Research, Funding Opportunities, and Grantsmanship for GI Fellows

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Course: “Funding and Grantsmanship for Research and Career Development Activities”
http://grantscourse.columbia.edu/
Topics to be Discussed

- **Types of Awards**
  - Fellowships (F’s), Training grants (T’s), Career Development awards (K’s), Research grants (R’s), Loan Repayment Program

- **Funding Agencies**
  - Federal
    - National Institutes of Health
  - Voluntary Health Organizations, Professional Societies, Foundations

- **Planning & Organizing Career Development and Research Proposals**
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- **Types of Awards**
  - Fellowships (F’s), Training grants (T’s), Career Development awards (K’s), Research grants (R’s), Loan Repayment Program

- **Funding Agencies**
  - Federal
    - National Institutes of Health
  - Voluntary Health Organizations, Professional Societies, Foundations

- **Planning & Organizing Career Development and Research Proposal**
Not All Funding

Opportunities Are the Same

- **Different mission statements**
  - Fellowships, Training grants
  - Career development (K’s)/ Scholar awards
  - Research project (R’s)

- **Different funding**
  - Stipend/Salary
  - Pilot awards
  - Comprehensive research costs

- **Different time frames**
  - Not renewable: 5 years (K’s), 3 years (F’s), 2 years (T’s)
  - Renewable: 4 years-5 years (R01) each competitive period

Types of Awards

- Individual fellowships
- Training grants
- Career transition awards
- Career development awards
- Research grants (R01)
- Cooperative agreements
- Administrative supplements
- Institutional Clinical & Translational Science Award (CTSA)
- Contracts
- Loan Repayment Program

Types of Awards

- Individual fellowships
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# Timeline of Funding for Junior Investigators

<table>
<thead>
<tr>
<th>Medical School</th>
<th>Internship/Residency</th>
<th>Fellowship – Research Years</th>
<th>Instructor/Assistant Professor</th>
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</thead>
<tbody>
<tr>
<td><strong>T35 Training Grant Summer Research between 1st and 2nd Years</strong></td>
<td><strong>Research Support</strong></td>
<td><strong>Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot</strong></td>
<td></td>
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<tr>
<td><strong>Year-long Enhancement Programs MD/PhD Fellowship or Institutional T32</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Post-doc: Institutional Training Grant (NIH-T32)

- Post-docs selected by institution
- Research training in specific area
- Defined number of slots
- Stipend, health fees, tuition, travel
Dept of Medicine/CUMC: NIH Institutional Training Grants

- Multidisciplinary Training in Translational Gastrointestinal and Liver Research [T. Wang (GI)]
- Cancer Biology Training Program (R. Baer)
- Medical Genetics Training Program (A. Christiano)

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Post-doc: Individual Fellowship

Supports specific individual
Stipend, health fees, tuition, travel
NIH: F32

Review criteria:
  - Individual fellow
  - Mentor
  - Research project
  - Research environment

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Post-doc Fellowships (F32s)
Applications, awards, and success rates

Post-doc: Individual Fellowships

Non-government, non-profit agencies

- Voluntary Health Organizations
- Professional Societies
- Private Foundations
Post-doc: Individual Fellowship
- Voluntary Health Organizations, Foundations, Professional Societies -

- **American Association for the Study of Liver Diseases/ Liver Research Fund**
  - Advanced/Transplant Hepatology Fellowship
  - Clinical and Translation Research Award

- **American Cancer Society**
  - Postdoctoral Fellowships

- **American College of Gastroenterology**
  - Clinical Research Award

Post-doc: Individual Fellowship

- Voluntary Health Organizations, Foundations, Professional Societies -

- American Liver Foundation
  - Postdoctoral Research Fellowship Award
- American Philosophical Society
  - Daland Fellowships in Clinical Investigation
- American Society of Clinical Oncology / Conquer Cancer Foundation
  - Young Investigator Award
- Damon Runyon Cancer Research Foundation
  - Damon Runyon Fellowship Award
Timeline of Funding for Junior Investigators

- **T35 Training Grant Summer Research between 1st and 2nd Years**
- **Research Support**
- **Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot**

Medical School | Internship/Residency | Fellowship – Research Years | Instructor/Assistant Professor

**Year-long Enhancement Programs**
- MD/PhD Fellowship or Institutional T32

**Career Transition Award**

NIH: Pathway to Independence Award

- Career Transition Award (K99/R00)
- No citizenship requirement
- Applicants must:
  - Have earned a clinical or research doctorate;
  - Have **no more than 4 years of research experience** since completing the requirements of the doctoral degree
  - Have not been the principal investigator of an NIH research grant (e.g., R01, R03, R21), career development award (e.g., K01, K07, K08, K23, K25), other peer-reviewed NIH or non-NIH research grant over $100,000 direct costs per year, or have been a project leader on a sub-project of a program project (P01) or a center (P50) grant.

1-2 years as a mentored **K award** for “post-docs”
- Funding level is Institute-specific
  - NIDDK, NIA: $75K for salary plus fringe benefits, $25K for research support (+ 8% I.C.)
- 75% effort

3 years as a **Research award** for independent investigators
- Total/year: = $249,000 (salary and research expenses)
  - D.C. + institution’s I.C. rate
- Must have an independent research position
Career Transition Awards

BWF: Career Awards for Medical Scientists

- Supports physician-scientists to bridge advanced postdoctoral/fellowship training and the early years of faculty appointment
- Must hold an M.D., D.D.S., or D.V.M.
- 75% effort to research-related activities
- Funding: $700,000 over five years

- **Postdoctoral/Fellowship Portion:** Years 1 and 2
  Annual Total: $95,000

- **Faculty Portion** of the Award: Years 3-5
  Annual Total: $170,000

Timeline of Funding for Junior Investigators

- T35 Training Grant Summer Research between 1st and 2nd Years
- Research Support
- Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot
- Medical School
- Internship/Residency
- Fellowship – Research Years
- Instructor/Assistant Professor
- Year-long Enhancement Programs MD/PhD Fellowship or Institutional T32
- Career Transition Award
- Individual Mentored K Career Development Award

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Research Career Programs (K)

- Minimum Effort: e.g. 75% (sometimes 50%)
- Research & Career development activities
- Predominantly salary support
  - e.g. NIDDK: $90K, NCI: $100K
- Up to 5 years
- US citizen/permanent resident
- Reduce effort to 50% in last 2 years if PI of NIH research grant
Mentored Clinical Scientist Development Award (K08)

- Support to develop outstanding independent clinician research scientists
- Basic and translational science
Mentored Patient-Oriented Research Career Development Award (K23)

- **Patient-oriented research**: Research conducted with human subjects (or on material of human origin) for which an investigator directly interacts with human subjects

- **Research areas**: (1) Mechanisms of human disease, (2) Therapeutic interventions, (3) Clinical trials, and (4) Development of new technologies

Cancer Prevention, Control, Behavioral, and Population Sciences Career Development Award (K07)

- NCI program
- Support individuals with health professional or science doctoral degrees who are not fully established investigators

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Activity Code</th>
<th>NIH Institute / Center</th>
<th>Number of Applications Reviewed</th>
<th>Number of Applications Awarded</th>
<th>Success Rate²</th>
<th>Total Funding³</th>
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<tbody>
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<td>2013</td>
<td>K23</td>
<td>NCI</td>
<td>34</td>
<td>7</td>
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<td>32</td>
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<td>NIDCR</td>
<td>5</td>
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<td>NIDDK</td>
<td>68</td>
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<td>2013</td>
<td>K23</td>
<td>NINDS</td>
<td>36</td>
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<td>NIAID</td>
<td>30</td>
<td>11</td>
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<td>6</td>
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<tr>
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<td>0</td>
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<td>$0</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NCCAM</td>
<td>8</td>
<td>0</td>
<td>0.0%</td>
<td>$0</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>‡OD Other</td>
<td>1</td>
<td>1</td>
<td>100.0%</td>
<td>$154,601</td>
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<tr>
<td><strong>2013</strong></td>
<td><strong>K23</strong></td>
<td><strong>Activity Total</strong></td>
<td><strong>555</strong></td>
<td><strong>178</strong></td>
<td><strong>32.1%</strong></td>
<td><strong>$28,555,388</strong></td>
</tr>
</tbody>
</table>
Research Career Development/Scholar Programs

- American Cancer Society
  - Mentored Research Scholar Grant
- American College of Gastroenterology
  - Junior Faculty Development Grant
- American Gastroenterological Association Research Foundation
  - Research Scholar Awards
- American Liver Foundation
  - Liver Scholar Award
Research Career Development/Scholar Programs

- **American Society of Clinical Oncology - Conquer Cancer Foundation**
  - Career Development Award

- **Damon Runyon Cancer Research Foundation**
  - Clinical Investigator Award

- **Doris Duke Charitable Foundation**
  - Clinical Scientist Development Award

- **Robert Wood Johnson Foundation**
  - Harold Amos Medical Faculty Development Program
Timeline of Funding for Junior Investigators

- **Medical School**
  - T35 Training Grant
  - Summer Research between 1st and 2nd Years

- **Internship/Residency**
  - Research Support

- **Fellowship – Research Years**
  - Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot

- **Instructor/Assistant Professor**
  - Year-long Enhancement Programs
  - MD/PhD Fellowship or Institutional T32
  - Individual Mentored K Career Development Award
  - Career Transition Award

CTSA Awards: A Home for Clinical and Translational Science

Source: Zerhouni (NIH) [9/06]
Mentored Clinical Scientist Development Program Award (K12)

- Support to an institution for career development experiences for clinicians leading to research independence.

- Institutions recruit and select candidates into their programs

- Candidates must meet the same criteria as for the individual mentored clinical scientist development award.

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Mentored Clinical Scientist Development Program Award (K12)

- CTSA - Clinical and Translational Scientist Award

- TRANSFORM Scholars Mentored Career Development program
[Training and Nurturing Scientists for Research that is Multidisciplinary]

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CUMC Research Training/Didactic Programs

- **Patient-Oriented Research (POR) Master's of Science Program**: Two-year, 30-credit M-SPH degree program of comprehensive didactic training for conducting clinical and translational research.

- **Columbia Summer Research Institute (CSRI)**: 5-week (10 credit) training program in research design and statistical analysis for patient-oriented research.

- **Epidemiology and Population Health Summer Institute (EPIC)**: Dept of Epidemiology's series of week-long, non-credit courses - provides foundational knowledge and applied skills for advancing population health research.

Timeline of NIH Funding for Junior Investigators

- Short term Training
- Research Support
- Fellowship - Research Years
- Instructor/Assistant Professor

Year-long "Enhancement" Programs

Medical School
Internship/Residency
Fellowship - Research Years
Instructor/Assistant Professor

Career Transition Awards
Individual Mentored K Career Development Award

NIH Loan Repayment Program

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NIH’s Extramural Loan Repayment Program

- Up to $35,000 a year towards educational loan debt
- Conduct qualified research activities for at least 50% of their effort (or less than 20 hours per week) for a minimum of 2 years
- Qualifying educational loan debt equals or exceeds 20% of the applicant's institutional base salary
NIH’s Extramural Loan Repayment Program

- May competitively apply for renewal
- Repayments represent taxable income and are paid in addition to loan

Eligibility:
- U.S. citizen/Permanent residence
- Recipient of M.D., Ph.D., D.D.S. D.M.D., or other specified equivalent doctoral degree
NIH’s Extramural Loan Repayment Program

Extramural Programs

- Clinical Research
- Health Disparities Research
- Clinical Researchers from Disadvantaged Backgrounds
- Pediatric Research
- Contraception and Infertility Research

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NIH Extramural Loan Repayment Programs  FY 2012

NIH received 3,100 applications
- 59 percent of the applications were from new applicants
- 50 percent of all applicants were awarded

<table>
<thead>
<tr>
<th>LRP</th>
<th>New</th>
<th></th>
<th>Renewal</th>
<th></th>
<th>Total</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Applications</td>
<td>Awards</td>
<td>Success Rate</td>
<td>Applications</td>
<td>Awards</td>
<td>Success Rate</td>
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<tr>
<td>Clinical Research</td>
<td>959</td>
<td>389</td>
<td>41%</td>
<td>726</td>
<td>493</td>
<td>68%</td>
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<tr>
<td>Pediatric Research</td>
<td>467</td>
<td>168</td>
<td>36%</td>
<td>290</td>
<td>214</td>
<td>74%</td>
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<tr>
<td>Health Disparities Research</td>
<td>338</td>
<td>122</td>
<td>36%</td>
<td>215</td>
<td>120</td>
<td>56%</td>
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<tr>
<td>Clinical Research for Individuals from Disadvantaged Backgrounds</td>
<td>23</td>
<td>9</td>
<td>39%</td>
<td>11</td>
<td>10</td>
<td>91%</td>
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<tr>
<td>Contraception and Infertility Research</td>
<td>48</td>
<td>18</td>
<td>38%</td>
<td>23</td>
<td>11</td>
<td>48%</td>
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<tr>
<td>Total</td>
<td>1,835</td>
<td>706</td>
<td>38%</td>
<td>1,265</td>
<td>848</td>
<td>67%</td>
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</table>

Total 3,100 1,554 50%
## Funding

### New and Renewal by Program

<table>
<thead>
<tr>
<th>LRP</th>
<th>New</th>
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<th>Renewal</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Awards</td>
<td>Funding</td>
<td>Awards</td>
<td>Funding</td>
<td>Awards</td>
<td>Funding</td>
</tr>
<tr>
<td>Pediatric Research</td>
<td>168</td>
<td>$11,560,880</td>
<td>214</td>
<td>$7,480,483</td>
<td>382</td>
<td>$19,041,363</td>
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<tr>
<td>Health Disparities Research</td>
<td>122</td>
<td>$6,108,530</td>
<td>120</td>
<td>$3,826,946</td>
<td>242</td>
<td>$9,935,476</td>
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<tr>
<td>Clinical Research for Individuals from Disadvantaged Backgrounds</td>
<td>9</td>
<td>$624,407</td>
<td>10</td>
<td>$256,179</td>
<td>19</td>
<td>$880,586</td>
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<tr>
<td>Contraception and Infertility Research</td>
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<td>$996,637</td>
<td>11</td>
<td>$289,275</td>
<td>29</td>
<td>$1,285,912</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>706</strong></td>
<td><strong>$42,629,607</strong></td>
<td><strong>848</strong></td>
<td><strong>$28,078,334</strong></td>
<td><strong>1,554</strong></td>
<td><strong>$70,707,941</strong></td>
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</tbody>
</table>
Percent of Total Awards by LRP

- Clinical Research (57%)
- Pediatric Research (25%)
- Health Disparities Research (16%)
- Contraception and Infertility Research (2%)
- Clinical Research for Individuals from Disadvantaged Backgrounds (1%)
LRP: Clinical Research – New Applications -

New Applications for Clinical Research LRP

Source: NIH LRP
Data Accurate as of 03/31/14

http://www.lrp.nih.gov/about_the_programs/clinical.aspx
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LRP: Clinical Research – Renewal Applications -

Renewal Applications for Clinical Research LRP

![Bar chart showing renewal applications and awards from FY08 to FY13](http://www.lrp.nih.gov/about_the_programs/clinical.aspx)

Source: NIH LRP
Data Accurate as of 03/31/14

NIH Career Development Support to Independent Research Funding

- K08/K23 → Independent Grant
- K12 → Independent Grant
- K12 → Independent Grant
- K08/K23 → Independent Grant
- K12 → Independent Grant

R01 Research Award

Independent Investigator

Funds research project
- Salaries of PI and other research personnel
- Supplies, reagents, etc
- Animal costs
- Patient care costs
- Core facilities
- Page charges for publications

Multi-Year (4yrs – 5yrs)
Renewable (e.g. original grant + 2 renewals = 15yrs)

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R01 Research Grant

- Supports a discrete, specified project
- “Comprehensive” funding
- Modular budgets up to $250,000/year
- Multi-year
- Flexibility
- Most of the research that NIH supports is through this funding mechanism
Exploratory/ Developmental Grants (R21)

- Encourages new, exploratory and developmental research projects by providing support for the early stages of project development. Sometimes used for pilot and feasibility studies.

- 2 years of funding

- Budget: $275,000 (Direct Costs) over two years

- Investigator-initiated R21 studies not funded by all Institutes
Small Research Grants (R03)

- Supports, e.g.:
  - Pilot or feasibility studies;
  - Collection of preliminary data
  - Secondary analysis of existing data
  - Small, self-contained research projects
  - Development of new research technology

- 2 years of funding
- Budget: Direct costs up to $50,000/yr
- Not renewable
- Some Institutes only accepts applications in response to their specific funding opportunity announcements

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Topics to be Discussed

- **Types of Awards**
  - Fellowships (F’s), Training grants (T’s), Career Development awards (K’s), Research grants (R’s), Loan Repayment Program

- **Funding Agencies**
  - Federal
    - National Institutes of Health
  - Voluntary Health Organizations, Professional Societies, Foundations

- **Planning & Organizing Career Development and Research Proposal**
Voluntary Health Organizations

- **American Cancer Society**
  - Mentored Training and Career Development Grants
    - Postdoctoral Fellowships
    - Mentored Research Scholar Grant
  - Research Grants for Independent Investigators
    - Research Scholar Grants
  - Professors
    - Research Professor, Clinical Research Professor
  - New Initiatives and Request for Applications
American Liver Foundation
- Postdoctoral Research Fellowship Award
- Liver Scholar Award

Cancer Research Institute, Inc.
- Student Training and Research in Tumor Immunology (STaRT) Grants
- Cancer Research Institute-Irvington Fellowship Program
- Clinic and Laboratory Integration Program (CLIP) Grants
- Investigator Awards
- Cancer Immunotherapy Consortium (CIC)
- Crohn’s & Colitis Foundation of America
  - Student Research Awards (college/graduate/medical)
  - Research Fellowship Awards
  - Career Development Awards
  - Senior Research Awards
  - Scientific Conferences and Workshops

- Damon Runyon Cancer Research Foundation
  - Damon Runyon Fellowship Award
  - Damon Runyon Clinical Investigator Award
  - Damon Runyon Physician-Scientist Training Award
  - Damon Runyon-Rachleff Innovation Award

- Lustgarten Foundation (pancreatic cancer)
Professional Societies

- American Association for the Study of Liver Diseases
  - Advanced/Transplant Hepatology Fellowship Program
  - Career Development Award in Liver Transplantation
  - Sheila Sherlock Clinical and Translational Research Award in Liver Diseases
  - Pinnacle Research Award in Liver Disease
  - Clinical and Translational Research Awards
  - Liver Scholar Awards
  - AASLD/Alpha-1 Foundation Liver Scholars
American College of Gastroenterology
- Junior Faculty Development Grants
- Clinical Research Awards
- Clinical Research Pilot Grants
- “Smaller Programs” Clinical Research Award

American Gastroenterological Association/AGA Research Foundation
- Student Awards
  - Student Research Fellowships
  - Student Abstract Prizes
American Gastroenterological Association/AGA Research Foundation (cont.)

- Career Development Awards
  - Research Scholar Award
  - Esophageal Clinical Research Award
  - Translational or Clinical Research in Liver Disease
  - Elsevier Pilot Research Award
  - Research Award in Digestive Disease
  - Career Development Technology and Innovation Award
  - Junior Investigator Research Award

- Established Investigator Awards
  - Funderburg Research Award in Gastric Cancer
  - Elsevier Pilot Research Awards

- DDW Travel Awards
American Society for Gastrointestinal Endoscopy

- Endoscopic Research Career Development Award
- Endoscopic Research Award
- NYSGE Florence Lefcourt Research Award
Private Foundations

- Kenneth Rainin Foundation
  - Inflammatory Bowel Disease (IBD)
    - Innovator Awards Program
    - Breakthrough Awards Program
- Leona M. and Harry B. Helmsley Charitable Trust
  - IBD and Crohn's Disease
Topics to be Discussed

- **Types of Awards**
  - Fellowships (F’s), Training grants (T’s), Career Development awards (K’s), Research grants (R’s), Loan Repayment Program

- **Funding Agencies**
  - Federal
    - National Institutes of Health
  - Voluntary Health Organizations, Professional Societies, Foundations

- **Planning & Organizing Career Development and Research Proposal**

NIH Career Development (K) Application

- Model for other career development/scholar grant programs supported by voluntary health organizations, private foundations, and professional societies
**Overall Impact** Write a paragraph summarizing the factors that informed your Overall Impact score.
1. **Candidate**

**Strengths**
- 

**Weaknesses**
- 

2. **Career Development Plan/Career Goals & Objectives/Plan to Provide Mentoring**

**Strengths**
- 

**Weaknesses**
- 

3. **Research Plan**

**Strengths**
- 

**Weaknesses**
- 

4. **Mentor(s), Co-Mentor(s), Consultant(s), Collaborator(s)**

**Strengths**
- 

**Weaknesses**
- 

5. **Environment and Institutional Commitment to the Candidate**

**Strengths**
- 

**Weaknesses**
- 

The Candidate

- Candidate’s Background
- Career Goals and Objectives:
  Scientific Biography
- Career Development/Training Activities During Award Period

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Candidate’s Background

- Personal background for this career path
- Other training experiences
  - Masters degree
- Other research experiences
  - MD/PhD, Medical school, Fellowship
- Reasons for basic, clinical, translational, behavioral, multidisciplinary research, relevant publications
Career Goals and Objectives

- Unique expertise/Scientific history
- Skills that are lacking

Short-term Career Goals
- Timeline for funded period

Long-term Career Goals
- Scientific goals
- Mentoring goals
- Networking goals
Career Development/Training
Activities During Award Period

- Review of didactic courses, clinical training, and research experiences to date
- New research skills/ knowledge required
- Identification of training modules required to fill gaps in knowledge in order to reach long term goals
  - Mentors, Courses, Workshops and additional training, Conferences, Communication skills, Grant writing

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- Mentors/Advisory Committee
- Collaborators and Consultants
  - Scientific area per mentor/committee member
  - Schedule of meetings

<table>
<thead>
<tr>
<th>Career Development and Research Training</th>
<th>Mentors and Advisors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Faculty Member</strong></td>
<td><strong>Role</strong></td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Mentor</td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Co-Mentor</td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Advisory Board Member</td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Advisory Board Member</td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Advisory Board Member</td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Collaborator</td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Consultant</td>
</tr>
</tbody>
</table>
Plans and Statements of Mentor and Co-Mentor(s)

- Mentor’s Assessment of the Candidate
- Mentor’s Research and Career Development Plans for the Candidate
- Expectations for Publications
- What Aspect of the Research will the Candidate be Allowed to Take to Start their Own Independent Research Career
Mentor’s Plans for Providing Guidance and Counseling

Plan for Candidate’s Transition from Mentored Stage to Independent Investigator

Candidate’s Additional Responsibilities

Source of Support for Candidate’s Research Project

Previous Experience as a Mentor
Environment and Institutional Commitment to the Candidate

- Description of Institutional Environment

- Institutional Commitment to the Candidate’s Research Career Development
NIH Career Development Support to Independent Research Funding

K08/K23 → Independent Grant

K12 | K23

K12 | K23

K08/K23

K12 → Independent Grant

Number of Scored Applications from First-time Investigators are Dropping

From Established Investigators

From First-time Investigators

+339 Applications

-535 Applications
### Challenging Times for All Researchers

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall success rate for NIH RO1* Proposals</td>
<td>32%</td>
<td>24%</td>
</tr>
<tr>
<td>Success rate on first submission</td>
<td>29%</td>
<td>12%</td>
</tr>
</tbody>
</table>

### Especially for Young Investigators

<table>
<thead>
<tr>
<th></th>
<th>Then 1990</th>
<th>Now 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at first Ro1* grant</td>
<td>39</td>
<td>43</td>
</tr>
<tr>
<td>% of Ro1s* that go to first-time investigators</td>
<td>29%</td>
<td>25%</td>
</tr>
</tbody>
</table>

*RO1 Equivalents: RO1, R29, R37  
Source: National Institutes of Health
Figure 1. Average Age of Principal Investigators with MD, MD-PhD, or PhD at the time of First R01 Equivalent Award from NIH, Fiscal Years 1980 to 2011
“Over the past three decades, we’ve seen profound shifts in the average age at which a principal investigator receives their first R01. During the period from 1980 to 2001, the average age increased nearly 0.3 years per year. Since that time, the average age at first R01 award has leveled off near 42 for PhDs. It is higher for researchers with an MD or an MD/PhD.” [Dr. Sally Rockey, NIH Deputy Director for Extramural Research (2/3/12)]
Age Distribution of NIH RPG Investigators: 1980

Average Age
New R01 Investigator: 37.2

Sources: IMPAC II Current and History Files
Age Distribution of NIH RPG Investigators: 2006

Average Age
New R01 Investigator: 42.2

Sources: IMPAC II Current and History Files
Preliminary Projection of Age Distribution of NIH RPG Investigators: 2020

Sources: IMPAC II Current and History Files and Preliminary Demographic Projection Model
NIH R01 Principal Investigators: Age 36 and Younger / Age 66 and Older

Percent of All Principal Investigators

Fiscal Year

Young, Brilliant and Underfunded

By ANDY HARRIS

We'll never know what medical breakthroughs were missed because young scientists were not provided with resources.

The New York Times

OCT. 2, 2014
A study for the National Bureau of Economic Research from 2005 examined the age at which over 2,000 Nobel Prize winners and other notable scientists in the 20th century came up with the idea that led to their breakthrough. Most were between 35 and 39. Yet the median age of first-time recipients of R01 grants, the most common and sought-after form of N.I.H. funding, is 42, while the median age of all recipients is 52. More people over 65 are funded with research grants than those under age 35.
Early Stage Investigator (ESI)

- Has not been previously been awarded “significant NIH independent research award”
  - Includes R01’s, projects on P01
  - Does not include: R03’s, R21’s, F’s, K’s, loan repayment program
- Within 10 years of terminal research degree/completion of medical residency
  - Extensions permitted
    (family care, additional clinical training)

Early Stage Investigators: NIDDK

For FY 2014 NIDDK is establishing a nominal “payline” for new (Type 1) and renewal or competing continuation (Type 2) R01 applications of 13th percentile. Most R01 applications which have a primary assignment to NIDDK and which request less

establishing a nominal payline for R01 applications submitted by ESIs at the 18th percentile. In addition, when possible and appropriate the full period of support recommended will be awarded.

FY14


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R01-Equivalent grants, New (Type 1)
Success rates, by career stage of investigator

[Graph showing success rates for first-time and established investigators over fiscal years from 1998 to 2013.]
Research Project Grants: Applications, Awards, and Success Rates

[Bar chart showing the trend of applications, awards, and success rates from 1995 to 2013.]
NIH: one round of applications

http://www3.cancer.gov/admin/gab/02gpb/nci_grants_bk.pdf

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Pink Sheet: Reviewers’ Comments
Bell Curve of Reviewer’s Grant Applications

Definitely do not fund

Fine

Great

Definitely fund

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Poor Statistics
Research Resources not Adequately Described
Career Development Plan
not Comprehensive
Figure Caption Font too Small
All Components of the Application are as Strong as Possible
When Preparing an Application:

- Read instructions
- Never assume that reviewers “will know what you mean”
- Refer to literature thoroughly and thoughtfully
- Explicitly state the rationale of the proposed investigation
- Include well-designed tables and figures
- Present an organized, lucid write-up

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Investigator

- Competent
- Enthusiastic
- Thorough
- Professional
Elements of a Good Proposal

- Feasible
- Relevant
- Unique
- Innovative
- Clear
- Brief
- Consistent
Anticipate Questions and Answer them before they are asked
Common Problems with Grant Applications from New Investigators

- Overly ambitious
- Not independent of previous mentor’s research
- Fishing expedition
- Not hypothesis driven
- Descriptive, not mechanistic project
- Unfocussed
- No or insufficient preliminary data
- Unrealistic budget
- Methodologies beyond the expertise of investigator or research team
Good Luck!