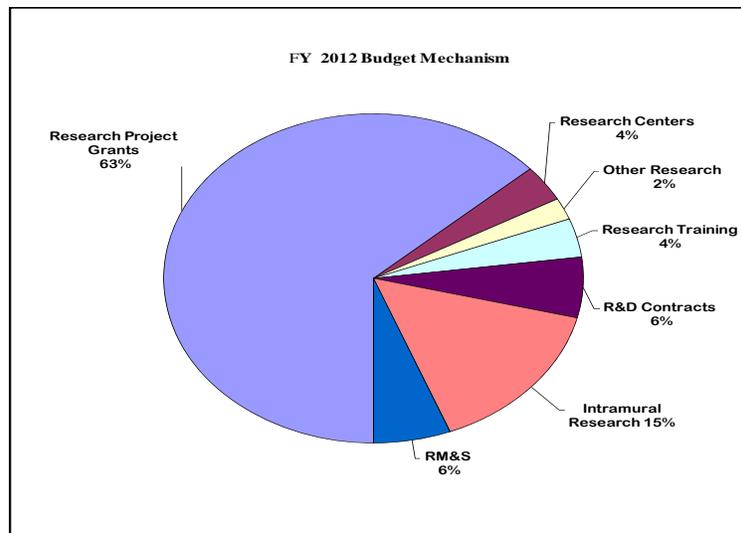
| CHANGES                               | 2012<br>Estimate   |           | Change from FY 2010 |           |
|---------------------------------------|--------------------|-----------|---------------------|-----------|
|                                       | No.                | Amount    | No.                 | Amount    |
| B. Program:                           |                    |           |                     |           |
| 1. Research Project Grants:           |                    |           |                     |           |
| a. Noncompeting                       | 442                | \$186,420 | (7)                 | (\$9,066) |
| b. Competing                          | 160                | 71,742    | (12)                | 5,251     |
| c. SBIR/STTR                          | 28                 | 9,099     | 0                   | 178       |
| Total                                 | 630                | \$267,261 | (19)                | (\$3,637) |
| 2. Research Centers                   | 6                  | \$14,690  | (1)                 | (\$1,968) |
| 3. Other Research                     | 80                 | 8,974     | (1)                 | 11        |
| 4. Research Training                  | 313                | 16,051    | (32)                | 169       |
| 5. Research and development contracts | 28                 | 24,918    | 4                   | 10,105    |
| Subtotal, Extramural                  |                    | \$331,894 |                     | \$4,680   |
| 6. Intramural Research                | <u>FTEs</u><br>158 | \$63,950  | <u>FTEs</u><br>1    | \$1,596   |
| 7. Research Management and Support    | 83                 | 24,525    | 0                   | 483       |
| 8. Construction                       |                    | 0         |                     | 0         |
| 9. Buildings and Facilities           |                    | 0         |                     | 0         |
| Subtotal, program                     | 241                | \$420,369 | 1                   | \$6,759   |
| Total changes                         |                    |           |                     | \$7,360   |

## Fiscal Year 2012 Budget Graphs

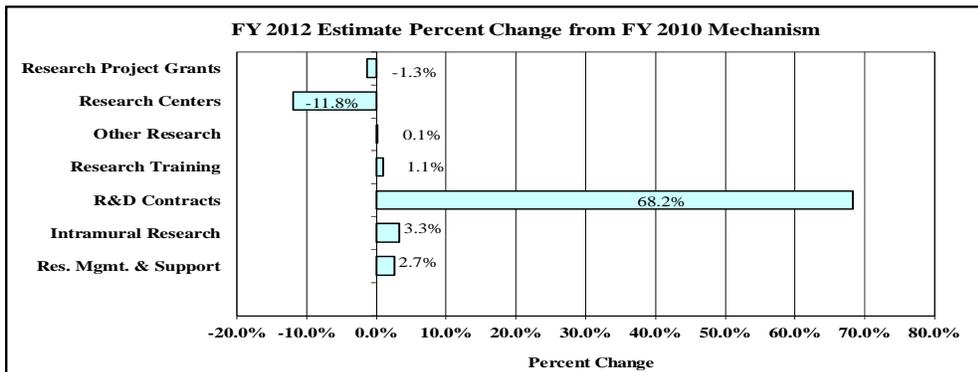
### History of Budget Authority and FTEs



### 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 2010<br>Actual |           | FY 2011<br>CR |           | FY 2012<br>PB |           | Change vs.<br>FY 2010 |         |
|--|-------------------|-----------|---------------|-----------|---------------|-----------|-----------------------|---------|
|  | FTEs              | Amount    | FTEs          | Amount    | FTEs          | Amount    | FTEs                  | Amount  |
| <b>Extramural Research</b>               |                   |           |               |           |               |           |                       |         |
| <u>Detail:</u>                           |                   |           |               |           |               |           |                       |         |
| Oral and Craniofacial Biology            |                   | \$212,649 |               | \$211,347 |               | \$215,713 |                       | 3,064   |
| Clinical Research                        |                   | 55,552    |               | 55,244    |               | 56,336    |                       | 784     |
| Behavioral and Social Sciences Research  |                   | 10,232    |               | 10,175    |               | 10,376    |                       | 144     |
| Translational Genetic and Genomics       |                   | 48,781    |               | 48,511    |               | 49,469    |                       | 688     |
| <b>Subtotal, Extramural</b>              |                   | \$327,214 |               | \$325,277 |               | \$331,894 |                       | \$4,680 |
| <b>Intramural Research</b>               | 157               | \$61,906  | 158           | \$63,324  | 158           | \$63,950  | 1                     | \$2,044 |
| <b>Research Management &amp; Support</b> | 83                | \$23,889  | 83            | \$24,284  | 83            | \$24,525  | 0                     | \$636   |
| <b>TOTAL</b>                             | 240               | \$413,009 | 241           | \$412,885 | 241           | \$420,369 | 1                     | \$7,360 |

1. Includes FTEs which are reimbursed from the NIH Common Fund for Medical Research.
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/<br/>Other Citation</b> | <b>U.S. Code<br/>Citation</b> | <b>2011 Amount<br/>Authorized</b> | <b>FY 2010<br/>Estimate</b> | <b>2012 Amount<br/>Authorized</b> | <b>FY 2012<br/>PB</b> |
|---|------------------------------------|-------------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------|
| Research and Investigation                                | Section 301                        | 42§241                        | Indefinite                        |                             | Indefinite                        |                       |
| National Institute of Dental and<br>Craniofacial Research | Section 401(a)                     | 42§281                        | Indefinite                        | \$413,009,000               | Indefinite                        | \$420,369,000         |
| <b>Total, Budget Authority</b>                            |                                    |                               |                                   | <b>\$413,009,000</b>        |                                   | <b>\$420,369,000</b>  |

### Appropriations History

| Fiscal Year  | Budget Estimate to Congress | House Allowance | Senate Allowance | Appropriation |
|--------------|-----------------------------|-----------------|------------------|---------------|
| 2003         | \$374,319,000               | \$374,319,000   | \$374,067,000    | \$374,067,000 |
| Rescission   |                             |                 |                  | (\$2,431,000) |
| 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    |               |
| Rescission   |                             |                 |                  |               |
| 2012         | \$420,369,000               |                 |                  |               |

## 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 (BA):

|     | FY 2010<br>Actual | FY 2011<br>Continuing<br>Resolution | FY 2012<br>Budget<br>Request | FY 2012 +/-<br>FY 2010 |
|-----|-------------------|-------------------------------------|------------------------------|------------------------|
| BA  | \$413,009,000     | \$412,885,000                       | \$420,369,000                | +\$7,360,000           |
| FTE | 240               | 241                                 | 241                          | +1                     |

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

### Director's Overview

The National Institute of Dental and Craniofacial Research (NIDCR) conducts and supports research that builds on the current foundation of knowledge and tools to enable the next great transformation in oral health care – providing patients with more precise diagnoses, greater opportunity to practice prevention, and more efficient, targeted therapies. NIDCR-supported research will accelerate the next breakthroughs in the prevention and treatment of oral, dental and craniofacial diseases and conditions, improving our own health and that of our children.

Molecular-based oral health care will transform the most fundamental principle of the profession – restoration of form and function – as dentists will use the precision of individual genetic and physiological information as their operational guide. For example, information emerging from NIDCR investments in genome-wide association studies (GWAS) of dental caries complements other clinical research on caries risk factors, allowing genetic factors to be considered, along with behavioral, environmental, and microbial determinants of caries development, when treatment decisions are made. In addition, a recent GWAS of cleft lip and/or cleft palate<sup>1</sup>, the fourth most common birth defect, is providing insight into genetic variants and their interplay with non-genetic factors, which may lead to improved prevention and treatment strategies.

NIDCR-developed research tools will soon profile the circuitry of a tumor cell biopsied from the mouth, guiding selection of the chemotherapy drugs most likely to target and destroy the internal wiring of the tumor cell, leaving healthy tissue untouched. NIDCR-supported researchers recently provided proof of principle that a nano-bio-chip could be an effective screening tool for oral cancer<sup>2</sup>. In support of this progress, the NIDCR-funded Oral Cancer Genome Project is

---

<sup>1</sup> Beaty TH, Murray JC, Marazita ML, et. al (2010). A genome-wide association study of cleft lip with and without cleft palate identifies risk variants near *MAFB* and *ABCA4*. *Nat Genet*; 42(6):525-9. Epub 2010 May 2.

<sup>2</sup> Weigum et al.(2010). Nano-bio-chip sensor platform for examination of oral exfoliative cytology. *Cancer Prev Res (Phila Pa)* 3(4):518-28.

developing a comprehensive catalog of the genomic changes that occur in oral and pharyngeal cancers – a group of malignancies that kill about 7,600 people in the US each year.

The NIH Human Microbiome Project (HMP) is using advances in high throughput nucleic acid sequencing to identify the microbial world residing in several sites of the human body, including the mouth to advance our understanding of the role of the microbiome in human health and disease. A team of NIDCR grantees comprehensively identified the fungal organisms - and their collective set of genes – present in the human mouth<sup>3</sup>. Understanding the relationships between fungi and other members of the oral microbiome will shed light on the pathogenicity of these organisms and may lead to the discovery of novel therapeutics for fungi, of particular importance to immune compromised patients. Dovetailing with the HMP, NIDCR launched the initiative on “Metagenomic Evaluation of Oral Polymicrobial Disease” in FY 2010 to support studies to examine the relationship between the oral microbial content and a number of disease states, including malignancy, diabetes, HIV infection, periodontal diseases, and dental caries.

NIDCR scientists, in collaboration with NIH colleagues, are carrying out a number of high-throughput screens for small molecules – screens which can yield powerful biological tools and potential new medicines. These efforts include a screen to block the action of over-active mutated forms of an intracellular signaling molecule which cause fibrous dysplasia/McCune-Albright syndrome, a painful bone and endocrine disorder, and another screen to regulate the activity of a central pain-transmitting ion channel in neurons.

Future practitioners will employ a range of targeted therapies to control chronic inflammation of tooth-supporting tissue. NIDCR-supported scientists are using new high-throughput multiplex technologies to identify biomarkers that can be used to diagnose periodontal diseases and monitor response to therapy<sup>4</sup>. In animal models, researchers insert a tiny biodegradable plastic scaffold into the gum wound, which releases a natural work force of stem cells and other biologicals to regenerate the tissue and restore its function. If proven safe and effective, dentists could use this approach to treat the millions of Americans with advanced periodontal disease.

NIDCR’s practice-based research networks (PBRNs) are currently conducting nearly two dozen studies expected to result in more effective and potentially less costly approaches to dental treatment while expediting translation of these results into clinical practice. The PBRNs couple the clinical insights of practitioners with the expertise of their academic colleagues to design and conduct studies that provide evidence useful in daily patient care. In FY 2012, NIDCR will launch a new version of the PBRN initiative, expanding its scope and range of delivery settings.

NIDCR-supported studies seek to improve the treatment of oral and craniofacial diseases and disorders, including studies comparing the effectiveness of traditional surgery with guided bone growth and orthodontics to correct malocclusions associated with cleft lip and palate, a clinical trial to establish the optimal time to close cleft palate, and a study to determine if earlier first

---

<sup>3</sup> Ghannoum et al. (2010). Characterization of the oral fungal microbiome (mycobiome) in healthy individuals. *PLoS Pathog* 6(1):e1000713.

<sup>4</sup> Shaddox L, Wiedey J, Bimstein E, Magnuson I, Clare-Salzler M, Aukhil I, Wallet SM (2010). Hyper-responsive phenotype in localized aggressive periodontitis. *J Dent Res*. Feb;89(2):143-8

dental visits of children enrolled in Medicaid reduce later dental and medical costs. NIDCR's Oral Health Disparities Centers continue efforts to identify the best methods to reduce oral diseases in disadvantaged and underserved communities. In FY 2012, seven clinical trials will test a variety of strategies, including providing oral health preventive services through head start programs, pediatricians' offices, and in-home prenatal visits to reduce early childhood caries.

NIDCR supports initiatives that couple discoveries in the pathophysiology of human diseases, with innovations in engineering and electronics, to develop point-of-care medical diagnostic devices. Driving this change will be the use of saliva, an easy-to-access diagnostic fluid that may be useful in the evaluation of oral and systemic diseases, including the identification of HIV, oral cancer, and cardiovascular disease. As envisioned, a drop of saliva will be collected and loaded onto a small, all-in-one device that rapidly measures biomarkers associated with disease allowing early detection of disease – whether in a clinic or in remote resource-poor settings.

NIDCR is enhancing career paths for researchers dedicated to solving problems in oral, dental and craniofacial health, which aligns with the Director's Reinvigorating the Biomedical Research theme. A new Career Transition Award (K22) program was recently created to enable outstanding clinical fellows to receive research training in an NIDCR intramural laboratory; NIDCR will support their subsequent independent research for three years as they transition to an extramural institution. In FY 2012, NIDCR will launch an innovative training initiative to expand the community of scientists researching temporomandibular disorders and orofacial pain, with the goal of creating multidisciplinary research teams led by new investigators who can exploit recent advances in genetics, bio-engineering, and bio-behavioral research.

Not long ago, molecular-based care sounded more like science fiction than everyday reality. But the pace of the research has accelerated greatly, and each month brings unexpected discoveries, building this future of molecular medicine and biology-based oral health care.

**Overall Budget Policy:** The FY 2012 request for NIDCR is \$420.4 million, an increase of \$7.4 million, or 1.8 percent, over the FY 2010 Enacted Level. The budget provides support for a single national Practice-Based Research Network, a one percent average cost increase for competing RPGs, with no inflationary increase for non-competing RPGs. In FY 2012, NIH will provide an increase of four 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 will build on the two percent increase in stipend levels for FY 2011. Stipend levels were largely flat for several years, and the requested increase will help sustain the development of a highly qualified biomedical research workforce. 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 Therapies for Rare and Neglected Diseases program (TRND), and the Basic Behavioral and Social Sciences Opportunity Network (OppNet).

### **Program Descriptions and Accomplishments**

**Oral and Craniofacial Biology:** NIDCR supports research that seeks to unravel the daunting biological complexity of oral and craniofacial cells, tissues, and organs, as well as research on approaches to repair, restore, and regenerate dental, oral, and craniofacial structures and

functions. NIDCR basic and translational research programs span salivary biology and immunology, epithelial cell regulation and transformation, molecular and cellular neuroscience, microbiology, and mineralized tissue physiology. For example, loss of salivary gland function is a serious medical problem associated with a number of conditions, including Sjögren's Syndrome (SS), an autoimmune disease affecting up to four million Americans, mostly middle age women. NIDCR supports studies in genetics, biomarkers, physiology and pathology of this debilitating condition. These include development of a rapid and automated test to diagnose a range of clinical subtypes of SS, which could improve diagnoses, allow targeted treatment, and provide insight into many related health conditions including lymphoma, thyroid dysfunction, painful peripheral neuropathy, and gastrointestinal problems. Oral fluid-based diagnostics hold the promise of translating basic science into new and better treatments, including a new point-of-care medical device for *in vitro* disease diagnosis. Oral fluids can be collected non-invasively, quickly and conveniently and then profiled on fully integrated and automated miniaturized platforms. NIDCR-funded projects that seek to apply the technology include two new clinical studies to validate the utility of a nano-bio-chip sensor system, one for the diagnosis of heart attack in patients presenting with chest pain at the emergency room using saliva, and another for rapid oral cancer detection using brush biopsies of suspicious oral lesions.

#### **Program Portrait: Salivary Gland Cancer**

FY 2010 Level: \$39,530,000

FY 2012 Level: \$40,321,000

Most Americans seldom, if ever, stop to think of the possibility of a tumor developing in one of their salivary glands. But an estimated 3,600 Americans will be diagnosed with Salivary gland carcinomas (SGCs) this year. Little is known about their causes, how fast a specific tumor grows, if it can spread in the body, and which kinds of chemotherapy drugs might work best. Currently, there are limited therapeutic options for this group of rare, albeit deadly cancers. The best option is to undergo surgery and radiation therapy— and hope for the best.

But hope, through a better research infrastructure, is finally on the way. NIDCR is supporting efforts to allow more systematic and meaningful studies of SGCs. Recently, the Institute provided support to establish the first salivary gland tumor biorepository. It addresses one of the longstanding impediments in the field; a scarcity of tumor samples to study. Since its inception in 2007, the biorepository has collected more than 450 benign and malignant tumor specimens, providing scientists around the world access to salivary tumor samples and an organizational hub to seed productive collaborations. In a parallel approach, NIDCR is working through the NIH Rare Diseases Clinical Research Network to support a research consortium with the goal of identifying biomarkers for the development of new therapeutic strategies for SGCs. Building on these efforts, in FY 2012, NIDCR is launching the “Molecular Characterization of Salivary Gland Tumors” initiative to promote basic and translational SGC research, such as defining the molecular signatures of tumor initiation and progression. This initiative will facilitate basic scientific discoveries, thus paving the way to translational medicine for this orphan and understudied group of tumors.

Surgical removal of SGCs can result in loss of salivary gland function, a serious medical problem that can also be produced by radiotherapy, Sjögren's Syndrome, adverse drug reactions, and age-related atrophy. Loss of gland function has long-term consequences such as loss of dentition, difficulty with eating, and associated disfigurement. NIDCR scientists recently discovered that nerves are required during development to maintain a pool of salivary stem cells that support salivary gland growth. Another team of NIDCR scientists recently detailed the molecular signaling pathway and physical mechanisms crucial for clefting and branching of the salivary gland during development, which is critical for producing sufficient saliva. Building upon advances such as these, scientists think it will be possible to regenerate damaged salivary glands or even engineer artificial ones. To support this effort, NIDCR is planning a new initiative to stimulate research on restoring damaged salivary gland structure and function.

Orofacial Pain: Prospective Evaluation and Risk Assessment (OPPERA) is a seven-year, multi-disciplinary research program with the goal of identifying the biological, psychological, behavioral, and genetic risk factors that lead to the onset of temporomandibular joint disorder (TMJD) and orofacial pain. The program, in its sixth year, completed enrollment and baseline data collection of 3,200 initially disease-free subjects and over 200 TMJD cases. The program will enroll another 1,200 TMJD cases this year to facilitate a genome wide association study (GWAS), the first such large-scale study in the pain field. This program could uncover new and unique targets for therapies aimed at preventing or reversing the development of chronic TMJDs.

**Program Portrait: Towards a Better Resolution of Inflammatory Conditions, Including Pain**

FY 2010 Level: \$22,558,000

FY 2012 Level: \$23,009,000

Inflammation is the body's basic response to injury. The recent work of an NIDCR grantee and his colleagues highlights how discoveries focusing on a single biological response, such as inflammation, can have potentially profound therapeutic implications on a number of conditions.

For millions of Americans, chronic pain is a daily challenge. The molecules and bio-circuitry that convey noxious sensory signals to the brain, causing us to perceive the pain, remains poorly understood and thus difficult to target with drugs. NIDCR-supported researchers have found for the first time in animal studies that certain lipid molecules called resolvins, which mediate the highly regulated biochemical shut down of inflammatory responses, are extremely potent in controlling pain sensation in both the central and peripheral nervous systems. Indeed, their data show that the resolvin compound RvE1 is more potent than morphine and NSAIDs in blocking pain responses, while also reducing several measures of inflammation in rodent pain models<sup>5</sup>. Since these resolvins are normally found in the body, they are likely to be safe and non-addictive when used therapeutically. Additional research is under way to explore these compounds further and translate them into new analgesics for pain management.

Uncontrolled or unresolved inflammation can also contribute to periodontal disease that leads to bone destruction and tooth loss. Recent evidence suggests that a different class of endogenous lipid mediators called lipoxins actively participate in the dampening of inflammation. Since current therapies for periodontal disease remain inadequate, a stable lipoxin-A<sub>4</sub> analogue is being developed by the same team of NIDCR-supported scientists for use as a topical treatment. The remarkable potency of lipoxins compared to traditional anti-inflammatory drugs (e.g. NSAIDs) could result in new treatments to reduce inflammation without the unwanted side effects associated with some anti-inflammatory drugs. NIDCR is supporting efforts to demonstrate the efficacy of lipoxin against periodontal diseases.

**Budget Policy:** The FY 2012 budget estimate for this program is \$215.71 million, an increase of \$3.06 million or 1.44 percent compared to the FY 2010 appropriation level. High priority will be given to support highly meritorious new research projects and ongoing initiatives. Also, **expanding research capacity in TMJD and orofacial pain research** will be given a high priority. Research in this field has not advanced as rapidly as that of other fields due to both the complexity of the conditions involved and a small, non self-sustaining research community. Currently, the etiologies and pathologies underlying these conditions are not well understood, resulting in reluctance by some investigators to enter this field. Compounding this, there are few research centers of excellence that address orofacial pain conditions and few unsolicited applications to fund orofacial pain research. Previous NIDCR attempts to use solicited research proposals to encourage more applications and attract pain researchers from other fields have not

<sup>5</sup> Xu ZZ, et al., (2010). Resolvins RvE1 and RvD1 attenuate inflammatory pain via central and peripheral actions. Nat Med. 16(5):592-7, 1p following 597. Epub 2010 Apr 11.

resulted in sufficient sustained research in TMJD and orofacial pain to adequately address these problems. A new approach to this problem consists of attracting, training and retaining early career basic and clinical scientists willing to join the TMJD and orofacial pain research field. This will be accomplished through a sustained support process incorporating training, mentors (including both those experienced in orofacial pain and other fields), and career development. The goal of this sustained effort is to develop a critical mass of researchers that will incorporate expertise in orofacial pain and other fields to accelerate scientific discovery in understanding and treating TMJD and orofacial pain conditions.

**Clinical Research:** High-quality clinical research is essential to ascertain the natural history, risk factors, and best treatments of oral and craniofacial diseases. NIDCR continues its efforts to catalyze the dental profession's transition to one that delivers care based on robust evidence by supporting many types of research, including multi-center Phase III clinical trials. Practice Based Research Networks (PBRNs), established in 2005 to increase the use of research data and scientific rigor to guide dental treatment decisions, and are currently completing many clinical studies that compare the benefits of different dental procedures, dental materials, and diagnostic strategies under a range of patient and clinical conditions. To date, nearly 1000 practitioner-investigators have participated in these projects and over 30,000 patients from their practices have been enrolled in more than 20 different PBRN studies. The Health Disparities Research Program supports a full spectrum of research studies that identify practical, sustainable approaches for ensuring more disadvantaged Americans can experience good oral health. NIDCR supports five Centers conducting seven different clinical trials to test approaches to reduce Early Childhood Caries, poor oral health of disadvantaged pregnant women, and oral cancer in different populations. The Oral HIV/AIDS Research Alliance (OHARA) aims to investigate the oral complications associated with HIV/AIDS and, in particular, the effects of antiretroviral agents on the development of oral mucosal lesions and associated fungal and viral pathogens. A total of eight clinical studies have been designed and completed including one assessing the extent of HIV-related oral diseases and treatment outcomes, and another measuring change in HIV or Kaposi's sarcoma viral load in saliva of individuals under different combination treatments.

**Budget Policy:** The FY 2012 budget estimate for this program is \$56.33 million, an increase of \$0.78 million or 1.41 percent compared to the FY 2010 appropriation level. High priority will be given to support highly meritorious new research projects, ongoing initiatives, and a new initiative to **increase the research capacity of the PBRNs**. NIDCR will build on its investment to date in dental PBRN research and support a single National Practice-Based Research Network (NDPBRN) with regional nodes starting in FY 2012. The blueprint for the expanded National PBRN was developed in FY 2011 after extensive evaluation of the existing networks. The goal is to create a network that will have broader representation than we currently have with the three regional dental PBRNs. NIDCR will fund a single cooperative agreement, under the direction of a National Network Director, to support NDPBRN infrastructure and research on dental practices important to practitioners to provide useful evidence for daily patient care and translate research findings into clinical practice.

**Behavioral and Social Sciences Research:** This program supports research that aims to understand how behavioral and social factors contribute to oral health, and clinical research to

develop efficacious and sustainable interventions to improve oral health by targeting relevant behavioral and social factors. Building on a strong foundation of basic behavioral and social research in oral health, the program has focused its efforts on clinical intervention research. Recommendations made during an expert meeting in 2009 led the program to develop new tools to support rigorous behavioral and social intervention research to improve oral health. A Funding Opportunity Announcement was issued for FY 2011 to support planning activities required for conducting rigorous intervention research. The recommendations also led to the development of a special journal issue to provide guidance about state-of-the-science methods in behavioral and social intervention research to improve oral health. The program commissioned a set of manuscripts on Psychosocial Intervention Essentials to be published in March, 2011 in the Journal of Public Health Dentistry. The topics include how to conduct cost analyses in behavioral and social intervention research. The guidance provided in this special issue is expected to be a resource for oral health researchers as they prepare grant applications in FY 2012 and beyond.

**Budget Policy:** The FY 2012 budget estimate for this program is \$10.37 million, an increase of \$0.14 million or 1.41 percent compared to the FY 2010 appropriation level. Priority will be given to support highly meritorious new research projects and ongoing initiatives, and a new initiative involving **individual tailoring and community targeting of social and behavioral interventions** to improve oral health. One widely-held belief in behavioral and social intervention research is that interventions need to be tailored to meet individuals' specific needs, or targeted to meet the needs of communities or populations. Currently, there is an insufficient empirical basis for deciding when tailoring or targeting are needed, and which aspects of an intervention need to be tailored or targeted, leading to an inefficient proliferation of behavioral or social interventions. There is a pressing need to understand which aspects of behavioral and social interventions require tailoring for individuals, or targeting for communities or populations. To address these aspects, NIDCR will first seek input from experts in the extramural research community and then develop a focused grant program on tailoring and targeting.

**Translational Genetics and Genomics:** This program places a strong emphasis on integrative research, comparative studies across species, and genomics, epigenomics, and other "omics" to provide insights into the genetics of craniofacial development, craniofacial and dental disorders, and oral health in children and adults. The ultimate goal is to translate the most promising genomic and developmental findings into clinical studies, leading to improved preventive measures, diagnostic tests, prenatal care, and treatments to minimize the adverse effects of dental and craniofacial conditions and disorders and to maximize oral health. The FaceBase Consortium, funded in 2009, has made significant progress towards its goal of creating a publicly available database compiling the biological and genetic instructions to construct the middle region of the human face. FaceBase's individual scientific projects have begun uploading their data to the FaceBase website ([www.facebase.org](http://www.facebase.org)) which is attracting researchers from outside of the consortium. FaceBase's informatics development team is developing innovative ways to tie together and display data from the various projects to facilitate novel insights into craniofacial development. Genome-wide association studies (GWAS) of cleft lip and cleft palate and of dental caries were completed in 2010 and have provided important new leads about the role genetic factors and gene-environment interaction play in the development of these conditions. For example, the cleft lip and/or palate study identified two areas of the genome that are

associated with cleft lip with or without cleft palate. Preliminary laboratory studies indicate that a gene in one of the areas is involved in the development of the palate. The GWAS study also verified associations with areas of the genome identified in other studies. Studies using DNA sequencing and model organisms are discovering more about the specific genes and gene variants involved and how gene variants affect body function. The Oral Cancer Genome Project is developing a comprehensive catalog of the genomic changes that occur in cells during the development of oral and pharyngeal cancers, the sixth most common form of cancer world-wide. This data will be a powerful driver for oral cancer research at multiple complementary levels such as developing more effective methods for early detection and treatment.

Budget Policy: The FY 2012 budget estimate for this program is \$49.46 million, an increase of \$0.68 million or 1.4 percent compared to the FY 2010 appropriation level. Priority will be given to support highly meritorious new research projects and ongoing initiatives. These include developing resources for genomic study of **Sjögren's syndrome** and feasibility work for genomic study of **craniofacial microsomia** (a birth defect involving development of the jaw, ears, and other craniofacial structures), **oral cancer**, and **periodontal (gum) disease**.

**Intramural Research:** The Division of Intramural Research performs highly innovative research that covers many aspects of oral and craniofacial health, and complements the research supported by NIDCR's extramural grant program. 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; genetic disorders and tumors of the oral cavity; the cellular and molecular basis of pain, and the development of improved methods to diagnose and treat disease. Through the efforts of the NIDCR investigator-coordinated NIH intramural Bone Marrow Stromal Cells (BMSC) Transplantation Center, clinical grade BMSCs, shown to have a therapeutic effect on several injuries and diseases, are being produced and first used for the treatment of patients with acute graft-versus-host disease. In addition, NIDCR scientists have discovered the molecular and cellular basis for sodium salt taste in mice. These studies may be relevant to human taste and aid in the design of tasty foods with healthier levels of sodium salts. NIDCR scientists are also investigating why mutations in a particular dentin protein can cause both the mild dentin dysplasia and the more severe dentinogenesis imperfecta, two diseases that lead to abnormal tooth development. Scientists are using single-wall carbon nanotubes for detecting cancer biomarkers in serum and tissues. These nanotubes were also used to deliver chemotherapeutic agents coupled with epidermal growth factors specifically targeted to head and neck cancer cells. Researchers are exploring the cellular and molecular basis for osteoarthritis (OA) and studying mouse models that are predicted to resist OA to understand the relationship of bone and cartilage in the progression of this painful degenerative disease. Extracellular matrix (ECM) components play a role in supporting cancers that spread to bone. One such ECM component, the protein WISP-1, was discovered to be highly expressed in early-stage human prostate cancer. Treatment with antibodies to WISP-1 reduced the growth of human prostate cancers grown in mice. Experiments are underway to see whether these antibodies also inhibit cancer metastasis in these models.

### **Program Portrait: Rapamycin and Head and Neck Cancer**

FY 2010 Level: \$39,530,000

FY 2012 Level: \$40,321,000

On the southwestern tip of the Easter Islands, sea cliff and volcano crater converge to provide one of nature's most treacherous but stunning views of the Pacific Ocean. In the 1960s, researchers collected 73 soil samples from this isolated, wind-swept spot during a worldwide search for new biochemicals with infection-fighting properties. Luck was on their side. They later discovered that a compound in the soil, which they named rapamycin (after the Easter Island term for their homeland, *Rapa Nui*), had anti-fungal properties. The search for the mechanism by which rapamycin protects against fungal infections led to the discovery of a protein that was named mammalian "Target of Rapamycin" or "mTOR". mTOR is now known to play multiple roles in immune function, glucose and fat metabolism, normal and tumoral growth, and aging. Fifty-plus years later, rapamycin, which inhibits the activity of mTOR, has become a workhorse drug in organ transplantation, oncology, and multiple emerging medical fields. But its potential life-saving applications continue to be further refined.

An excellent example is the work of NIDCR scientists, who showed as early as 2004<sup>6</sup> that rapamycin specifically and potently acts upon an essential signaling pathway in head and neck squamous cell carcinoma, the most common of the head and neck cancers. As part of an international initiative headed by NIDCR, these scientists collected hundreds of head and neck cancer tissues from all over the world<sup>7</sup>. Using new molecular-pathology techniques, they observed that mTOR is aberrantly activated in the vast majority of these clinical samples irrespective of the source country. They also showed that cells derived from head and neck cancer lesions display elevated mTOR function. In translational efforts the scientists developed novel mouse models for head and neck cancer by using state-of-the-art genetic engineering techniques. The impact of rapamycin administration in these mice was remarkable. Rapamycin caused the regression of established cancer lesions and prevented the development of new ones from pre-malignant lesions. New evidence suggests that rapamycin may also halt the metastatic spread of head and neck cancer, thereby increasing animal survival. In collaboration with the National Cancer Institute, the NIDCR investigators have begun a clinical trial to evaluate the possible survival benefits of treating head and neck cancer patients with rapamycin before surgical removal of their tumors. These studies may lead to improvement in the five-year survival rate for head and neck cancer, which has remained constant at 50 percent for more than three decades. Melding basic science breakthroughs with decades of existing clinical data on rapamycin administration, this clinical trial could clear the way for more targeted and effective treatment of head and neck cancer patients.

**Budget Policy:** The FY 2012 budget estimate for this program is \$63.95 million, an increase of \$2.04 million or 3.30 percent compared to the FY 2010 appropriation level. Funds will allow continued support for ongoing research.

**Research Management and Support:** This budget category 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. The NIDCR participates in the support of the Interdisciplinary Research Consortia funded through the NIH Common Fund. 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

<sup>6</sup> Amornphimoltham P, et al., (2004). Persistent activation of the Akt pathway in head and neck squamous cell carcinoma: a potential target for UCN-01. *Clin Cancer Res.* 10(12 Pt 1):4029-37.

<sup>7</sup> Molinolo AA, et al., (2007). Dissecting the Akt/mammalian target of rapamycin signaling network: emerging results from the head and neck cancer tissue array initiative. *Clin Cancer Res.* 13(17):4964-73.

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 2012 budget estimate for this program is \$24.53 million, an increase of \$0.64 million or 2.66 percent compared to the FY 2010 appropriation level. Funds will allow continued support for ongoing activities.

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

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

|   | <b>FY 2010<br/>Actual</b> | <b>FY 2012<br/>PB</b>       | <b>Increase or<br/>Decrease</b> | <b>Percent<br/>Change</b> |
|---|---------------------------|-----------------------------|---------------------------------|---------------------------|
| Total compensable workyears:  |                           |                             |                                 |                           |
| Full-time employment  | 240                       | 241                         | 1                               | 0.4%                      |
| Full-time equivalent of overtime and holiday hours                          | 0                         | 0                           | 0                               | 0.0%                      |
| Average ES salary   | \$159,069                 | \$159,069                   | \$0                             | 0.0%                      |
| Average GM/GS grade   | 11.4                      | 11.3                        | (0.1)                           | -0.9%                     |
| Average GM/GS salary  | \$90,835                  | \$90,700                    | (\$135)                         | -0.1%                     |
| Average salary, grade established by act of<br>July 1, 1944 (42 U.S.C. 207) | \$122,140                 | \$125,832                   | \$3,692                         | 3.0%                      |
| Average salary of ungraded positions  | 124,027                   | 124,027                     | 0                               | 0.0%                      |
|   |                           |                             |                                 |                           |
| <b>OBJECT CLASSES</b>   | <b>FY 2010<br/>Actual</b> | <b>FY 2012<br/>Estimate</b> | <b>Increase or<br/>Decrease</b> | <b>Percent<br/>Change</b> |
| Personnel Compensation:   |                           |                             |                                 |                           |
| 11.1 Full-time permanent  | \$13,361                  | \$13,461                    | \$100                           | 0.7%                      |
| 11.3 Other than full-time permanent   | 9,838                     | 9,879                       | 41                              | 0.4%                      |
| 11.5 Other personnel compensation   | 670                       | 675                         | 5                               | 0.7%                      |
| 11.7 Military personnel   | 477                       | 497                         | 20                              | 4.2%                      |
| 11.8 Special personnel services payments                                    | 3,500                     | 3,510                       | 10                              | 0.3%                      |
| <b>Total, Personnel Compensation</b>  | <b>\$27,846</b>           | <b>\$28,022</b>             | <b>\$176</b>                    | <b>0.6%</b>               |
| 12.0 Personnel benefits   | \$6,691                   | \$6,733                     | \$42                            | 0.6%                      |
| 12.2 Military personnel benefits  | 283                       | 283                         | 0                               | 0.0%                      |
| 13.0 Benefits for former personnel  | 0                         | 0                           | 0                               | 0.0%                      |
| <b>Subtotal, Pay Costs</b>  | <b>\$34,820</b>           | <b>\$35,038</b>             | <b>\$218</b>                    | <b>0.6%</b>               |
| 21.0 Travel and transportation of persons                                   | \$745                     | \$807                       | \$62                            | 8.3%                      |
| 22.0 Transportation of things   | 135                       | 146                         | 11                              | 8.1%                      |
| 23.1 Rental payments to GSA   | 0                         | 0                           | 0                               | 0.0%                      |
| 23.2 Rental payments to others  | 0                         | 0                           | 0                               | 0.0%                      |
| 23.3 Communications, utilities and<br>miscellaneous charges                 | 522                       | 564                         | 42                              | 8.0%                      |
| 24.0 Printing and reproduction  | 188                       | 201                         | 13                              | 6.9%                      |
| 25.1 Consulting services  | 1,907                     | 1,891                       | (16)                            | -0.8%                     |
| 25.2 Other services   | 4,835                     | 5,234                       | 399                             | 8.3%                      |
| 25.3 Purchase of goods and services from<br>government accounts             | 47,322                    | 51,494                      | 4,172                           | 8.8%                      |
| 25.4 Operation and maintenance of facilities                                | 61                        | 65                          | 4                               | 6.6%                      |
| 25.5 Research and development contracts                                     | 1,250                     | 8,367                       | 7,117                           | 569.4%                    |
| 25.6 Medical care   | 279                       | 303                         | 24                              | 8.6%                      |
| 25.7 Operation and maintenance of equipment                                 | 658                       | 714                         | 56                              | 8.5%                      |
| 25.8 Subsistence and support of persons                                     | 0                         | 0                           | 0                               | 0.0%                      |
| <b>25.0 Subtotal, Other Contractual Services</b>                            | <b>\$56,312</b>           | <b>\$68,068</b>             | <b>\$11,756</b>                 | <b>20.9%</b>              |
| 26.0 Supplies and materials   | \$6,173                   | \$6,707                     | \$534                           | 8.7%                      |
| 31.0 Equipment  | 1,713                     | 1,862                       | 149                             | 8.7%                      |
| 32.0 Land and structures  | 0                         | 0                           | 0                               | 0.0%                      |
| 33.0 Investments and loans  | 0                         | 0                           | 0                               | 0.0%                      |
| 41.0 Grants, subsidies and contributions                                    | 312,401                   | 306,976                     | (5,425)                         | -1.7%                     |
| 42.0 Insurance claims and indemnities                                       | 0                         | 0                           | 0                               | 0.0%                      |
| 43.0 Interest and dividends   | 0                         | 0                           | 0                               | 0.0%                      |
| 44.0 Refunds  | 0                         | 0                           | 0                               | 0.0%                      |
| <b>Subtotal, Non-Pay Costs</b>  | <b>\$378,189</b>          | <b>\$385,331</b>            | <b>\$7,142</b>                  | <b>1.9%</b>               |
| <b>Total Budget Authority by Object</b>                                     | <b>\$413,009</b>          | <b>\$420,369</b>            | <b>\$7,360</b>                  | <b>1.8%</b>               |

Includes FTEs which are reimbursed from the NIH Common Fund for Medical Research

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

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

| OBJECT CLASSES  | FY 2010<br>Actual | FY 2012<br>PB   | Increase or<br>Decrease | Percent<br>Change |
|---|-------------------|-----------------|-------------------------|-------------------|
| <b>Personnel Compensation:</b>                                |                   |                 |                         |                   |
| Full-time permanent (11.1)                                    | \$13,361          | \$13,461        | \$100                   | 0.7%              |
| Other than full-time permanent (11.3)                         | 9,838             | 9,879           | 41                      | 0.4%              |
| Other personnel compensation (11.5)                           | 670               | 675             | 5                       | 0.7%              |
| Military personnel (11.7)                                     | 477               | 497             | 20                      | 4.2%              |
| Special personnel services payments (11.8)                    | 3,500             | 3,510           | 10                      | 0.3%              |
| <b>Total Personnel Compensation (11.9)</b>                    | <b>\$27,846</b>   | <b>\$28,022</b> | <b>\$176</b>            | <b>0.6%</b>       |
| Civilian personnel benefits (12.1)                            | \$6,691           | \$6,733         | \$42                    | 0.6%              |
| Military personnel benefits (12.2)                            | 283               | 283             | 0                       | 0.0%              |
| Benefits to former personnel (13.0)                           | 0                 | 0               | 0                       | 0.0%              |
| <b>Subtotal, Pay Costs</b>                                    | <b>\$34,820</b>   | <b>\$35,038</b> | <b>\$218</b>            | <b>0.6%</b>       |
| Travel (21.0)   | \$745             | \$807           | \$62                    | 8.3%              |
| Transportation of things (22.0)                               | 135               | 146             | 11                      | 8.1%              |
| Rental payments to others (23.2)                              | 0                 | 0               | 0                       | 0.0%              |
| Communications, utilities and<br>miscellaneous charges (23.3) | 522               | 564             | 42                      | 8.0%              |
| Printing and reproduction (24.0)                              | 188               | 201             | 13                      | 6.9%              |
| <b>Other Contractual Services:</b>                            |                   |                 |                         |                   |
| Advisory and assistance services (25.1)                       | 1,907             | 1,891           | (16)                    | -0.8%             |
| Other services (25.2)   | 4,835             | 5,234           | 399                     | 8.3%              |
| Purchases from government accounts (25.3)                     | 35,324            | 36,831          | 1,507                   | 4.3%              |
| Operation and maintenance of facilities (25.4)                | 61                | 65              | 4                       | 6.6%              |
| Operation and maintenance of equipment (25.7)                 | 658               | 714             | 56                      | 8.5%              |
| Subsistence and support of persons (25.8)                     | 0                 | 0               | 0                       | 0.0%              |
| <b>Subtotal Other Contractual Services</b>                    | <b>\$42,785</b>   | <b>\$44,735</b> | <b>\$1,950</b>          | <b>4.6%</b>       |
| Supplies and materials (26.0)                                 | \$6,167           | \$6,701         | \$534                   | 8.7%              |
| <b>Subtotal, Non-Pay Costs</b>                                | <b>\$50,542</b>   | <b>\$53,154</b> | <b>\$2,612</b>          | <b>5.2%</b>       |
| <b>Total, Administrative Costs</b>                            | <b>\$85,362</b>   | <b>\$88,192</b> | <b>\$2,830</b>          | <b>3.3%</b>       |

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

**Details of Full-Time Equivalent Employment (FTEs)**

| OFFICE/DIVISION  | FY 2010<br>Actual |          |            | FY 2011<br>CR |          |            | FY 2012<br>PB |          |            |
|--|-------------------|----------|------------|---------------|----------|------------|---------------|----------|------------|
|  | Civilian          | Military | Total      | Civilian      | Military | Total      | Civilian      | Military | Total      |
| Office of the Director   | 6                 | 1        | 7          | 6             | 1        | 7          | 6             | 1        | 7          |
| Office of Administrative Management  | 14                |          | 14         | 14            |          | 14         | 14            |          | 14         |
| Office of Information Technology   | 7                 |          | 7          | 7             |          | 7          | 7             |          | 7          |
| Office of Science Policy and Analysis  | 8                 |          | 8          | 8             |          | 8          | 8             |          | 8          |
| Office of Communications and Health Education                                    | 6                 |          | 6          | 5             |          | 5          | 5             |          | 5          |
| Division of Intramural Research  | 155               | 2        | 157        | 157           | 1        | 158        | 157           | 1        | 158        |
| Division of Extramural Activities  | 18                | 1        | 19         | 18            | 1        | 19         | 18            | 1        | 19         |
| Division of Extramural Research  | 22                |          | 22         | 23            |          | 23         | 23            |          | 23         |
| <b>Total</b>   | <b>236</b>        | <b>4</b> | <b>240</b> | <b>238</b>    | <b>3</b> | <b>241</b> | <b>238</b>    | <b>3</b> | <b>241</b> |
| Includes FTEs which are reimbursed from the NIH Common Fund for Medical Research |                   |          |            |               |          |            |               |          |            |
| FTEs supported by funds from   |                   |          |            |               |          |            |               |          |            |
| Cooperative Research and   |                   |          |            |               |          |            |               |          |            |
| Development Agreements   |                   |          |            |               |          |            |               |          |            |
|  | 0                 | 0        |            |               |          |            |               |          | 0          |
| FISCAL YEAR  | Average GS Grade  |          |            |               |          |            |               |          |            |
| 2008   | 11.2              |          |            |               |          |            |               |          |            |
| 2009   | 11.3              |          |            |               |          |            |               |          |            |
| 2010   | 11.4              |          |            |               |          |            |               |          |            |
| 2011   | 11.3              |          |            |               |          |            |               |          |            |
| 2012   | 11.3              |          |            |               |          |            |               |          |            |

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

**Detail of Positions**

| <b>GRADE</b>  | <b>FY 2010<br/>Actual</b> | <b>FY 2011<br/>CR</b> | <b>FY 2012<br/>PB</b> |
|---|---------------------------|-----------------------|-----------------------|
| Total, ES Positions   | 1                         | 1                     | 1                     |
| Total, ES Salary  | 159,069                   | 159,069               | 159,069               |
| GM/GS-15  | 18                        | 18                    | 18                    |
| GM/GS-14  | 29                        | 29                    | 29                    |
| GM/GS-13  | 19                        | 19                    | 19                    |
| GS-12   | 33                        | 34                    | 34                    |
| GS-11   | 19                        | 19                    | 19                    |
| GS-10   | 1                         | 1                     | 1                     |
| GS-9  | 15                        | 15                    | 15                    |
| GS-8  | 8                         | 8                     | 8                     |
| GS-7  | 10                        | 10                    | 9                     |
| GS-6  | 6                         | 6                     | 6                     |
| GS-5  | 5                         | 5                     | 5                     |
| GS-4  | 0                         | 1                     | 1                     |
| GS-3  | 0                         | 0                     | 0                     |
| GS-2  | 1                         | 1                     | 1                     |
| GS-1  | 0                         | 1                     | 1                     |
| Subtotal  | 164                       | 167                   | 166                   |
| Grades established by Act of<br>July 1, 1944 (42 U.S.C. 207): |                           |                       |                       |
| Assistant Surgeon General                                     | 1                         | 1                     | 1                     |
| Director Grade  | 2                         | 2                     | 2                     |
| Senior Grade  | 0                         | 0                     | 0                     |
| Full Grade  | 0                         | 0                     | 0                     |
| Senior Assistant Grade  | 0                         | 0                     | 0                     |
| Assistant Grade   | 0                         | 0                     | 0                     |
| Subtotal  | 3                         | 3                     | 3                     |
| Ungraded  | 77                        | 80                    | 80                    |
| Total permanent positions                                     | 162                       | 168                   | 168                   |
| Total positions, end of year                                  | 245                       | 250                   | 250                   |
| Total full-time equivalent (FTE)<br>employment, end of year   | 240                       | 241                   | 241                   |
| Average ES salary   | 159,069                   | 159,069               | 159,069               |
| Average GM/GS grade   | 11.4                      | 11.3                  | 11.3                  |
| Average GM/GS salary  | 90,835                    | 90,700                | 90,700                |

Includes FTEs which are reimbursed from the NIH Common Fund for Medical Research.