NATIONAL INSTITUTES OF HEALTH
National Eye Institute
Organizational Chart

Office of the Director
Dr. Santa Tumminia
Acting Director

Dr. Mary Frances Cotch
Acting Deputy Director

Brian G. Trent
Executive Officer

Division of Intramural Research
Dr. David Schneeweis
Acting Director

Office of the Clinical Director
Dr. Brian Brooks
Director

Division of Epidemiology and Clinical Application
Dr. Emily Chew
Director

Division of Extramural Science Programs
Dr. Michael Steinmetz
Director

Division of Extramural Activities
Dr. Anne Schaffner
Acting Director
NATIONAL INSTITUTES OF HEALTH

National Eye Institute

For carrying out section 301 and title IV of the PHS Act with respect to eye diseases and visual disorders, [$824,090,000]$749,003,000.
## NATIONAL INSTITUTES OF HEALTH
### National Eye Institute

### Amounts Available for Obligation¹

(Dollars in Thousands)

<table>
<thead>
<tr>
<th>Source of Funding</th>
<th>FY 2019 Final</th>
<th>FY 2020 Enacted</th>
<th>FY 2021 President’s Budget</th>
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<tbody>
<tr>
<td>Appropriation</td>
<td>$796,536</td>
<td>$824,090</td>
<td>$749,003</td>
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<tr>
<td>Mandatory Appropriation: (non-add)</td>
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<td><em>Type 1 Diabetes</em></td>
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<td>(0)</td>
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<td>Rescission</td>
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<td>Sequestration</td>
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<tr>
<td>Secretary's Transfer</td>
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<td>$749,003</td>
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<td>OAR HIV/AIDS Transfers</td>
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<td>HEAL Transfer from NINDS</td>
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<tr>
<td>Subtotal, adjusted budget authority</td>
<td>$793,783</td>
<td>$823,325</td>
<td>$749,003</td>
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<tr>
<td>Unobligated balance, start of year</td>
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<tr>
<td>Unobligated balance, end of year</td>
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<tr>
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<tr>
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<td>Total obligations</td>
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<td>$749,003</td>
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¹ Excludes the following amounts (in thousands) for reimbursable activities carried out by this account:

FY 2019 - $19,548  FY 2020 - $25,100  FY 2021 - $21,500

NEI-4
# Budget Mechanism - Total¹

(Dollars in Thousands)

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<tr>
<th>MECHANISM</th>
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<th>FY 2020 Enacted</th>
<th>FY 2021 President's +/−</th>
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<td>Amount</td>
<td>No.</td>
<td>Amount</td>
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<td>Research Centers in Minority Institutions</td>
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<td>$27,259</td>
<td>42</td>
<td>$27,259</td>
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<td>16,200</td>
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<td>FTPPs</td>
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<td>$12,174</td>
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<td>$43,761</td>
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<td>(0)</td>
<td>(0)</td>
<td>(0)</td>
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<td>Intramural Research</td>
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<td>89,916</td>
<td>183</td>
<td>93,456</td>
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<td>90</td>
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<td>(0)</td>
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<tr>
<td>Construction</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Buildings and Facilities</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total, NEI</td>
<td>257</td>
<td>$793,783</td>
<td>273</td>
<td>$823,325</td>
</tr>
</tbody>
</table>

¹ All items in italics and brackets are non-add entries.
Major Changes in the Fiscal Year 2021 President’s Budget Request

Major changes by budget mechanism and/or budget detail are briefly described below. Note that there may be overlap between budget mechanisms and activity detail and these highlights will not sum to the total change for the FY 2021 President’s Budget. The FY 2021 President’s Budget for NEI is $749.0 million, a decrease of $74.3 million from the FY 2020 Enacted level.

**Research Project Grants (RPGs) (-$53.9 million; total $485.6 million):**
NEI will reduce funding for Non-Competing RPGs by 7.0 percent, which is a $25.2 million decrease from their FY 2020 Enacted level. The number of Competing RPGs is expected to decrease by 10.6 percent, or 39 grants compared to the FY 2020 Enacted level of 368 awards, and the amount to support competing awards will be reduced by $25.1 million from FY 2020, or 16.7 percent. These reductions are distributed across all programmatic areas and basic, translational or clinical research.

**Research Centers (-$2.5 million; total $24.9 million):**
NEI will reduce funding for Research Centers by 9.0 percent, resulting in 4 fewer awards.

**Other Research (-$6.9 million; total $69.8 million):**
NEI will reduce funding for Other Research mechanisms by 9.0 percent. Research Careers are expected to decrease by 9.0 percent, or 9 grants compared to the FY 2020 Enacted level of 104 awards. Cooperative Clinical Research is expected to decrease by 9.0 percent resulting in 3 fewer awards.

**Intramural Research (-$8.6 million; total $84.9 million):**
NEI will reduce funding for Intramural Research by 9.2 percent, which is a $8.6 million decrease from the FY 2020 Enacted level. These reductions are distributed across all programmatic areas and basic, translational or clinical research.
## Summary of Changes

(Dollars in Thousands)

<table>
<thead>
<tr>
<th>FY 2020 Enacted</th>
<th>FY 2021 President's Budget</th>
<th>Net change</th>
</tr>
</thead>
<tbody>
<tr>
<td>$823,325</td>
<td>$749,003</td>
<td>-$74,322</td>
</tr>
</tbody>
</table>

### CHANGES

#### A. Built-in:

1. **Intramural Research:**
   - a. Annualization of January 2020 pay increase & benefits: $36,887, $242
   - b. January FY 2021 pay increase & benefits: 36,887, 546
   - c. Paid days adjustment: 36,887, -139
   - d. Differences attributable to change in FTE: 36,887, 0
   - e. Payment for centrally furnished services: 12,497, -2,134
   - f. Cost of laboratory supplies, materials, other expenses, and non-recurring costs: 35,513, 467

   **Subtotal:** -$1,017

2. **Research Management and Support:**
   - a. Annualization of January 2020 pay increase & benefits: $16,204, $106
   - b. January FY 2021 pay increase & benefits: 16,204, 238
   - c. Paid days adjustment: 16,204, -61
   - d. Differences attributable to change in FTE: 16,204, 0
   - e. Payment for centrally furnished services: 3,506, -619
   - f. Cost of laboratory supplies, materials, other expenses, and non-recurring costs: 9,149, 102

   **Subtotal:** -$233

**Subtotal, Built-in:** -$1,250

#### B. Program:

<table>
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<tr>
<th>No.</th>
<th>Amount</th>
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<tbody>
<tr>
<td>1</td>
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<td>-61 -$26,539</td>
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<tr>
<td>2</td>
<td>$124,928</td>
<td>-39 -$25,081</td>
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<tr>
<td>3</td>
<td>23,241</td>
<td>0</td>
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<tr>
<td>4</td>
<td>69,785</td>
<td>-15 -$6,902</td>
</tr>
<tr>
<td>5</td>
<td>485,582</td>
<td>-105 -$53,890</td>
</tr>
<tr>
<td>6</td>
<td>42,771</td>
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<td>7</td>
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<td>8</td>
<td>42,771</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>42,771</td>
<td>0</td>
</tr>
<tr>
<td>Subtotal, Program</td>
<td>$635,248</td>
<td>-$64,248</td>
</tr>
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</table>

**Subtotal, Extramural:**

<table>
<thead>
<tr>
<th>FTEs</th>
<th>Amount</th>
<th>FTEs</th>
<th>Amount</th>
</tr>
</thead>
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<tr>
<td>1,189</td>
<td>$485,582</td>
<td>-105</td>
<td>-$53,890</td>
</tr>
<tr>
<td>38</td>
<td>$24,936</td>
<td>-4</td>
<td>-$2,466</td>
</tr>
<tr>
<td>162</td>
<td>69,785</td>
<td>-15</td>
<td>-6,902</td>
</tr>
<tr>
<td>245</td>
<td>12,174</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>41</td>
<td>42,771</td>
<td>0</td>
<td>-990</td>
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**Subtotal, Extramural:**

| FTEs | $749,003 | 0 | -$73,072 |

**Total changes:** -$74,322

---

**National Eye Institute**

**FY 2020 Enacted**

**FY 2021 President's Budget**

**Net change**

---

1. **Research Project Grants:**
   - a. Noncompeting: 810, $337,413, -61, -$26,539
   - b. Competing: 329, 124,928, -39, -25,081
   - c. SBIR/STTR: 50, 23,241, 5, -2,271

**Subtotal, RPGs:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>1,189</td>
<td>$485,582</td>
<td>-105 -$53,890</td>
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</table>

2. **Research Centers:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Amount</th>
<th>Change from FY 2020 Enacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>$24,936</td>
<td>-4 -$2,466</td>
</tr>
</tbody>
</table>

3. **Other Research:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Amount</th>
<th>Change from FY 2020 Enacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>162</td>
<td>69,785</td>
<td>-15 -6,902</td>
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4. **Research Training:**

<table>
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<tr>
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<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>245</td>
<td>12,174</td>
<td>0</td>
</tr>
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5. **Research and development contracts:**

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<tr>
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<th>Amount</th>
<th>Change from FY 2020 Enacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>42,771</td>
<td>0</td>
</tr>
</tbody>
</table>

**Subtotal, Extramural:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Amount</th>
<th>Change from FY 2020 Enacted</th>
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</thead>
<tbody>
<tr>
<td>1,189</td>
<td>$485,582</td>
<td>-105 -$53,890</td>
</tr>
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6. **Intramural Research:**

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7. **Research Management and Support:**

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8. **Construction:**

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9. **Buildings and Facilities:**

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<th>Amount</th>
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</thead>
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**Subtotal, Program:**

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<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>273</td>
<td>$749,003</td>
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</table>

**Total changes:** -$74,322
Fiscal Year 2021 Budget Graphs

History of Budget Authority and FTEs:

Distribution by Mechanism:

Change by Selected Mechanisms:
## Budget Authority by Activity¹

(Dollars in Thousands)

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<thead>
<tr>
<th>Extramural Research</th>
<th>FY 2019 Final</th>
<th>FY 2020 Enacted</th>
<th>FY 2021 President's Budget</th>
<th>FY 2021 +/- FY2020</th>
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<tr>
<td></td>
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<td>Amount</td>
<td>FTE</td>
<td>Amount</td>
</tr>
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<td>Sensorimotor Disorders, Visual Processing, and Rehabilitation Research</td>
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<td>-$64,248</td>
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<td>$89,916</td>
<td>183</td>
<td>$93,456</td>
</tr>
<tr>
<td>Research Management &amp; Support</td>
<td>82</td>
<td>$29,281</td>
<td>90</td>
<td>$30,373</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>257</td>
<td>$793,783</td>
<td>273</td>
<td>$823,325</td>
</tr>
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¹Includes FTEs whose payroll obligations are supported by the NIH Common Fund.
### NATIONAL INSTITUTES OF HEALTH
### National Eye Institute

#### Authorizing Legislation

<table>
<thead>
<tr>
<th>Research and Investigation</th>
<th>U.S. Code Citation</th>
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<th>FY 2020 Enacted</th>
<th>2021 Amount Authorized</th>
<th>FY 2021 President's Budget</th>
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| Total, Budget Authority    |                    |                        | $823,325,000    | $749,003,000           |
## NATIONAL INSTITUTES OF HEALTH
### National Eye Institute

### Appropriations History

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¹ Budget Estimate to Congress includes mandatory financing.
Justification of Budget Request

National Eye Institute

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

Budget Authority (BA):

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

Director’s Overview

Eye diseases that lead to blindness, such as age-related macular degeneration (AMD), diabetic retinopathy, and glaucoma, affect millions of Americans of all ages and ethnicities. These and other less common diseases disable productive careers and rob people of their mobility and independence. NEI supports vision research through approximately 1,600 research grants and training awards made to scientists at more than 250 medical centers, hospitals, and universities across 44 states and around the world. NEI also conducts laboratory and patient-oriented research in facilities at NIH.

Treating Vision Loss, Then and Now and Beyond

When looking back 20 years, it may seem like medical advances have transformed vision care at “blinding” speed, but the process of translating discoveries into treatments can take decades. For example, in 1993, NEI researchers discovered RPE65, one of several genes that when mutated causes Leber congenital amaurosis (LCA), a severe form of childhood blindness. It took years of research to understand the connection between the gene and disease, to develop gene therapies and to test them in animal models. Ultimately, these efforts resulted in the first Food and Drug Administration (FDA)-approved gene replacement therapy in 2017 in which a normal copy of RPE65 is introduced to patients. LCA gene replacement demonstrated the proof-of-principle for treating patients with diseases caused by mutated genes, and NEI is funding several other gene therapy studies. The field of gene therapy is once again being transformed, this time by a gene editing technology; instead of introducing a whole new gene, a tool called CRISPR can fix specific gene mutations in the patient’s own DNA. Editas Medicine, a pharmaceutical company specializing in gene editing technology, building on the work of NEI researchers, conducts the first-in-human CRISPR trial to help patients with LCA caused by a mutation in another gene, CEP290, also discovered by NEI scientists.
The long arc of research has paid off in other areas too. Diabetes patients with retinopathy would often lose vision due to leaky abnormal blood vessels in their retina. In the 1980s, laser surgery targeting these vessels dramatically rescued vision in some patients, but also left scar tissue. Twenty-five years later, research on the formation of these vessels led to effective drug therapies that can reverse lost vision in patients. In 2005, optogenetics emerged as a powerful research tool that uses opsins, the light-sensing proteins discovered through vision research. By incorporating opsin proteins into select neurons in research animals, scientists can use light to switch the neurons on and off to understand how those neurons control behavior. More recently, NEI has invested in optogenetics as a therapy to restore vision in cases where the light-sensitive photoreceptors are gone. NEI scientists have inserted these opsin proteins to introduce light-sensitivity in other retinal neurons in blind mice. The teams have been bioengineering faster and more sensitive opsin activity to restore visual functions. By combining optogenetics with other therapies, the future of genetically restoring vision to the blind looks promising.

**Imaging in Four Dimensions and in the Predictable Future**

One of the biggest transformations in eye care over the last 20 years has been imaging the tissues within the eye and identifying biomarkers for earlier disease detection. While the transparent eye has allowed doctors to photograph the retina to look at the health of cells, blood vessels and plaque formation, revolutionary tools such as Optical Coherence Tomography (OCT) now provide 3D cross-sectional images of deep layers of tissue, to examine tissue thickness and leaky blood vessels, which informs treatment decisions in real time. This non-invasive imaging technique can also be used to examine blood vessels running through different areas of the eye (OCT-angiography, OCT-A), which has improved diagnosis of vision and neurologic disease. NEI researchers developed handheld portable OCT-A, which now enables accessible eye imaging for infants and bedridden patients, pre-surgery. The use of adaptive optics—an imaging technology that measures and corrects for light distortions in the eye—paired with OCT yields vivid 3D images of individual cells in living patients, which can be tracked at subsequent patient visits as they respond to treatment. Another powerful new imaging technology is three-photon microscopy, capable of producing high-resolution, non-invasive images deep within ocular tissues. Not only has imaging improved outcomes for visual disorders, but recent research demonstrated that markers in the eye can potentially detect Alzheimer’s Disease before it can be detected in other parts of the nervous system.

With the future in sight, artificial intelligence (AI) is becoming a more useful tool to analyze images and make diagnoses, and NEI funds basic, translational, and clinical AI research across its portfolio. For example, the NEI Small Business program funds clinical studies developing AI and telemedicine tools that can provide early detection and prompt diagnostics for glaucoma, diabetic retinopathy, and retinopathy of prematurity, a significant cause of blindness for very low birthweight premature infants. In 2018, the FDA approved IDx-DR, an AI diagnostic system partly built on NEI-supported research. IDx-DR analyzes retinal images to screen and detect diabetic retinopathy, an important step in managing a disease that causes vision loss in over 30 million Americans. NEI recently funded a clinical study that tested NGoggle, an easy-to-wear device that can assess vision loss by analyzing signals between the brain and eyes. This portable system based on AI and virtual reality can improve diagnostic testing for glaucoma, one of the leading causes of visual impairment in the United States.
The Cutting Edge of Regenerative Medicine

In 2006, the discovery of induced pluripotent stem cells (iPSCs)—adult cells that have been genetically reprogrammed to a developmental stage such that they can be turned into any cell type in the body—revolutionized the field of biomedical and vision research. This breakthrough opened the door for transformative regenerative medicine therapies. The NEI Audacious Goal Initiative (AGI) pioneers regenerative medicine in the retina to restore vision loss due to injury or degenerative disease. Recent increases in the NEI budget have allowed the AGI to expand research opportunities in regenerative medicine, without sacrificing other NEI priority research areas. The AGI has launched three key research consortia, representing 16 highly collaborative projects and $62 million to image individual cells in the eye as they respond to light, identify factors that control cell regeneration in the visual system, and develop animal models to test regenerative therapies. AGI efforts to expand knowledge around cellular environments in the eye is a vital component in the application of regenerative medicine. For example, scientists are excited about a rare subpopulation of retinal cells that respond to light to regulate the sleep-wake cycle because they have the ability to resistant eye injuries, to survive under many disease conditions, and to regenerate. A recent study discovered that a gene found in these cells called thrombospondin-1 plays a vital part in increasing cell regeneration. Further insights into how these cells regenerate may provide valuable insights on how to reduce vision loss following eye diseases.

The ability to turn stem cells into a retinal pigment epithelium (RPE) layer, a sheet of cells in the back of the eye that supports neighboring light-sensing cells, is the foundation for constructing a complete retina. Researchers at NEI were able to derive iPSCs from patients with advanced age-related macular degeneration (AMD) and convert those stem cells into healthy RPE tissue. The newly developed tissue prevented blindness in animal models and lead to the first-in-human clinical trials using replacement tissue derived from iPSCs. In a separate study, the scientists were also able to incorporate 3-D bioprinting to build a network of capillaries to supply blood to the RPE tissue. NEI collaborates with FUJIFILM Cellular Dynamics, Inc., a cell manufacturing company based on NEI-funded research converting stem cells into retinal neurons, to recreate a retina from stem cells entirely in the laboratory. This goal is to develop 3-D ocular tissue and technologies to treat eyes damaged in traumatic injury, such as those of soldiers impacted by a roadside blast.

Investing in Age-Related Macular Degeneration

Although AMD is the leading cause of vision loss in older Americans, and several genes and pathways have been implicated in its development, therapy options have been limited. NEI has capitalized on recent increased appropriations to develop a multipronged strategy for AMD. NEI established the AMD Pathobiology Working Group in 2016 to leverage new genomic discoveries and discuss new methodologies. The Workgroup published a report in July 2019 that assessed the state of knowledge for AMD pathogenesis and provided recommendations to prioritize future research that will expedite the discovery of targeted therapies. Landmark genomics studies have given us genetic footholds (such as the inflammation control gene CFH) to explore new molecular pathways such as the immune system and cholesterol, as well as environmental risks like smoking. New research from Genome Wide Association Studies on AMD compared populations of people with and without AMD and identified 52 genetic variants within 34 genomic regions that were significantly associated with the disease. The publicly available data

NEI-14
provide a valuable resource for vision scientists to unlock information on disease mechanisms associated with these genes and aid in the development of new treatment strategies. Recent findings from a large-scale genetic screening of mice uncovered important genes that are linked to disease mechanisms that affect the eye and revealed important genetic risks associated with diseases like AMD that can have growing impacts on improving diagnostics.

Today, multiple drug options for the ‘wet form’ of AMD block VEGF, a growth factor that stimulates abnormal growth of blood vessels that leak into the retina. These drugs have been remarkably effective in preventing vision loss and even restoring lost vision in many patients. By contrast, there are currently no therapies for the ‘dry’ form of advanced AMD, characterized by the death of photoreceptor cells and underlying RPE cells. Multiple trials for this form of the disease are now underway to replace damaged cells in the back of the eye, such as the NEI trial creating iPSC-derived tissue patches from patients. The Age-Related Eye Disease Studies (AREDS), designed to explore the natural history and risk factors of AMD, demonstrated specific dietary supplements were successful in delaying progression to advanced AMD in roughly one in four patients; detailed imaging and artificial intelligence may hopefully assist doctors in personalizing treatments in the future. In a bold effort to build on the AREDS investment, NEI has partnered with the New York Stem Cell Foundation to facilitate drug discovery and other basic research efforts by creating a database of genetic and clinical information from a cohort of AMD patients along with generating RPE cell lines derived from stem cells from these individuals that will soon be available for the scientific community to use. Separately, a project coinciding with the AMD Ryan Initiative Study, tracking eye health of 200 people with early AMD, will begin to evaluate the effectiveness of a new procedure that measures how the eye adjusts to the dark to help screen and monitor the disease at early to middle stages.

Another new investment in AMD research builds on the very successful Diabetic Retinopathy Clinical Research Retina Network. Originally established in 2004 to partner community clinics with academic research centers for creating a robust diabetic retinopathy research pipeline with efficient infrastructure, the Retina Network has just expanded to cover other retinal conditions, including AMD.

**Beyond 2020 Vision**

In July 2019, Director Paul Sieving, MD, PhD, announced he was leaving NEI after 18 years. Even as a national search is underway to identify a new director, NEI is launching new research initiatives. To help NEI look toward the future of vision research, the NEI Council endorsed a strategic planning process, with significant scientific and community input. The plan will be organized around cross-cutting areas of emphasis in order to capitalize on scientific opportunities enabled by emerging technologies and research needs. To complement the NEI AGI, which focuses on the back of the eye, the newly launched Anterior Segment Initiative (ASI) will prioritize the front of the eye (cornea, dry eye, pain). In November, NEI issued an ASI Request for Information to solicit ideas from researchers, patients, and other vision stakeholders. Recently, NEI researchers published promising results from clinical trials on DNase, an enzyme-based eye-drop used to treat severe dry eye, a disease that has limited drug therapy options and can seriously compromise vision and quality of life if not properly treated. The same researchers
also conducted the first in-human clinical trial on eye drops made from pooled human antibodies to treat patients with dry eye disease by targeting their immune system.

NEI is leveraging partnerships to explore new areas of research. A new partnership between NEI and the Department of Defense initiated in 2019 allows DoD Vision Research Program grant applicants to get concurrent NIH review, enabling NEI to fund research within its mission from a different pool of applicants, often with a greater engineering focus. The Eyes of Africa Project is an international collaborative of researchers that examines the genetic, economic, societal, and personal effects of vision loss in Africa. African Americans have both an increased prevalence of glaucoma and disproportionately higher rate of vision loss. NEI recently supported studies that identified genes related to glaucoma in populations of African descent. NEI’s National Eye Health Education Program (NEHEP) supports population health by educating professionals and the public about the importance of eye health; NEHEP released a new strategic plan in 2019 and will launch a pilot project in 2020 to assess the impact of its outreach to Spanish-speaking audiences.

Overall Budget Policy:
The FY 2021 President’s Budget request is $749.0 million, a decrease of $74.3 million or 9.0 percent compared with the FY 2020 Enacted level.

Program Descriptions and Accomplishments

Retinal Diseases Research: The retina is the light-sensitive neural tissue that lines the inside of the eye and sends visual messages through the optic nerve to the brain. Damage to the retina through disease or retinal detachment can lead to severe vision loss. The goals of this program are to increase the understanding of disease mechanisms that cause vision loss and to develop improved methods of prevention, diagnosis, and treatment. To meet these goals, NEI supports research on the cell biology, physiology, neuroscience, and immunology of the retina. Major areas addressed within the Retina Program include:

- **Age-related Macular Degeneration.** A leading cause of vision loss, AMD is a disease that blurs the sharp, central vision required for reading, driving, and face recognition. There are two forms of advanced AMD: geographic atrophy (“dry”) AMD, a gradual breakdown of light sensing photoreceptor neurons; and neovascular (“wet”) AMD, when abnormal blood vessels grow underneath the retina.

- **Retinopathy.** Diabetic retinopathy is a complication of diabetes in which abnormal blood vessels grow on the surface of the retina and may swell and leak fluid. Retinopathy of Prematurity is a potentially blinding disorder that affects premature infants with very low birthweight.

- **Retinal monogenic disorders.** Some retinal degenerative diseases are caused by single genetic mutations, including retinitis pigmentosa, Usher syndrome, and ocular albinism.

- **Uveitis.** Inflammatory diseases that produce swelling and destroy eye tissue, sometimes leading to severe vision loss.

Accomplishments: Cells in the retina have been classified by their shape and response to light, but new techniques can measure the level of gene expression in individual cells, demonstrating
an incredible diversity of cells previously unknown. Applying big data analytics to this cell atlas enables comparisons of primate retinal cells to other species like mice, and an understanding of what underlies the sharp central vision unique to primates compared to peripheral vision. NEI researchers generated comprehensive classifications of cells in the primate retina and compared them to those of mice to understand the functions of vision. Between central and peripheral retina, 80 percent of the 65 different cell types were the same, but substantial differences in gene expression may underpin the divergent functions. These findings may improve therapy development for diseases like AMD, which is unique to primates.

A paradigm-changing technology, known as OCT, allows doctors to image cross-sections of the eye in patients to inform treatment decisions. OCT-angiography non-invasively images the tiny retina blood vessels which are often impacted by disease. However existing tabletop OCT systems could not be used for bedridden patients, patients undergoing surgery, or infants and children. For these populations, NEI researchers developed a new handheld OCT device and obtained high resolution images from infants to detect precise abnormalities in the retina. Some blinding diseases, like Retinitis pigmentosa, destroy light detecting photoreceptor cells, while initially preserving other cell types. Current retinal prosthesis therapies, such as the FDA-approved Argus II, electrically stimulate these cells to provide rudimentary vision, but sharp resolution has been limited as non-targeted cells are also stimulated. A recent study found that selective activation of retinal ganglion cells using electrodes resulted in an improved ability to enhance cell resolution—a step closer to improving the quality of artificial vision. Optogenetics is a technology that turns light-sensing proteins, opsins, into switches that can be genetically engineered in other retinal cells to make them responsive to light. Researchers were able to utilize medium-wavelength opsins in mammals to restore vision in dim light, which brings promise for human patients to be able to read and use a video monitor instead of relying on adaptive prosthetics to restore light-sensitivities.

NEI supported two recent clinical trials to compare effectiveness of drug therapies for uveitis. The POINT trial found that the delivery of three corticosteroids therapy options directly into the eye resulted in marked improvements to treat uveitis compared to administering around the eyeball. The FAST trial found that two commonly used drugs with differing price points performed similarly in treating the non-infectious form of uveitis. The cheaper drug was also found to be more effective than the more expensive therapy at treating severe forms of uveitis.

Budget Policy: The FY 2021 Budget request is $307.8 million, a decrease of $31.1 million or 9.2 percent compared with the FY 2020 Enacted level.

Corneal Diseases, Cataract, and Glaucoma Research: Corneal diseases, cataracts, and glaucoma cause more visits to ophthalmologists a year than any other vision disorders. NEI supports research to address these conditions that originate in the front of the eye.  
  
- **Corneal disease research.** Corneal injuries, infections, and diseases can be extremely painful and require immediate medical attention. NEI’s corneal research encompasses injuries sustained from recreation and the workplace as well as eye trauma.

- **Cataract research.** Cataracts, a clouding of the lens in the eye that affects vision, are the leading cause of blindness worldwide. NEI researchers investigate strategies to prevent cataract formation and progression through research to understand the physiological basis
of how the lens in the healthy eye remains transparent at the cellular and molecular levels.

- **Glaucoma research.** Glaucoma is a group of blinding diseases that result from damage to the optic nerve, the bundle of fibers that transmit signals from the eyes to the brain. Current therapies focus on reducing excessive fluid pressure in the eye, which causes nerve damage in the most common form of glaucoma.

**Accomplishments:** Recent outbreaks of Zika virus and other flaviviruses have uncovered a significant need to gain a deeper understanding of viral pathogenesis in the eye. A study following 112 infants prenatally exposed to the Zika virus in Brazil confirmed that over 21 percent of them had eye abnormalities, including a few who were born to mothers infected during the third trimester. Research in this area led to new clinical guidelines for the management of children with congenital Zika infection and helps prioritize future investments to develop reliable diagnostic tests and ocular antiviral therapies for flavivirus infections.

A recent analysis on single fiber cells that develop the eye lens helped uncover the diversity of gene expression in ocular lens cells, which may aid in efforts to restore vision issues caused by cataracts. On the global front, a new NEI grant will allow a team of investigators to study cataracts, uveitis, and other ocular complications that persist in Ebola survivors, including those who have cleared the virus from their system, to help find effective treatment and infection control methods for this complex disease.

NEI basic research on a molecular signaling cascade led to the Food and Drug Administration approval, in 2019, of Rocklatan, once-daily eye drops to treat patients with the most common form of glaucoma. This drug complements existing glaucoma medications and patients taking a combination therapy have benefited from their additive effects on eye pressure.

**Budget Policy:** The FY 2021 Budget request is $205.4 million, a decrease of $20.8 million or 9.2 percent compared with the FY 2020 Enacted level. While anterior eye diseases affecting the front of the eye, such as corneal diseases and cataracts, can lead to vision loss in patients at any age, NEI places additional priority on research exploring the impact of aging and environmental factors on conditions such as corneal dysfunction, glaucoma, and cataract formation. Front-of-the-eye research also includes ocular pain, ocular infection, inflammation, and immunology.

**Sensorimotor Disorders, Visual Processing, and Rehabilitation Research:** NEI funds basic and applied brain research, and research on rehabilitation for individuals with low vision. NEI neuroscientists have made remarkable progress in understanding what goes on in the face-processing areas in the brain.

- **Sensorimotor disorders and visual processing research.** Strabismus (misalignment of the eyes) and amblyopia (commonly known as “lazy eye”) are common disorders that develop during childhood. Program goals center on gaining a better understanding of the neuromuscular control of gaze and the development of the visual system in children at high risk for these disorders. Neuroscientists working in vision research seek to understand how the brain processes the visual information that floods our eyes, how neural activity is related to visual perception, and how the visual system interacts with cognitive and motor systems. Additional research is directed at trying to open the so-
called “critical period” and thereby allow some recovery of visual function and stereopsis in adult amblyopia subjects.

- **Refractive errors.** Refractive errors, such as nearsightedness, farsightedness, and astigmatism, are commonly correctable with eye glasses or contact lenses in the United States but remain a tremendous economic and personal burden globally. The major goals of this program are to discover the biochemical pathways that govern eye growth and to uncover the risk factors associated with refractive errors.

- **Rehabilitation research.** Low vision is the term used to describe chronic visual conditions that are not correctable by eye glasses or contact lenses. NEI supports rehabilitation research to improve the quality of life for people with visual impairments by helping them maximize the use of remaining vision and by devising improved aids and strategies to assist those without useful vision.

**Accomplishments:** Twenty years ago, recovery of vision lost due to traumatic brain injury or stroke was not expected. Researchers recently discovered that visual plasticity—the ability to train and rehabilitate vision based on perceptual learning—paired with noninvasive brain stimulation can reduce recovery time and aid in restoring visual function for stroke or brain injury patients, providing insights into more effective blindness rehabilitation interventions.

**Budget Policy:** The FY 2021 Budget request is $122.1 million, a decrease of $12.3 million or 9.2 percent compared with the FY 2020 Enacted level. NEI conducts pediatric clinical studies for strabismus, amblyopia, and refractive error. Interventions for these conditions, as well as low vision and blindness rehabilitation are most effective when introduced at early stages.

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Approximately one third of the human brain is involved in vision processing; much of what we know about brain organization and function is through vision research. A new frontier of remarkable work in this field is creating opportunities for scientists to translate their cutting-edge research into improving quality of life for Americans.

Over the past 20 years, advanced technologies, such as functional magnetic resonance imaging (fMRI), which non-invasively images brain activity based on patterns of blood flow, have allowed investigators to explore the neural mechanisms underlying visual recognition. Recently, researchers used fMRI to shed light on how the human visual system is organized and, on its ability, to develop over time. They discovered that experiences at a young age with unique cartoon characters from Pokémon games created new activations within the visual cortex that resulted in long-lasting brain storage of these images years later. These findings not only provide better insights into how the brain organizes different types of visual information like Pokémon characters, but also highlight the strong and lasting effects of visual plasticity—the brain’s ability to adapt and rewire its connections—during early development, which can inform future research such as work on rehabilitation. Computer models of neural networks have been used to characterize different types visual processing, such as the brain’s ability to quickly recognize an object. A recent study utilized multielectrode recordings of neurons to compare neural activity in primates with computer models for object recognition tasks. They found that recurrent neural network models, those with back-and-forth or feedback connections,
function similarly to the biological circuits and are critical for complex object recognition and challenging tasks. These findings provide a strong premise to guide model development in the future. The trans-NIH Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative is continuing to accelerate the development and application of new technologies in neuroscience and medicine. Nearly 20 percent of BRAIN grantees focus on vision research, and another 20 percent of projects are awarded to current or past NEI grantees. This cross-cutting collaborative allows NEI and the vision research community to integrate their work with other NIH institutes, federal, and non-federal partners to execute novel approaches and discoveries, such as the development of visual prosthetics. The BRAIN Initiative funded the researchers at Second Sight to develop and clinically test a novel visual cortical prosthetic system—the Orion. The prosthetic is currently undergoing clinical trials with the aim to treat patients with blindness caused by certain diseases or traumas. NEI also supports the brain-machine interface (BMI)—a technology used to analyze the transfer of messages across neural circuits—to allow people with spinal cord injuries to move prosthetic limbs via their thought processes. Basic research on the function and interactions of different cortical areas that relate to sight, object recognition, eye movement, decision making, attention, and visual processing allow researchers to develop technologies that can record and use signals that oversee thoughts to activate motor movements. For example, BMI was used to harness a tetraplegic patient’s intraparietal cortex—the part of the brain that is involved with eye movement—to play simple melodies on the piano by analyzing her visual and mental intent and translating those signals to move the fingers of a robot arm.

**Intramural Research:** NEI basic and clinical studies conducted on NIH campus are focused on the cause, prevention, and treatment of eye diseases and vision disorders; cellular and molecular mechanisms of eye development, infectious diseases of the eye; inflammatory and immunological responses; mechanisms of visual perception by the brain; and sensory control of movements.

**Accomplishments:** A recent intramural NEI study discovered that the innate immune system can have a protective effect in slowing retinal degeneration in retinitis pigmentosa but can worsen symptoms in AMD. These findings point to the complexity of the immune system’s ability to have beneficial or harmful effects depending on the disease. It also highlights the need to guide future research in developing therapies that can complement the immune system to treat retinal degeneration.

NEI visual neuroscientists used a novel approach to teach monkeys to recognize arbitrary visual images, which they remembered for months and years. This allowed researchers to explore where and how long-term memories are represented in the brain. The research is part of a larger project that will provide more understanding of how long-term memories are linked to reward-seeking behavior and how that could be used to develop targeted therapeutics for depression.

**Budget Policy:** The FY 2021 Budget request is $84.9 million, a decrease of $8.6 million or 9.2 percent compared with the FY 2020 Enacted level.

**Research Management and Support (RMS):** RMS provides support and essential services to research programs and monitors their budgets. Included in this line item is personnel to carry out leadership and management functions, human resource support, training, travel, purchasing, facilities, budget, planning, information technology, and extramural grant award and management. NEI currently oversees more than 1,600 grants and contracts, including research
project grants, core center grants, research career development awards, cooperative clinical research agreements, training grants, and research and development contracts.

**Accomplishments:** Over the past 20 years, NIH’s clinical center has doubled its clinical footprint, from admitting an average of 3,000 admitted patient visits to now approximately 5,000 visits per year and increasing clinical studies from 25 to 45, which include patients with eye disorders and other clinical focus areas. Over the past two years, NEI has recruited four tenure-track Investigators – all women – doubling its number of women investigators from four to eight. Women now account for almost a third of NEI investigators (8 of 25), up substantially from 17 percent before the recent hires. One of the new hires has the prestigious Earl Stadtman designation, two have been selected as prestigious Lasker Research Scholars, and three are part of the new NIH Distinguished Scholars Program.

**Budget Policy:** The FY 2021 Budget request is $28.9 million, a decrease of $1.5 million or 5.0 percent compared with the FY 2020 Enacted level.
### National Eye Institute

#### Budget Authority by Object Class¹

(Dollars in Thousands)

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<td>11.3 Other Than Full-Time Permanent</td>
<td>12,020</td>
<td>12,068</td>
<td>47</td>
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<tr>
<td>11.5 Other Personnel Compensation</td>
<td>1,374</td>
<td>1,380</td>
<td>5</td>
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<tr>
<td>11.7 Military Personnel</td>
<td>251</td>
<td>258</td>
<td>7</td>
</tr>
<tr>
<td>11.8 Special Personnel Services Payments</td>
<td>5,653</td>
<td>5,675</td>
<td>22</td>
</tr>
<tr>
<td><strong>11.9 Subtotal Personnel Compensation</strong></td>
<td><strong>$40,523</strong></td>
<td><strong>$40,689</strong></td>
<td><strong>$166</strong></td>
</tr>
<tr>
<td>12.1 Civilian Personnel Benefits</td>
<td>11,654</td>
<td>12,105</td>
<td>451</td>
</tr>
<tr>
<td>12.2 Military Personnel Benefits</td>
<td>289</td>
<td>297</td>
<td>8</td>
</tr>
<tr>
<td>13.0 Benefits to Former Personnel</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Subtotal Pay Costs</strong></td>
<td><strong>$52,466</strong></td>
<td><strong>$53,091</strong></td>
<td><strong>$625</strong></td>
</tr>
<tr>
<td>21.0 Travel &amp; Transportation of Persons</td>
<td>1,052</td>
<td>848</td>
<td>-203</td>
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<tr>
<td>22.0 Transportation of Things</td>
<td>116</td>
<td>93</td>
<td>-23</td>
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<tr>
<td>23.2 Rental Payments to Others</td>
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<td>8</td>
<td>-2</td>
</tr>
<tr>
<td>23.3 Communications, Utilities &amp; Misc. Charges</td>
<td>296</td>
<td>241</td>
<td>-55</td>
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<tr>
<td>24.0 Printing &amp; Reproduction</td>
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<td>3</td>
<td>0</td>
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<tr>
<td>25.1 Consulting Services</td>
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<td>77</td>
<td>-16</td>
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<tr>
<td>25.2 Other Services</td>
<td>25,116</td>
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<td>-4,386</td>
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<tr>
<td>25.3 Purchase of goods and services from government accounts</td>
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<td>59,232</td>
<td>-4,266</td>
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<tr>
<td>25.4 Operation &amp; Maintenance of Facilities</td>
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<td>1,980</td>
<td>-480</td>
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<td>25.8 Subsistence &amp; Support of Persons</td>
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<tr>
<td><strong>25.0 Subtotal Other Contractual Services</strong></td>
<td><strong>$106,035</strong></td>
<td><strong>$96,197</strong></td>
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<tr>
<td>26.0 Supplies &amp; Materials</td>
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<td>3,425</td>
<td>-854</td>
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<tr>
<td>31.0 Equipment</td>
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<td>2,614</td>
<td>-714</td>
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<td>32.0 Land and Structures</td>
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<td>0</td>
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<td>33.0 Investments &amp; Loans</td>
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<td>0</td>
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<td>41.0 Grants, Subsidies &amp; Contributions</td>
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<td>592,477</td>
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<td>42.0 Insurance Claims &amp; Indemnities</td>
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<td>43.0 Interest &amp; Dividends</td>
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<td>44.0 Refunds</td>
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<td><strong>Subtotal Non-Pay Costs</strong></td>
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<td><strong>$695,912</strong></td>
<td><strong>-$74,947</strong></td>
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<td><strong>Total Budget Authority by Object Class</strong></td>
<td><strong>$823,325</strong></td>
<td><strong>$749,003</strong></td>
<td><strong>-$74,322</strong></td>
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</tbody>
</table>

¹ Includes FTEs whose payroll obligations are supported by the NIH Common Fund.
# Salaries and Expenses

(Dollars in Thousands)

<table>
<thead>
<tr>
<th>OBJECT CLASSES</th>
<th>FY 2020 Enacted</th>
<th>FY 2021 President's Budget</th>
<th>FY 2021 +/- FY 2020</th>
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</thead>
<tbody>
<tr>
<td><strong>Personnel Compensation</strong></td>
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<td>Full-Time Permanent (11.1)</td>
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<td>$21,309</td>
<td>$84</td>
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<tr>
<td>Other Than Full-Time Permanent (11.3)</td>
<td>12,020</td>
<td>12,068</td>
<td>47</td>
</tr>
<tr>
<td>Other Personnel Compensation (11.5)</td>
<td>1,374</td>
<td>1,380</td>
<td>5</td>
</tr>
<tr>
<td>Military Personnel (11.7)</td>
<td>251</td>
<td>258</td>
<td>7</td>
</tr>
<tr>
<td>Special Personnel Services Payments (11.8)</td>
<td>5,653</td>
<td>5,675</td>
<td>22</td>
</tr>
<tr>
<td><strong>Subtotal Personnel Compensation (11.9)</strong></td>
<td>$40,523</td>
<td>$40,689</td>
<td>$166</td>
</tr>
<tr>
<td>Civilian Personnel Benefits (12.1)</td>
<td>$11,654</td>
<td>$12,105</td>
<td>$451</td>
</tr>
<tr>
<td>Military Personnel Benefits (12.2)</td>
<td>289</td>
<td>297</td>
<td>8</td>
</tr>
<tr>
<td>Benefits to Former Personnel (13.0)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Subtotal Pay Costs</strong></td>
<td>$52,466</td>
<td>$53,091</td>
<td>$625</td>
</tr>
<tr>
<td>Travel &amp; Transportation of Persons (21.0)</td>
<td>$1,052</td>
<td>$848</td>
<td>-$203</td>
</tr>
<tr>
<td>Transportation of Things (22.0)</td>
<td>116</td>
<td>93</td>
<td>-$23</td>
</tr>
<tr>
<td>Rental Payments to Others (23.2)</td>
<td>10</td>
<td>8</td>
<td>-$2</td>
</tr>
<tr>
<td>Communications, Utilities &amp; Misc. Charges (23.3)</td>
<td>296</td>
<td>241</td>
<td>-$55</td>
</tr>
<tr>
<td>Printing &amp; Reproduction (24.0)</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td><strong>Other Contractual Services:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultant Services (25.1)</td>
<td>93</td>
<td>77</td>
<td>-$16</td>
</tr>
<tr>
<td>Other Services (25.2)</td>
<td>25,116</td>
<td>20,730</td>
<td>-$4,386</td>
</tr>
<tr>
<td>Purchases from government accounts (25.3)</td>
<td>42,644</td>
<td>37,254</td>
<td>-$5,390</td>
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<tr>
<td>Operation &amp; Maintenance of Facilities (25.4)</td>
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<td>465</td>
<td>-$129</td>
</tr>
<tr>
<td>Operation &amp; Maintenance of Equipment (25.7)</td>
<td>2,460</td>
<td>1,980</td>
<td>-$480</td>
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<tr>
<td>Subsistence &amp; Support of Persons (25.8)</td>
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<tr>
<td><strong>Subtotal Other Contractual Services</strong></td>
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<td>Supplies &amp; Materials (26.0)</td>
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<td>$3,425</td>
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<tr>
<td><strong>Subtotal Non-Pay Costs</strong></td>
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<td><strong>Total Administrative Costs</strong></td>
<td>$129,140</td>
<td>$118,228</td>
<td>-$10,912</td>
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</table>
**Detail of Full-Time Equivalent Employment (FTE)**

<table>
<thead>
<tr>
<th>OFFICE/DIVISION</th>
<th>FY 2019 Final</th>
<th>FY 2020 Enacted</th>
<th>FY 2021 President’s Budget</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Civilian</td>
<td>Military</td>
<td>Total</td>
</tr>
<tr>
<td>Division of Epidemiology and Clinical Applications</td>
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<td></td>
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<tr>
<td>Direct:</td>
<td>10 - 10</td>
<td></td>
<td>10</td>
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<tr>
<td>Reimbursable:</td>
<td>- - - -</td>
<td></td>
<td>-</td>
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<tr>
<td>Total:</td>
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<td>Division of Extramural Activities</td>
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</tr>
<tr>
<td>Direct:</td>
<td>15 - 15</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Reimbursable:</td>
<td>- - - -</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Total:</td>
<td>15 - 15</td>
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<td>15</td>
</tr>
<tr>
<td>Division of Extramural Science</td>
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<td></td>
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</tr>
<tr>
<td>Direct:</td>
<td>16 - 16</td>
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<td>16</td>
</tr>
<tr>
<td>Reimbursable:</td>
<td>- - - -</td>
<td></td>
<td>-</td>
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<tr>
<td>Total:</td>
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<td>16</td>
</tr>
<tr>
<td>Division of Intramural Research</td>
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<tr>
<td>Reimbursable:</td>
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<td>Total:</td>
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<td>Office of the Director</td>
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<tr>
<td>Direct:</td>
<td>81 - 2</td>
<td></td>
<td>83</td>
</tr>
<tr>
<td>Reimbursable:</td>
<td>- - - -</td>
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<td>-</td>
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<tr>
<td>Total:</td>
<td>81 - 2</td>
<td></td>
<td>83</td>
</tr>
<tr>
<td>Total</td>
<td>255 - 2</td>
<td></td>
<td>257</td>
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</tbody>
</table>

Includes FTEs whose payroll obligations are supported by the NIH Common Fund.

FTEs supported by funds from Cooperative Research and Development Agreements.

<table>
<thead>
<tr>
<th>FISCAL YEAR</th>
<th>Average GS Grade</th>
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</thead>
<tbody>
<tr>
<td>2017</td>
<td>12.4</td>
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<tr>
<td>2018</td>
<td>12.4</td>
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<tr>
<td>2019</td>
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<tr>
<td>2020</td>
<td>12.4</td>
</tr>
<tr>
<td>2021</td>
<td>12.4</td>
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</table>
### NATIONAL INSTITUTES OF HEALTH
#### National Eye Institute

#### Detail of Positions¹

<table>
<thead>
<tr>
<th>GRADE</th>
<th>FY 2019 Final</th>
<th>FY 2020 Enacted</th>
<th>FY 2021 President’s Budget</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total, ES Salary</td>
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<td>197,637</td>
<td>199,179</td>
</tr>
<tr>
<td>GM/GS-15</td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>GM/GS-14</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>GM/GS-13</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>GS-12</td>
<td>35</td>
<td>35</td>
<td>35</td>
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<tr>
<td>GS-11</td>
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<td>25</td>
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</tr>
<tr>
<td>GS-10</td>
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<td>1</td>
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<tr>
<td>GS-9</td>
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<tr>
<td>GS-8</td>
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<td>GS-7</td>
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<tr>
<td>GS-4</td>
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<tr>
<td>GS-3</td>
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<td>GS-2</td>
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<tr>
<td>Subtotal</td>
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<td>Grades established by Act of July 1, 1944 (42 U.S.C. 207)</td>
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<td>Assistant Surgeon General</td>
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<td>187</td>
<td>187</td>
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<tr>
<td>Total positions, end of year</td>
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<td>273</td>
<td>273</td>
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<tr>
<td>Total full-time equivalent (FTE) employment, end of year</td>
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<td>273</td>
<td>273</td>
</tr>
<tr>
<td>Average ES salary</td>
<td>192,254</td>
<td>197,637</td>
<td>199,179</td>
</tr>
<tr>
<td>Average GM/GS grade</td>
<td>12.4</td>
<td>12.4</td>
<td>12.4</td>
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<tr>
<td>Average GM/GS salary</td>
<td>112,045</td>
<td>115,169</td>
<td>116,067</td>
</tr>
</tbody>
</table>

¹ Includes FTEs whose payroll obligations are supported by the NIH Common Fund.