How to Become a Cardiovascular Investigator

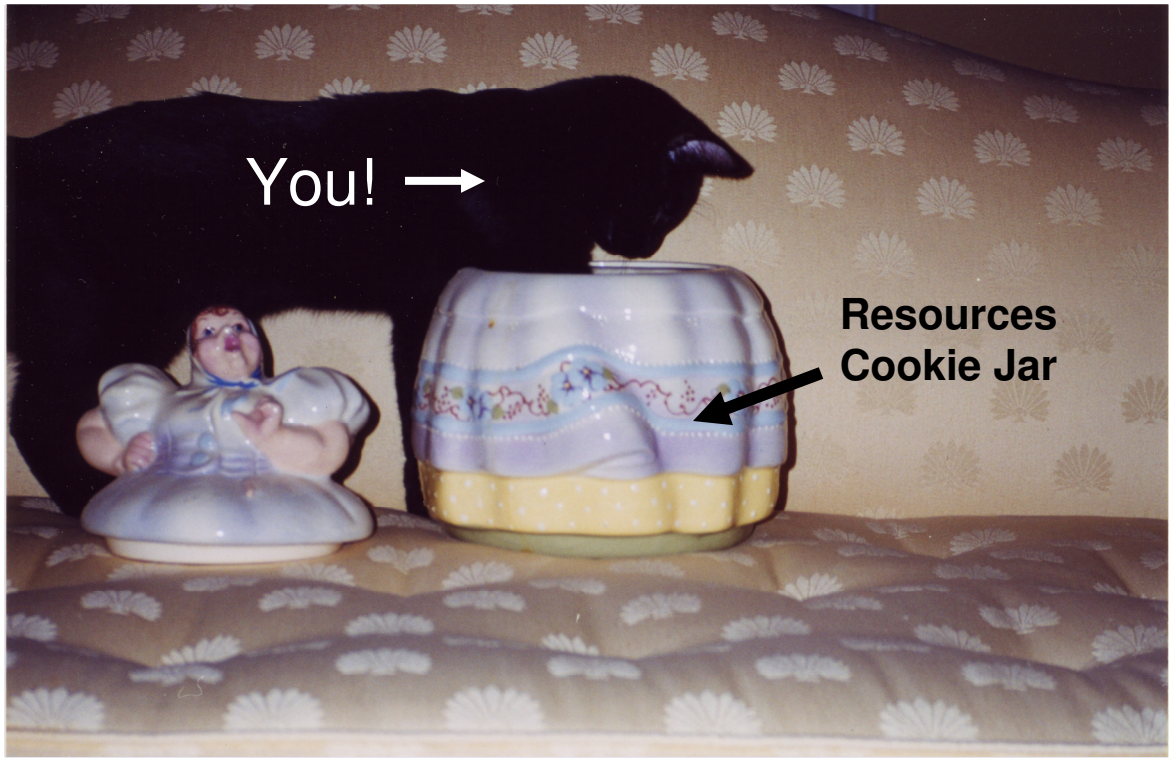
American College of Cardiology

November 9th & 10th, 2007

Washington, DC

Hands (Paws) in the Peer-reviewed Cookie Jar: Funding Opportunities for Cardiovascular Investigators In the Early Stages of Their Career Development

C. William Balke, MD



Outline

- Cardiovascular Investigators In the Early Stages of Their Career Development, a.k.a. "New Investigator"
  - What do we mean by "New"?
  - Why focus on "new" investigators?
  - The Power of "New"
- Metrics for Success: "Currency" for Academic Advancement
- Sources of Support: Help Along the Way
- "Menu" of Major Funding Opportunities
  - NIH
  - VA
  - Other Philanthropies & Foundations
    - AHA
    - ACC

What do we mean by "New"?

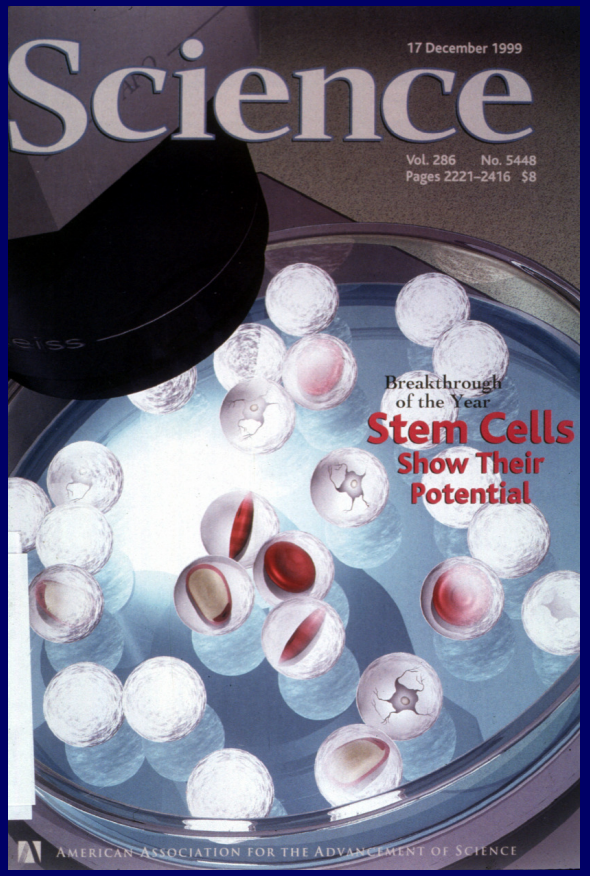
For the purpose of NIH review and funding, applicants are considered new investigators if they have ***not*** previously served as the principal investigators (PI) on any Public Health Service-supported research project other than a small grant (R03), an Academic Research Enhancement Award (R15), an exploratory/developmental grant (R21), or certain mentored research career development awards for persons at the beginning of their research career (K01, K08, K22, K23, K25, K99/R00).

Current or past recipients of Independent Scientist and other non-mentored career awards (K02, K04, K05, K24, and K26) are not considered new investigators.

☑ New Investigator Check Box in the PHS 398.

Why Focus on "New Investigators?"

- NIH-funded researchers are essential to the health of this country's biomedical research enterprise
- NIH is committed to the "pipeline" of new investigators
  - Innovators of the future
  - Fresh ideas and technologies to existing biomedical research problems
  - Pioneer new areas of investigation



The Power of "New"

The NHLBI Commitment to New Investigators

Initial R01 Submission

Separate New Investigator Payline for new (type 1) R01 applications on which all named principal investigators are new investigators.

- The New Investigator payline is 5 percentile points above the regular R01 payline for FY 2007.
- All awards made under this policy will be funded for all years requested.
- New R01 applications on which all named principal investigators are new investigators that are > 5 but ≤ 10 percentile points above the regular R01 payline may undergo an expedited administrative review.

The Power of "New"

The NHLBI Commitment to New Investigators

First R01 Renewal

Separate New Investigator payline for 1st renewal (type 2) R01 applications on which all named principal investigators are new investigators.

- The Payline is 5 percentile points above the regular R01 payline for FY 2007.

The Power of "New"

The NHLBI Commitment to New Investigators

NHLBI RPG Funding Guidelines for FY07

Grant Program	Percentile/Priority Score	Description
R01, R21	14.0	RPG
R01, New Investigator, Initial Submission	24.0	RPG
R01, New Investigator, 1st Renewal	19.0	RPG

Metrics for Success: "Currency" for Career Advancement & Mobility

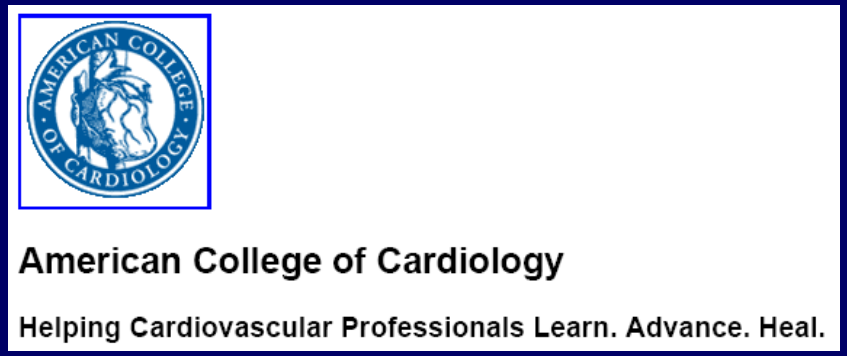
- $ $ $ $ $ $ $ $ $ $ $ $ $
- Research productivity
  - Publications
  - Authorship

Sources of Support: Help Along the Way

Foundations/Philanthropies

- American Heart Association
  http://americanheart.org

- American College of Cardiology
  http://acc.org



Sources of Support: Help Along the Way

- VA Career Development Awards
  http://www.research.va.gov/programs/csrd/career_dev.cfm

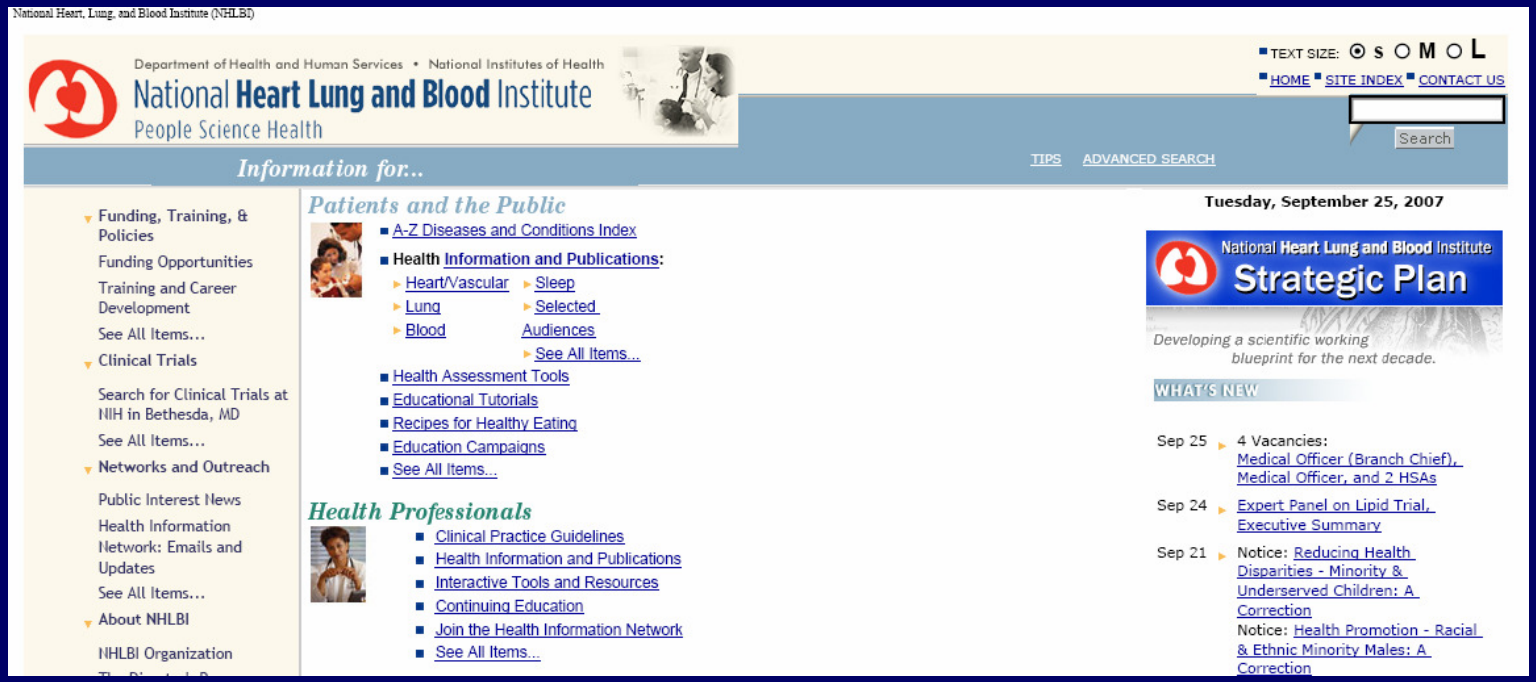
Sources of Support: Help Along the Way

- National Institutes of Health (NIH)
  http://www.nih.gov

Sources of Support: Help Along the Way

- National Heart, Lung and Blood Institute (NIH/NHLBI)

  http://www.nhlbi.nih.gov



Sources of Support: Help Along the Way

- NIH New Investigators Program

  http://grants.nih.gov/grants/new_investigators/index.htm

Sources of Support: Help Along the Way

- K Award Program Announcements – "K Kiosk"
  http://grants.nih.gov/training/careerdevelopmentawards.htm

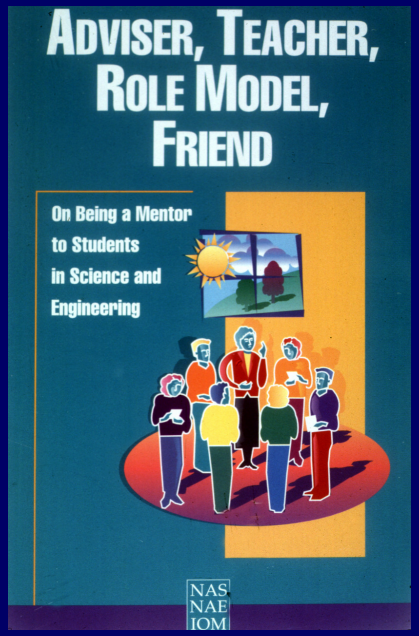
Sources of Support: Help Along the Way

- The Original How to Write a Research Grant Application
  http://www.niaid.nih.gov/ncn/grants/write/index.htm

Sources of Support: Help Along the Way

- Adviser, Teacher, Role Model, Friend:
  On being a Mentor to Students in
  Science and Engineering,
  National Academy Press

  http://www.nap.edu/catalog

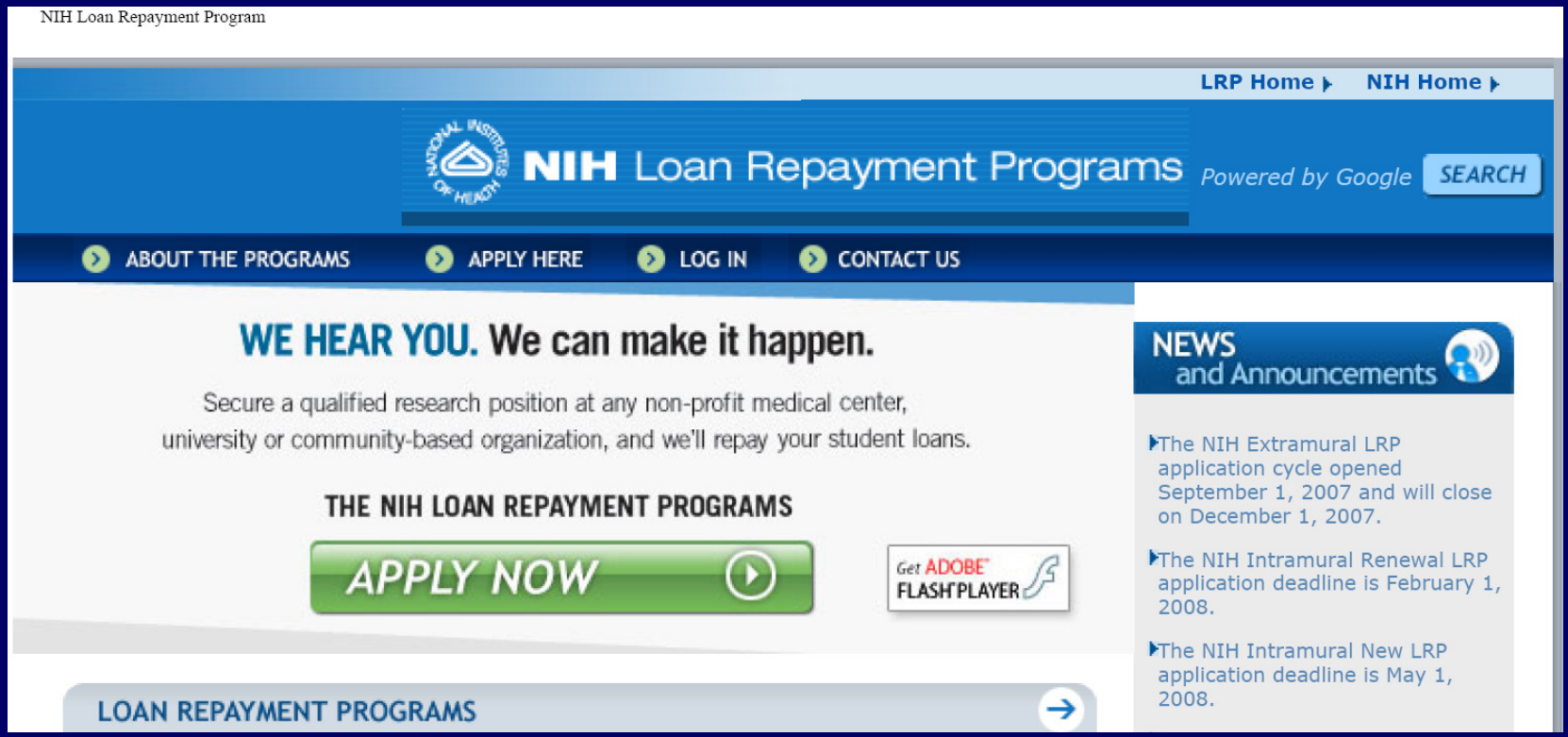


Sources of Support: Help Along the Way

- Mentor(s)
- Institutional CCTS, K12 Award, and former K30 Faculty
- Current Training Grant Awardees
- Agency Program Officer & Study Section Scientific Review Administrator (SRA)
- b.balke@uky.edu

Sources of Support: Help Along the Way

- NIH Loan Repayment Programs
  http://www.lrp.nih.gov



Sources of Support: Help Along the Way

- NIH Loan Repayment Programs

http://www.lrp.nih.gov

  - 5 programs including clinical research & basic/clinical pediatric research programs
  - Eligibility requirements
    - Doctoral-level degree
    - Government research funding (Federal, state or local) or domestic nonprofit research
    - Student loan debt ≥ 20% annual salary
    - US citizenship or permanent residency
    - Non-federal government job

Sources of Support: Help Along the Way

- NIH Loan Repayment Programs

http://www.lrp.nih.gov

  - NIH pays income tax liability
  - Two year award with ability to renew for an additional two year period
  - Maximum payment = $35,000/year

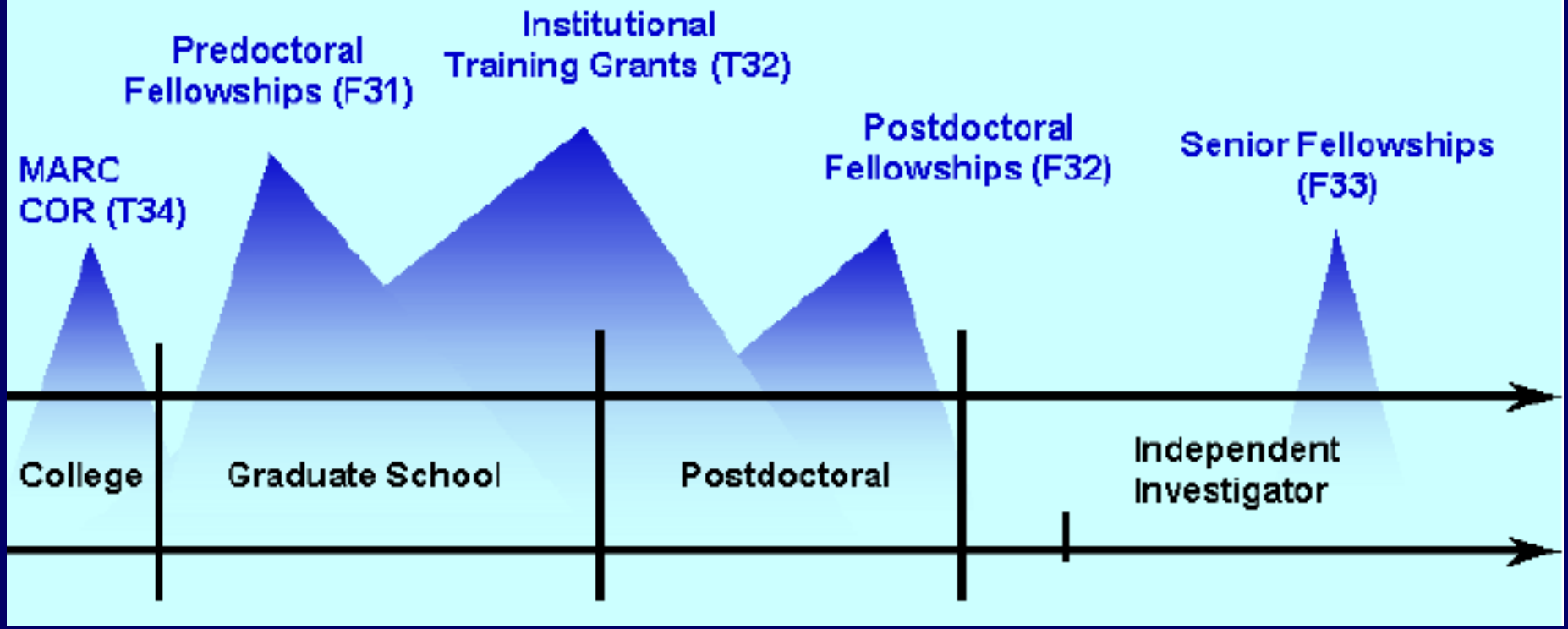
Sources of Support: Help Along the Way

- NIH Loan Repayment Programs

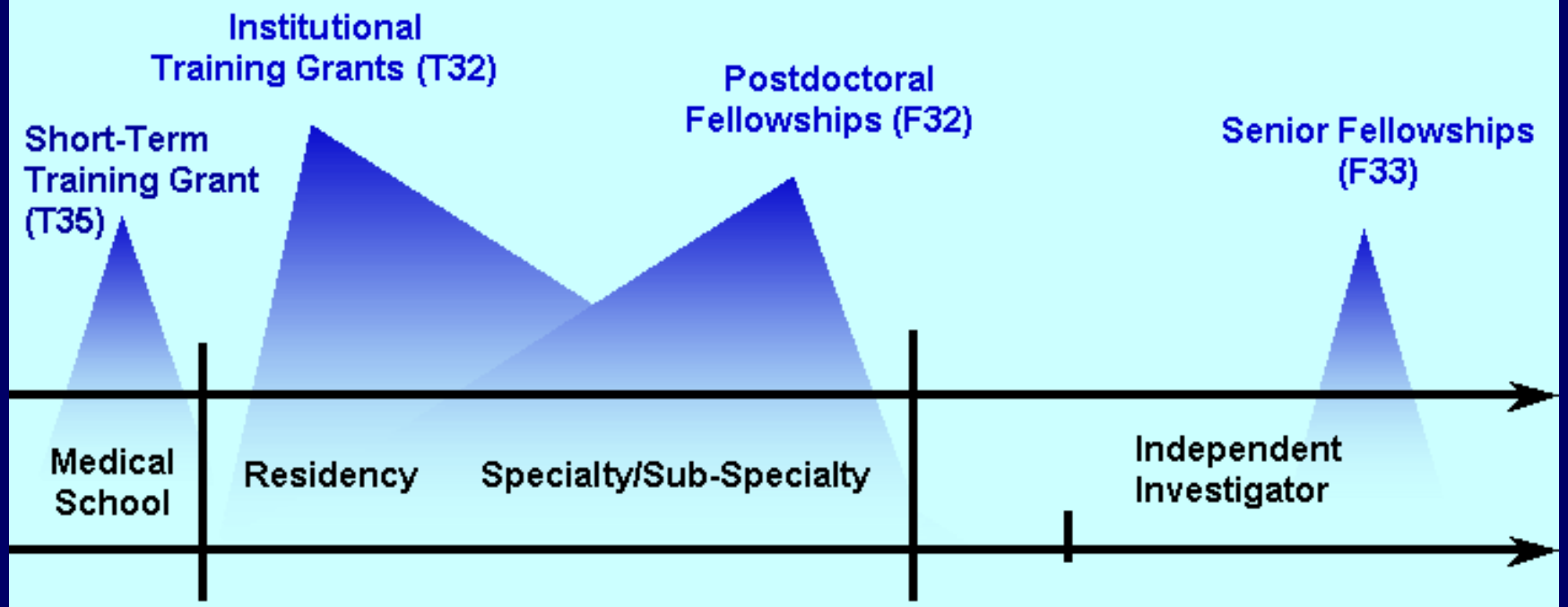
http://www.lrp.nih.gov

  - NIH "Service Obligation": conduct qualifying research supported by a domestic nonprofit or U.S. Government (Federal, state, or local) entity for 50% of time (at least 20 hours per week based on a 40 hour week) for two years. NIH makes quarterly loan repayments concurrent with the participants' satisfaction of their service obligation

NRSA Fellowships and Training Grants (F & T Awards) for Individuals With or Earning a Research Doctorate



NRSA Fellowships and Training Grants (F & T Awards) for Individuals With or Earning a Health-Professional Doctorate



Ruth L. Kirschstein National Research Service Awards (NRSA, a.k.a. F32)

F32 – NRSA - National Research Service Awards:
Postdoctoral training (PhD & MD) within the broad scope of biomedical, behavioral, or clinical research and offering an opportunity to enhance the fellow's understanding of the health-related sciences and extend his/her potential for a productive research career.

The NRSA (F32) is for promising applicants with the potential to become productive, independent investigators in fields related to the mission of the NIH constituent institutes and centers.

NRSA (F32)

Application Receipt Dates (New, renewal, resubmission)
April 8th August 8th December 8th

Stipend **(2007 schedule)**

- $36,996 (0 years since earning degree) to $51,036 (7 or more years of postdoctoral experience) up to three years support

Allowable Costs

- Tuition & Fees: 60% of requested up to $4,500/year
- Institutional Allowance: $7,850/year
- Other training costs with justification: e.g. travel to remote field sites

Payback

- One month of payback for each month of training, up to a maximum of 12 months. This requirement can be fulfilled by teaching or research (a minimum of 20 hours per week) on a continuous basis, beginning within 2 years after support ends.

K Awards Available from NIH

** indicates awards available from National, Heart, Lung and Blood Institute

- K01 Mentored Research Scientist Development Award
  - Career development in a new area of research. 3-5 yrs; Salary determined by sponsoring institution.
- K02 Independent Scientist Award**
  - Develop the career of the funded scientist. 5 yrs; 75% effort.
- K05 Senior Scientist Award
  - For outstanding scientists with a sustained level of high productivity. 5 yrs; 75% effort; Funding determined by the sponsoring institution
- K07 Academic Career Award
  - Developmental/Leadership in academic instruction, research, administration. 2-5 yrs; 25-75% effort; requires institutional sponsorship.

K Awards Available from NIH

** indicates awards available from National, Heart, Lung and Blood Institute

- K08 Mentored Clinical Scientist Development Award**
  - Development of the independent clinical research scientist. 3-5 yrs; 75% effort.
- K18 Career Enhancement Award for Stem Cell Research **
  - Supports full or part-time training in use of human or animal embryonic, adult, or cord blood stem cells. 6 mo – 1 year.
- K22 Career Transition Award **
  - Support to an individual postdoctoral fellow in transition to a faculty position.

K Awards Available from NIH

** indicates awards available from National, Heart, Lung and Blood Institute

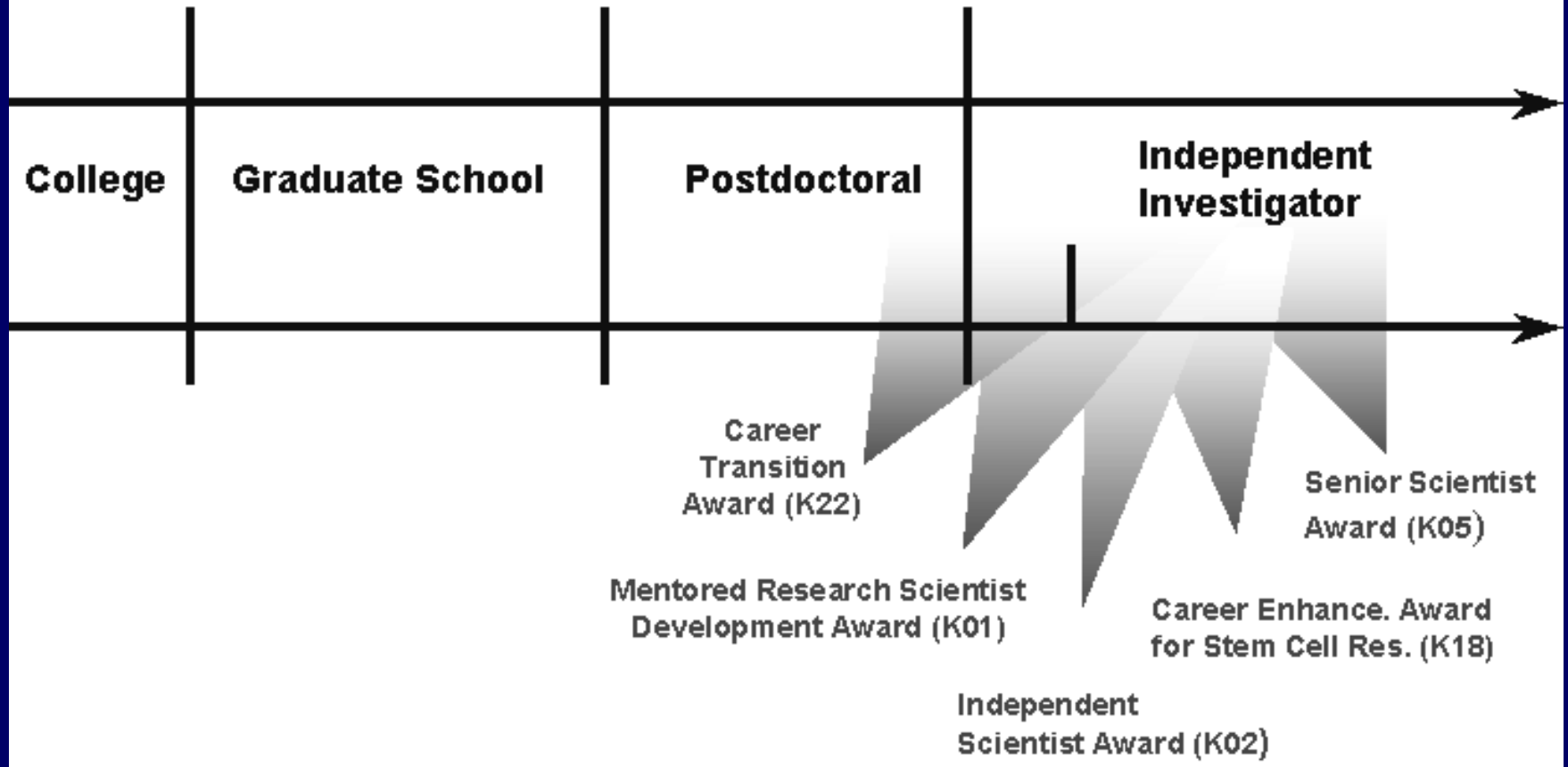
- K23 Mentored Patient Oriented Research Career Development Award **
  - Development of the independent research scientist in the clinical arena. 3-5 yrs; 75% commitment.
- K24 Midcareer Investigator Award in Patient Oriented Research **
  - Development of clinical mentors conducting funded research. 3-5 yrs; 25-50% effort.
- K25 Mentored Quantitative Research Career Development Award **
  - To foster interdisciplinary collaboration in biomedical research by supporting career development experiences for scientists with quantitative and engineering backgrounds. 3-5 yrs; 75% effort.

K Awards Available from NIH

** indicates awards available from National, Heart, Lung and Blood Institute

- K26 Midcareer Investigator Award in Mouse Pathobiology Research
  - Provides support for established pathobiologists who wish to devote up to 50 % of their effort to research and mentoring in the field of mouse pathobiology. 3-5 yrs; renewable; 25-50% effort.
- K30 Clinical Research Curriculum Development
  - Institutional award for development of a clinical research curriculum.
- K12 Mentored Clinical Scientist Development Program Award
  - Support to an institution for the development of independent clinical scientists.
- K99/R00 Pathway to Independence (PI) Award **
  - Provides support for individuals with a terminal clinical or research doctorate degree to facilitate R01 support earlier in their career

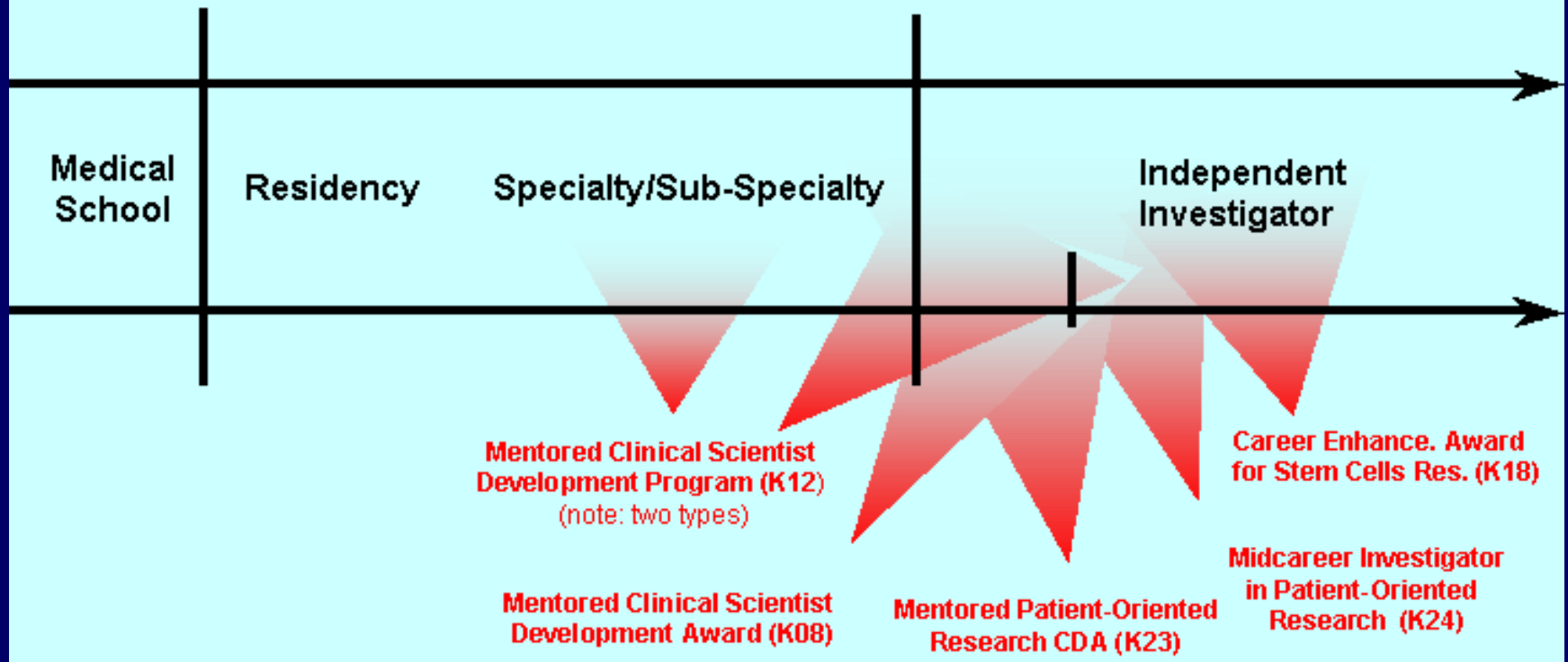
Career Development Awards (K Awards) for Individuals with a Research Doctorate



Note: The following awards are not shown:

- Academic Career Award (K07)
- Mentored Quantitative Research Career Development Award (K25)
- Midcareer Investigator Award in Mouse Pathobiology Research (K26)

Career Development Awards (K Awards) for Individuals with a Health-Professional Doctorate



Note: Individuals with clinical doctorates may also be eligible for awards shown for individuals with research doctorates. The following awards are not shown:

- Academic Career Award (K07)
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Mentored Clinical Scientist Development Award (K08)

The K08 award provides research development opportunities for ***clinical*** scientists with varying degrees of research experience who are committed to developing into independent investigators skilled in advanced methods and experimental approaches needed for cardiovascular research.

The K08 award is intended to provide flexibility in developing a program suited to the experience and capabilities of the candidate.

The K08 supports a three, four or five year period of mentored career development that may integrate didactic studies with ***laboratory or clinically based*** research.

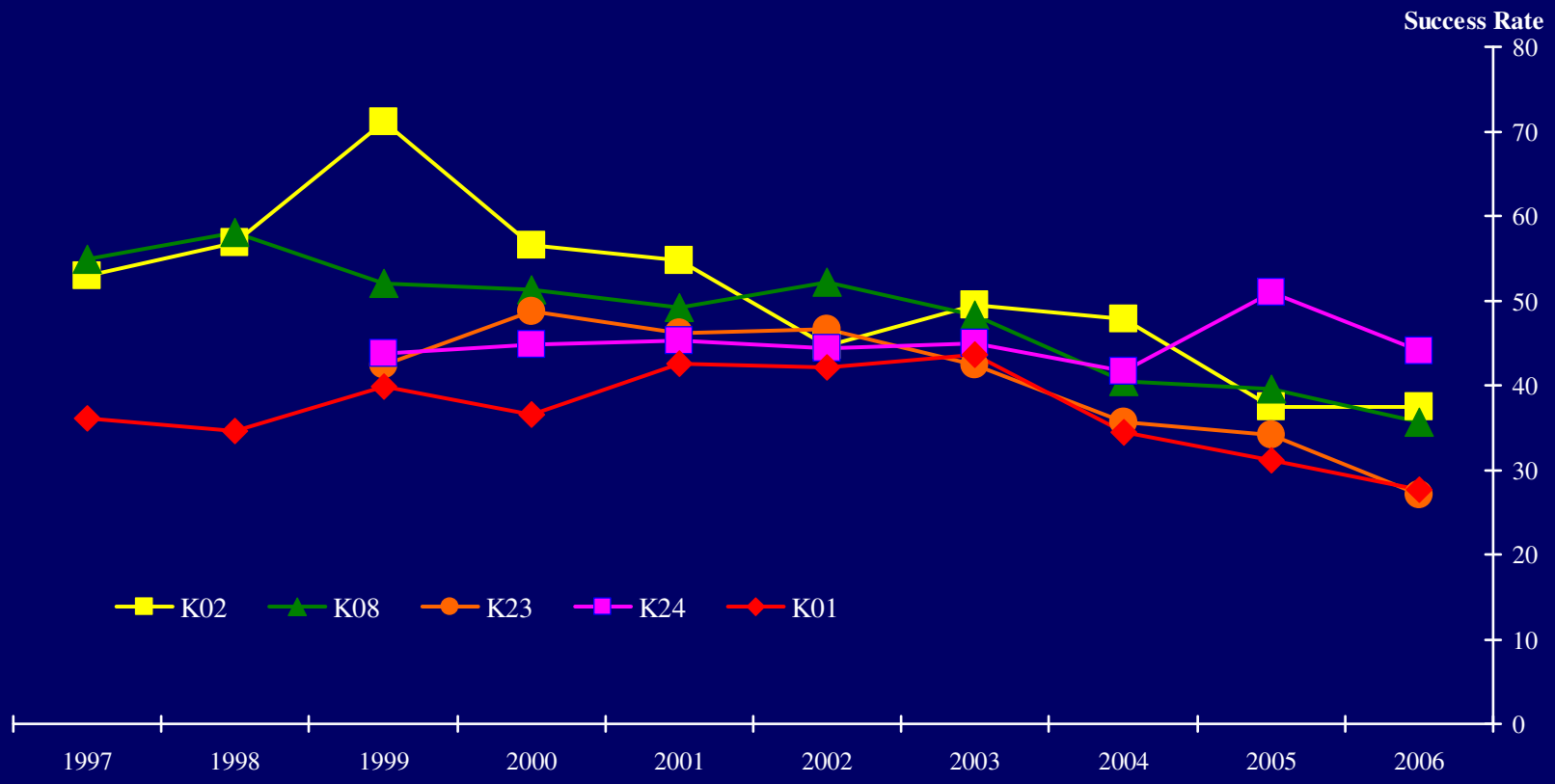
Mentored Patient-Oriented Research Career Development Award (K23)

The K23 award is intended to provide research-oriented clinicians the means to develop independent research skills and gain experience in experimental methods and approaches that will allow them to conduct ***patient-oriented*** research.

The K23 supports a three, four or five year period of mentored career development that may integrate didactic studies with ***patient-oriented*** research.

Patient-oriented research is defined as research conducted with human subjects (or on material of human origin such as tissues, specimens, and cognitive phenomena) for which an investigator directly interacts with human subjects. This area of research includes: 1) mechanisms of human disease; 2) therapeutic interventions; 3) clinical trials, and; 4) the development of new technologies.

Success Rates for Selected K Activities
Fiscal Years 1997 - 2006



K08 & K23 Awards

Eligibility Requirements

- Citizens or non-citizen nationals of the United States
- Permanent Residents (Alien Registration Receipt Card I-551)
- Individuals on temporary or student visas are ***NOT*** eligible.
- Clinical doctoral level degree: M.D., D.O., some Ph.D.s (e.g. nursing, rehabilitation, audiology, clinical psychology, etc.)
- Completion of clinical training (both specialty & subspecialty) at time of award activation
- ***Ineligible***: current & former PIs on NIH R01, FIRST awards (R29), comparable career development awards (K01, K07, K23, etc.), sub-projects of PPG or SCOR grants

K08 & K23 Awards

1. Candidate
2. Career Development Plan
3. Research Plan
4. Mentor
5. Environment & Institutional Commitment
6. Letters of Reference

K08 & K23 Awards

1. Candidate: Candidate's statement

- Qualifications (background)
- K08: Commitment to a career in biomedical research (career goals and objectives); K23: Commitment to a career in patient-oriented research (career goals and objectives)
- Need for further training
- How the award will contribute to the immediate and long-term career objectives
- Clear commitment of 75% of time to proposed research

K08 & K23 Awards

2. Career Development Plan

- Likelihood that it will contribute substantially to the scientific development of the candidate
- Appropriateness of the content and duration of the proposed didactic and research phases of the award
- Consistency with the candidate's career goals and prior research experience
- Quality of the proposed training in the responsible conduct of research
- For individuals with limited or no prior research experience, the didactic component, proposed during the first year or two must be fully integrated into the training program and justified based on their needs.
- Interactions with an internal/external advisory committee

K08 & K23 Awards

3. Research Plan

- Specific aims
- Background & significance
- Preliminary studies
- Research design
  - Scientific soundness
  - Feasibility
  - Potential to achieve the goal of the award

Appropriateness of the project for the candidate at his/her stage of development and as a vehicle to acquire research skills necessary for independence.

Inclusion of plans for the protection of animal and/or human subjects.

K08 & K23 Awards

4. Mentor

- Research qualifications in the area of the project
- Extent and quality of his/her proposed role in guiding and advising the applicant
- Previous experience in training researchers
- History of research productivity and support
- Provisions for internal/external advisory committee
- Protection of at least 75% of candidate's time to proposed research

For more than one mentor, the qualifications, role and commitment of each must be discussed

K08 & K23 Awards

5. Environment and Institutional Commitment

- Specifics of the types of facilities, resources, and training opportunities available to the candidate
- ***A minimum of 75% of full-time effort will be protected for the program***

6. Letters of Reference (3)

K08 & K23 Awards

Application Receipt Dates (New)
February 12th June 12th October 12th

Application Receipt Dates (Renewal, revised, resubmission)
March 12th July 12th November 12th

Salary
- Institute specific
- Generally = ~$75,000 (Legislated maximum salary FY07 = $186,600)

Research Development Support
- Institute specific
- K08: up to ~$25,000/year; K23: up to ~$50,000/year

Facilities and Administrative Costs
- 8%

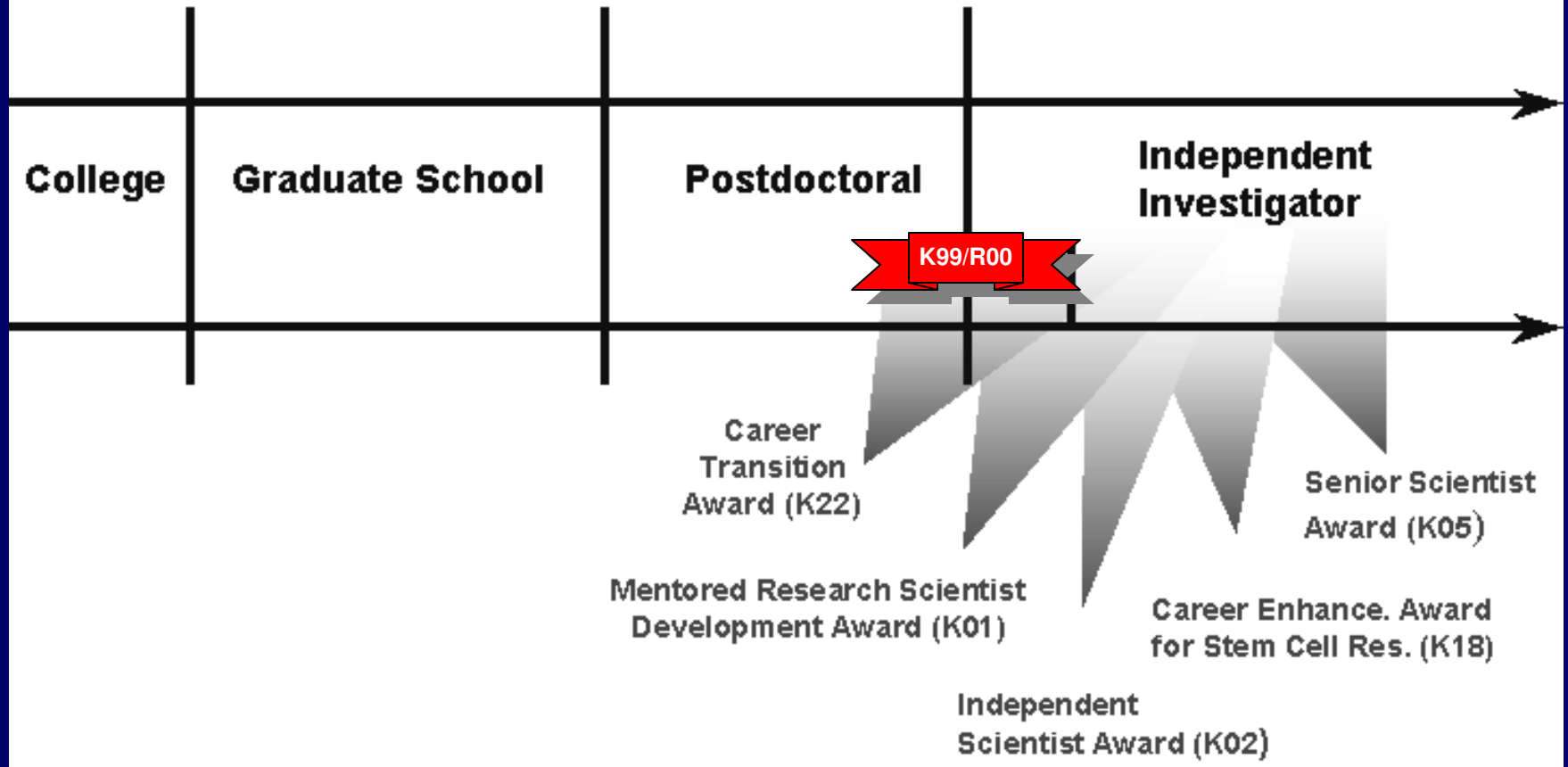
NIH Pathway to Independence (PI) Award (K99/R00)

The K99/R00 Award provides up to five years of support consisting of two phases.

- Mentored Phase (K99): 1-2 years of mentored support for highly promising, postdoctoral research scientists.

- Independent Investigator Phase (R00): Up to 3 years of independent support contingent on securing an independent research position. PI awardees are expected to compete successfully for independent R01 support from the NIH during the career transition award period.

Career Development Awards (K Awards) for Individuals with a Research Doctorate



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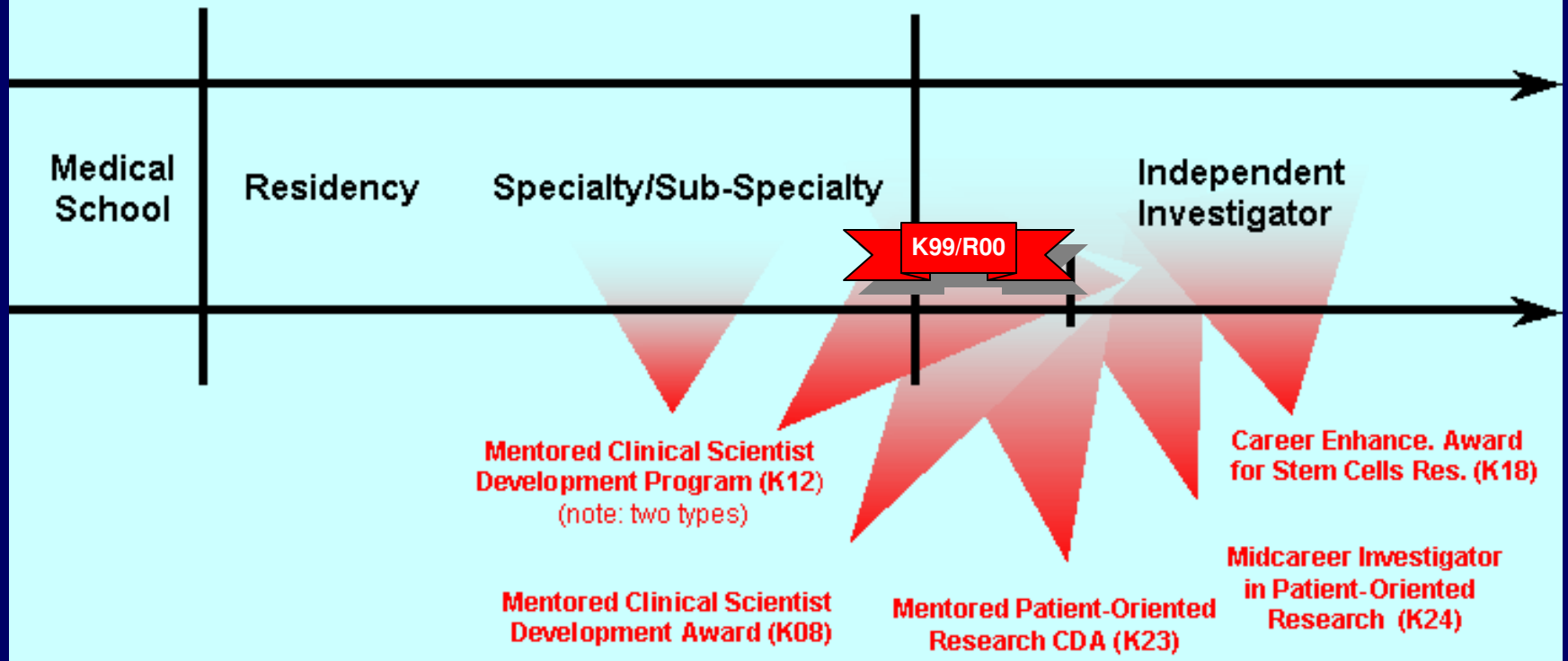

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NIH Pathway to Independence (PI) Award (K99/R00)

Eligibility Requirements

Outstanding postdoctoral candidates who have terminal clinical or research doctorates (including Ph.D., M.D., D.O., D.C., N.D., D.D.S., D.V.M., Sc.D., D.N.S. or equivalent doctoral degrees) who have no more than 5 years of postdoctoral research training at the time of initial application or resubmission(s).

NIH Pathway to Independence (PI) Award (K99/R00)

Application Receipt Dates

February 12th June 12th October 12th

Salary

- Mentored Phase K99 = $50,000 + fringe/year
- Independent Investigator Phase R00 = total of $249,000 per year for salary + fringe, research support, F&A costs

Research Development Support

- Mentored Phase K99 = up to $20,000/year
- Independent Investigator Phase R00 = total of $249,000 per year for salary + fringe, research support, F&A costs

Facilities and Administrative Costs

- Mentored Phase K99 = 8%
- Independent Investigator Phase R00 = total of $249,000 per year for salary + fringe, research support, sponsoring institution's F&A rate

VA Clinical Research Career Development Awards

- Intent: Foster the research careers of clinician scientists who are not yet fully independent but who seek to become independent clinical investigators
- Target applicants: fully trained clinician-scientists who are entering or have recently entered in a career of clinical research
- 3 years of support & renewable for a total of six years of support

AHA Portfolio of Research Programs

- Predoctoral Fellowship
- Postdoctoral Fellowship
- Scientist Development Grant
- Grant-in-Aid
- Fellow-to-Faculty Transition Award
- Beginning Grant-in-Aid
- Established Investigator Grant

AHA Portfolio of Research Programs

- Scientist Development Grant
  - Supports highly promising beginning scientists in their progress toward independence
  - Intent to encourage and adequately fund projects that can serve to bridge the gap between completion of research training and readiness for successful competition as an independent investigator
  - MD, PhD, DO at the rank of junior faculty
  - US citizen; permanent resident; foreign nationals holding: J-1, H-1, H-1B, TC, TN, O-1

AHA Portfolio of Research Programs

- Scientist Development Grant
  - Up to $30,000/year for salary + fringe
  - F&A costs = 10%
  - At least $35,000/year for project support
  - All award may be for project support and F&A costs if salary & fringe not requested

AHA Portfolio of Research Programs

- Fellow-to-Faculty Transition Award
  - Provides funding to physician scientists during the critical period of career development spanning completion of research training through the early years of first faculty position
  - Intent to provide a supportive mentored experience during the transition period

AHA Portfolio of Research Programs

- Fellow-to-Faculty Transition Award
  - M.D., M.D./Ph.D., D.O. needing additional research training under sponsor/mentor before independence
  - US citizen; permanent resident; foreign nationals holding: H-1, H-1B, TC, TN, O-1

AHA Portfolio of Research Programs

- Fellow-to-Faculty Transition Award
  - Training Phase – 2-3 years
    - Up to $65,000/year; no F&A costs
  - Independence Phase – 2-3 years
    - Up to $132,000/year; 10% F&A costs
  - Duration = 5 years with maximum of $593,000

AHA Portfolio of Research Programs

- Beginning Grant-in-Aid
  - Promotes the independent status of promising beginning scientists
  - Up to and including the rank of assistant professor or equivalent

AHA Portfolio of Research Programs

- Established Investigator Award
  - Supports the career development of highly promising, newly independent investigators by funding innovative projects not funded elswhere
  - 4-9 years since initial faculty appointment at the level of assistant professor

ACCF Research Awards

- ACCF/Merck Adult Cardiology Research Fellowship Awards
- ACCF Career Development Awards
- ACCF/GE Healthcare Cardiovascular Career Development Awards
- ACCF/Pfizer Post-doctoral Fellowship in Cardiology
- ACCF/FACT Florida Heart Failure Fellowship Award

Philanthropies & Foundations

- Robert Wood Johnson Foundation
- Doris Duke Foundation
- Heart Rhythm Society
- Heart Failure Society of America
- Etc……

The Last Word……..

Nothing in the world can take the place of persistence. Talent will not; nothing is more common than unsuccessful men [and women] with talent. Genius will not; unrewarded genius is almost a proverb. Education will not; the world is full of educated derelicts. Persistence and determination alone are omnipotent. The slogan, "Press on" has solved and always will solve the problems of the human race.

Calvin Coolidge