

F and K Awards 101

Tips and Tricks for Successful F and K Applications

Rachelle Johnson, Steve Kridel, Mary Reyland, and Jennifer Black

Justin Engel (F31), Delaney Geitgey (F31), Michael Sturdivant (F31),
Gwenyth Joseph (F99), and Viral Oza (F99)

Discussion of NIH Grant Mechanisms for Predocs and Postdocs

F30/F31: Individual Predoctoral Fellowship Award

F99/K00: Predoctoral to Postdoctoral Fellow Transition Award

F32: Postdoctoral Fellowship

K99/R00 and K22: Pathway to Independence Awards

K99/R00: NCI Pathway to Independence Award for Outstanding
Early Stage Postdoctoral Researchers

(Data Science, Cancer Control Science, Cancer Research)

General Tips

- **Start early** (at least three months prior to deadline)
- Read instructions carefully
- Find examples, confer with F & K awardees, seek input from department's grants administrator
- Seek input from sponsor, other faculty, colleagues
- *All the components of the application should tell a cohesive story; tell a consistent story throughout the entire application – every document needs to reinforce your potential*
- Revise, revise, revise
- Pay attention to details. Application must be aesthetically pleasing and error free!
- Be prepared to have to resubmit your application
- Make your PO your friend!

F awards

Purpose of a F30/31 award

- **F30:** To promote the integrated research and clinical training of promising MD/PhD students and enhance their potential to develop into productive, independent physician/clinician-scientists
- **F31:** To enable promising predoctoral students to obtain individualized, mentored cancer research training from outstanding faculty sponsors while conducting dissertation research



Changes to Fellowship Review Criteria and Application Form (apply to all F awards)

(for due dates on or after January 25, 2025)

New emphasis on:

- **Candidate's preparedness and potential**
- **Research Training Plan**
- **Commitment to the candidate (without undue consideration of narrow markers of academic success and sponsor/institutional reputation - designed to reduce bias)**
- **Note that the new application contains same essential elements**

SF424 App Guide

NOFO (Notice of Funding Announcements)

Related Notices

Reorganized Fellowship Review Criteria Areas

(for due dates on or after January 25, 2025)

CURRENT	NEW
Fellowship Candidate	Candidate Preparedness and Potential
Sponsors, Collaborators, Consultants	Research Training Plan
Research Training Plan	Commitment to Candidate
Training Potential	
Institutional Environment and Commitment to Training	

- Shorter application, aligned with new review criteria
- Less emphasis on sponsor track record, more emphasis on training plan and preparedness of candidate

The Three Main Components of an F application

(for due dates on or after January 25, 2025)

NEW
Candidate Preparedness and Potential
Research Training Plan
Commitment to Candidate

The Fellowship Applicant

New: The Candidate

Written by Candidate

Changes to Fellowship Application Form

(for due dates on or after January 25, 2025)

CURRENT	NEW
Candidate Biosketch Grades required	Grades no longer required/allowed
Fellowship Applicant Section <ul style="list-style-type: none">• Applicant's background• Goals for fellowship training	Candidate Section (Candidate's Goals, Preparedness, and Potential) <ol style="list-style-type: none">1. Statement of professional and fellowship goals2. Fellowship qualifications3. Self-assessment4. Statement of scientific perspective

Candidate Section (Candidate's Goals, Preparedness, and Potential)

1. Statement of professional and fellowship goals

Candidates share career goals and explain how the fellowship training fits in with those goals

2. Statement on fellowship qualifications

Describe scientific, research, and other experiences that have prepared the candidate to successfully complete the fellowship training (courses, workshops, other training, but not grades)

3. Self-assessment

Personal characteristics (e.g., skills, abilities, traits, attitudes) that will contribute to success as a scientist

4. Statement of scientific perspective (beyond own research training project: show that you can think as a scientist)

Reveals candidate's potential to think about and express ideas within a scientific field.

Candidates should discuss:

- Why their chosen field of science is important and how their research training project will advance the field
- A broader, unresolved scientific question in the chosen scientific field, the importance of the problem, and the ways biomedical research might advance the scientific field

F Fellowship Candidate



- The candidate must be **US citizen or permanent resident**
- **Must show strong potential to develop into an independent and productive researcher: highlight qualities such as scientific understanding, creativity, curiosity, resourcefulness, drive, resilience**
- Productivity
 - A **first-author publication** is a definite plus, but not required for success (new review criteria put less emphasis on publications)
 - Most applicants list middle author papers (with specific contribution to the study indicated)
 - Oral and poster presentations at meetings can reflect productivity
 - OK to include “manuscripts in preparation” in the Candidate section
- Having **honors and awards** is also a plus - mention accomplishments repeatedly in the application (Biosketch, Candidate section, Sponsor Letter, Letters of Recommendation)
- Highlight prior research experience; courses; workshops; technical skills; professional memberships; leadership roles; community outreach

The Research Training Plan

Written by Candidate in Consultation
with the Advisor

Changes to Fellowship Application Form

(for due dates on or after January 25, 2025)

- Some headings revised to emphasize the importance of training in the fellowship project
- Selection of Sponsor and Institution information moved elsewhere in the application

CURRENT	NEW
Research Training Plan <ul style="list-style-type: none">• Specific Aims• Research Strategy• Respective Contributions**• Selection of Sponsor and Institution**• Training in Responsible Conduct of Research	Research Training Plan <ol style="list-style-type: none">1. Training Activities and Timelines (aligned with Goals)*2. Research Training Project Specific Aims*3. Research Training Project Strategy*<ul style="list-style-type: none">• Scientific Foundation and Rationale• Approach4. Training in Responsible Conduct of Research (Institutionally Provided)

* Section added or revised

** Moved to a different part of the application

F Career Development Plan

- Identify **gaps in training** and justify the need for further career development
- Must prepare a detailed training plan that **expands** technical, professional, and/or research skills
- Describe what you will learn and where the training will come from (didactic classes; seminars; workshops; one-on-one training)
- Explain how filling these gaps will contribute to achieving career goals
- Describe opportunities to present and publish findings; attend conferences, additional lab meetings, journal clubs; interaction with scientists; learn new techniques; enhance manuscript and grant writing skills; etc.
- Include a **timeline** with milestones (including **manuscripts**) and benchmarks for evaluation of progress by your mentor(s). Sponsor statement should echo this timeline

Career Development Plan Time-Line

- Include a timeline with milestones and benchmarks for evaluation of progress by your mentor(s)

Career Development Plan	Year 1 (K99)				Year 2 (K99)				Faculty Member(s) Involved
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Meetings									
1-on-1 with co-mentors	[Red bars]								MW, JS
1-on-1 with advisory committee	[Red bars]								KR, MB, DP
Didactic activities									
Lab meetings, seminars	[Red bars]								MW, JS
Department retreats	[Red bars]								
Conferences	[Red bars]								
Courses	[Red bars]								
Workshops	[Red bars]								
Key training areas									
Biology of SCLC, EC and Metastasis	[Red bars]								KR, MW, JS
Techniques for proposed study	[Red bars]								MB, MW, JS
Data analysis and statistics	[Red bars]								DP, MB, MW
Exposure to clinical	[Red bars]								JN
Academic and leadership	[Red bars]								MW, JS
Job application									
Job search	[Red bars]								MW, JS, KR, MB, DP
Interviews, obtain job offers	[Red bars]								

Table 3. Timeline for Training Plan, Career Development, and Transition to Independence

Phase	K99 phase						R00 phase														
	Year 1			Year 2			Year 3		Year 4		Year 5										
Year	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer									
Mentoring	Weekly meetings with primary mentor (1 hr)						Continue collaborations with mentoring team														
	Bi-weekly meeting with co-mentor (1hr)						Seek out opportunities to co-mentor undergraduate and graduate students														
	Monthly collaborator meetings, more frequent as needed (1 hr)						Form new collaborations and mentoring relationships with mid-career and senior faculty														
Research	Aims 1 & 2 analyses						Aim 3 - participant recruitment, clinic visits, data analysis														
Experiential Training (1 day/wk)	Mentored research activities (health disparity/physical activity)						Seek out additional institutional training activities designed to support my career development. This includes opportunities for further training in grant writing, department seminars and journal clubs, and ethical conduct of research.														
	OS	DM	Accelerometers training with Dr. Diaz																		
Scientific Workshops			MR BC (2 days)			ML BC (2 days)															
			IBDCR (3 days)			NIH SI (1 week)															
Semester Courses	Genetic Epi	Survival Analysis			Molecular Epi																
Reading	Guided readings with mentors and collaborators												Stay updated on relevant scientific literatures								
Scientific Conferences	SABCS (5 days)	ASPO (3 days)	SER (4 days)	AACR (4 days)	ASPO (3 days)	ISBNPA (4 days)							SABCS (5 days)	ASPO (3 days)	SER (4 days)	AACR (4 days)	ASPO (3 days)	ISBNPA (3 days)	SABCS (5 days)	ASPO (3 days)	SER (4 days)
Career Development	Yearly training in Responsible Conduct of Research (12 hours didactic training per year)																				
	Develop individual development plan, review at quarterly mentoring meetings and update yearly																				
				Reach R01 (1 hr/wk, semester)	Mentor Wkshp (1 day)	PI Crash Course (2 days)															
	Attend internal seminars, journal clubs, and lab meetings (1 hr each, attend 2-3 per week)																				
	Writing activities related to scientific manuscripts and grant proposals (1 day/week)																				
Pathway to Independence		Academic App BC	Career Counsel	Practice Job Talk	Interview		Set up lab, hire research assist		Develop and submit R01		Re-submit R01 and apply to other RFAs										

AACR=American Association for Cancer Research – The Science of Cancer Health Disparities in Racial/Ethnic Minorities and the Medically Underserved; Academic App BC=Academic Application Boot Camp; ASPO=American Society of Preventive Oncology; DM=Digital Mammograms; Epi=Epidemiology; IBDCR= International Breast Density & Cancer Risk Assessment Workshop; ISBNPA=International Society of Behavioral Nutrition and Physical Activity; ML BC=Machine Learning Boot Camp; MR BC=Mendelian Randomization Boot Camp; NIH SI=National Institutes of Health Summer Institute on Randomized Behavioral Clinical Trials; OS=Optical Spectroscopy; SABCS=San Antonio Breast Cancer Symposium; SER=Society for Epidemiologic Research; Wkshp = Workshop

F Research Training Plan

- Research project should be scientifically rigorous, novel and fill a knowledge gap
- Should be based on high quality preliminary data and well integrated with training plan
 - Unconvincing preliminary data will reflect poorly on mentors and training
- Should provide potential for growth in skills such as data analysis, techniques, communication skills, etc.
- The project should relate to the sponsor or co-sponsor's expertise; **work closely with sponsor(s) in drafting the plan**
- Experimental plan should be feasible; **avoid being overambitious**
- **Rigor of the research training project will be assessed**
- Potential pitfalls and alternative strategies should be addressed
- Exploratory experiments are accepted, especially if they are linked to the training plan

F Research Training Plan

- Spend time on your application and figures. **Aesthetics matter**
- Pay attention to grantsmanship issues; seek help with proofreading
 - A poorly crafted application will raise questions about attention to detail and mentorship
- If using vertebrate animals, take time do the sample size calculations and include the information in the research plan

Sponsor(s), Collaborator(s), and Consultant(s) Section

**New: Commitment to Candidate,
Mentoring, and Training Environment**

Written by Sponsor

Changes to Fellowship Application Form

(for due dates on or after January 25, 2025)

CURRENT	NEW
<p>Sponsor(s), Collaborator(s), and Consultant(s) Section</p> <ul style="list-style-type: none">• Sponsor and Co-Sponsor Statements• Letters of Support from Collaborators, Contributors, and Consultants• Description of Institutional Environment and Commitment to Training**• Description of Candidate's contributions to Program Goals	<p>Commitment to Candidate, Mentoring, and Training Environment</p> <ol style="list-style-type: none">1. Sponsor and Co-Sponsor Statements<ul style="list-style-type: none">• Mentoring approach and candidate mentoring plan• Prior commitment to training and mentoring• Commitment to candidate's research training plan• Research training environment (aligned with candidate's needs)• Candidate's potential2. Letters of Support from Collaborators, Contributors, and Consultants3. Description of Candidate's contributions to Program Goals

** Moved to a different part of the application

F Mentoring Team

- Mentor/Co-mentor Credentials
 - Primary mentor must have a rigorous research program
 - Less emphasis on training record (having an early career sponsor is no longer a disadvantage)
 - Important that needs and goals of the candidate are matched by sponsor
 - Include a co-primary mentor if needed
- Include co-mentors who will complement the primary mentor's strengths: ensure that relevant expertise is available for all proposed training
- Each member of the candidate's "team" must play a role in the training/research plan
 - Call out mentors and collaborators throughout the application
 - Include biosketches that specify role
- Mentor must provide a strong mentoring plan that echoes the candidate's training goals - must show commitment to the candidate's success
- Specify how often you will meet with primary mentor, co-primary mentor if relevant, and members of mentoring team



F Sponsor/Co-Sponsor Statement(s)

- Another very important component; must be tailored to the applicant
- Must align with candidate's training plan (conferences, classes; manuscripts, workshops, lab meetings, training in scientific integrity, etc)
- Lab environment should be described
- Should discuss applicant's qualifications and potential for a research career – strengths of the application should be highlighted

Revisions to Reference Letters (updates in progress)

(for due dates on or after January 25, 2025)

- **Strong letters of reference very important**
- **Should attest to candidate's talents, accomplishments and potential for independent research**

Vagaries of the Review Process

Average scores (from 3 reviewers) on first non-funded grant in lab #1:

Fellowship Applicant: 2.33

Sponsors, Collaborators, and Consultants: 4

Research Training Plan: 5.33

Training Potential: 3.67

Institutional Environment & Commitment to Training: 1.67

Average scores (from 3 reviewers) on successfully funded grant in lab #2:

Fellowship Applicant: 1.67

Sponsors, Collaborators, and Consultants: 1.33

Research Training Plan: 2

Training Potential: 2.33

Institutional Environment & Commitment to Training: 1

Reviewers are biased to more favorably review the remaining information when they are more impressed with the key components of the grant, namely the research strategy/training plan itself

F99/K00 award – Hints for Success

Candidate

- **3rd or 4th year of PhD training (domestic or international)**
- **Need to convince Reviewers that candidate is ideally suited to advance and succeed as an independent researcher; strengths should be clearly identified**
- **Compelling body of preliminary research - a **paper**, especially first-author, is a big plus**
- **Compelling project with potential for questions that can be carried into postdoctoral and independent phases**
- **Prior funding is a plus**
- **Need for additional training should be clearly conveyed**

Sponsor

- **Must be committed to the career development of the candidate and be in a position to help the candidate achieve goals**

F99/K00 award – Hints for Success

Training Plan

- Training goals should be broader - cover F and K phase goals separately
- Identify gaps in knowledge/training and describe how they will be addressed
- Include training in managing a research group, building a professional network, mentoring trainees, relevant skillsets
- A timeline is helpful
- Assembly of a strong, diverse F99 Advisory Committee of experts to supplement training; consider adding co-sponsor from a different institution

Research Plan

2 Specific Aims (one for F and one for K phase)

- A **clear plan for the postdoctoral phase** with a list of names that indicates the type of mentor/institution that will be sought to help fulfill career development goals

K awards

Purpose of a K award

- To facilitate transition of outstanding postdoctoral fellows to independent research
- To support acquisition of new technical and professional skills
- To protect time for research activity and facilitate establishment of a record of independent research
- To generate pilot data
- To obtain R01 funding by the end of the K or soon after



The Ideal Candidate

K99 and K22 Fellowship Applicants

Eligibility: No citizenship requirement for K99/R00 applications

Citizenship or green card is needed at the time of K22 award issuance (citizenship or green card is not needed to apply for K22 funding)

Career Stage: Postdoctoral or Clinical Fellows

K99: Applicants must have no more than 4 years of postdoctoral research experience at the time of the initial or the subsequent resubmission application

K99/R00: NCI Pathway to Independence Award for Outstanding Early Stage Postdoctoral Researchers – **2 years**

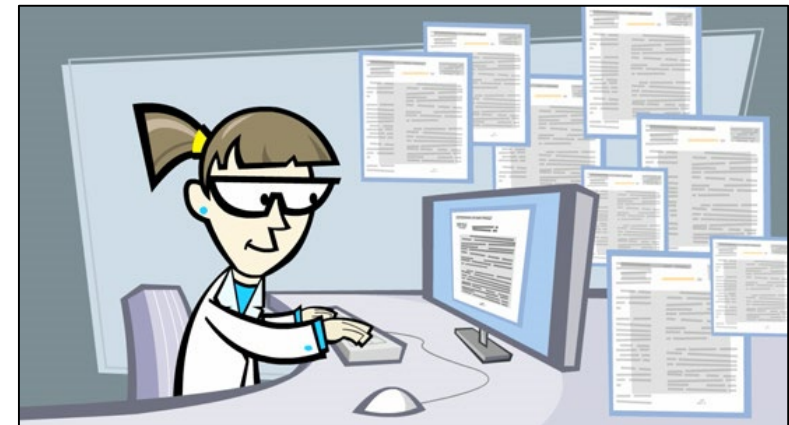
K22: ≥ 2 years and ≤ 8 years of mentored research training experience after doctorate at time of submission and resubmission

<https://www.cancer.gov/grants-training/training/funding/k99>

<https://www.cancer.gov/grants-training/training/funding/k22>

K Fellowship Applicant

- **Productivity is key:**
 - **First-author papers** from PhD **and** postdoctoral work essential
 - Manuscripts in review or uploaded to bioRxiv do not count
 - Preferable to have sole first-author paper(s)
 - Co-first author papers count
 - Co-authored papers are valued because they point to collaboration and willingness to be part of a team
- Awards, conference presentations
- Track record of extramural fellowships



A Strong Career Development Plan

K Career Development Plan

BRIDGE TO
INDEPENDENCE

- Identify **gaps in training** and justify the need for further career development
- Describe career development activities for K99 phase:
 - hands-on training
 - didactic courses
 - conferences and workshops
 - training in professional skills (laboratory management, grant writing, networking, oral and written communication)
- Provide **a plan for separation from mentor**
- Provide a **plan for transition to independent position** and **first R01 submission** (R00 phase)



K Career Development Plan

- Include a detailed timeline with milestones and benchmarks for evaluation of progress by your mentor(s)

Career Development Plan	Year 1 (K99)				Year 2 (K99)				Faculty Member(s) Involved
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Meetings									
1-on-1 with co-mentors									MW, JS
1-on-1 with advisory committee									KR, MB, DP
Didactic activities									
Lab meetings, seminars									MW, JS
Department retreats									
Conferences									
Courses									
Workshops									
Key training areas									
Biology of SCLC, EC and Metastasis									KR, MW, JS
Techniques for proposed study									MB, MW, JS
Data analysis and statistics									DP, MB, MW
Exposure to clinical									JN
Academic and leadership									MW, JS
Job application									
Job search									MW, JS, KR, MB, DP
Interviews, obtain job offers									

Table 3. Timeline for Training Plan, Career Development, and Transition to Independence

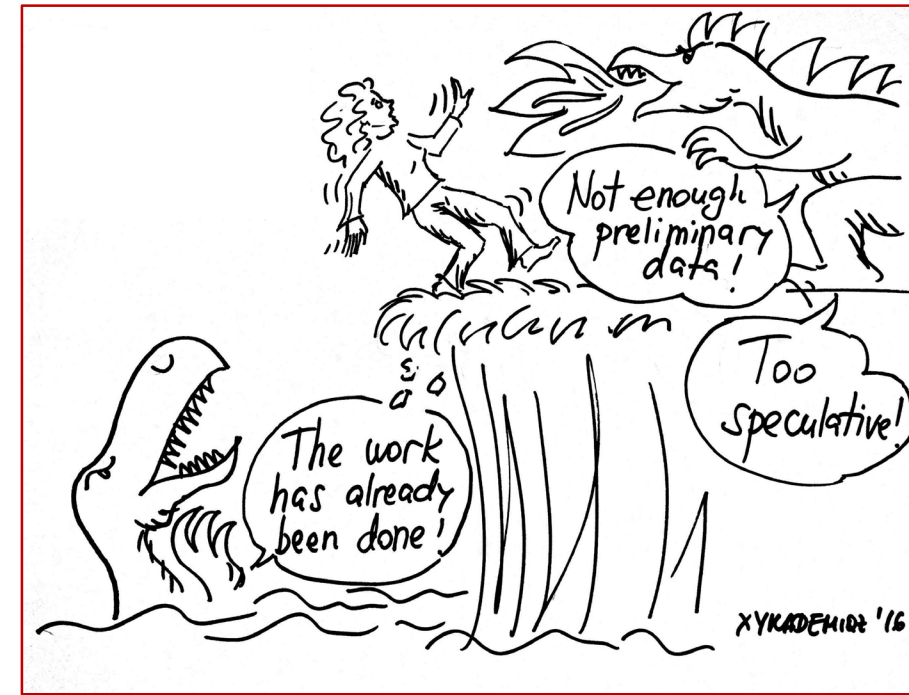
Phase	K99 phase						R00 phase														
	Year 1			Year 2			Year 3		Year 4		Year 5										
Semester	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer									
Mentoring	Weekly meetings with primary mentor (1 hr)						Continue collaborations with mentoring team														
	Bi-weekly meeting with co-mentor (1hr)						Seek out opportunities to co-mentor undergraduate and graduate students														
	Monthly collaborator meetings, more frequent as needed (1 hr)						Form new collaborations and mentoring relationships with mid-career and senior faculty														
Research	Aims 1 & 2 analyses						Aim 3 - participant recruitment, clinic visits, data analysis														
	Aims 1 & 2 analyses						Aim 3 - participant recruitment, clinic visits, data analysis														
Experiential Training (1 day/wk)	Mentored research activities (health disparity/physical activity)						Seek out additional institutional training activities designed to support my career development. This includes opportunities for further training in grant writing, department seminars and journal clubs, and ethical conduct of research.														
	OS	DM	Accelerometers training with Dr. Diaz																		
Scientific Workshops			MR BC (2 days)			ML BC (2 days)															
			IBDCR (3 days)			NIH SI (1 week)															
Semester Courses	Genetic Epi	Survival Analysis			Molecular Epi																
Reading	Guided readings with mentors and collaborators												Stay updated on relevant scientific literatures								
Scientific Conferences	SABCS (5 days)	ASPO (3 days)	SER (4 days)	AACR (4 days)	ASPO (3 days)	ISBNPA (4 days)							SABCS (5 days)	ASPO (3 days)	SER (4 days)	AACR (4 days)	ASPO (3 days)	ISBNPA (3 days)	SABCS (5 days)	ASPO (3 days)	SER (4 days)
Career Development	Yearly training in Responsible Conduct of Research (12 hours didactic training per year)																				
	Develop individual development plan, review at quarterly mentoring meetings and update yearly																				
				Reach R01 (1 hr/wk, semester)	Mentor Wkshp (1 day)	PI Crash Course (2 days)															
	Attend internal seminars, journal clubs, and lab meetings (1 hr each, attend 2-3 per week)																				
	Writing activities related to scientific manuscripts and grant proposals (1 day/week)																				
Pathway to Independence		Academic App BC	Career Counsel	Practice Job Talk	Interview		Set up lab, hire research assist		Develop and submit R01		Re-submit R01 and apply to other RFAs										

AACR=American Association for Cancer Research – The Science of Cancer Health Disparities in Racial/Ethnic Minorities and the Medically Underserved; Academic App BC=Academic Application Boot Camp; ASPO=American Society of Preventive Oncology; DM=Digital Mammograms; Epi=Epidemiology; IBDCR= International Breast Density & Cancer Risk Assessment Workshop; ISBNPA=International Society of Behavioral Nutrition and Physical Activity; ML BC=Machine Learning Boot Camp; MR BC=Mendelian Randomization Boot Camp; NIH SI=National Institutes of Health Summer Institute on Randomized Behavioral Clinical Trials; OS=Optical Spectroscopy; SABCS=San Antonio Breast Cancer Symposium; SER=Society for Epidemiologic Research; Wkshp = Workshop

The Research Plan

K Research Training Plan

- Must have **strong preliminary data** in support of the proposed Aims, preferably published
- Clearly define work that will be done in the **mentored (K99) vs independent (R00) phase** of the award
- Indicate what you still need to accomplish during the mentored phase to successfully launch an independent research program
- Describe how you will **separate your scientific program** from that of your mentor
- Avoid exploratory and overambitious aims
- Pay attention to grantsmanship issues; seek help with proofreading



<https://xykademiqz.com/2016/04/21/preliminary-data/>

**Mentor(s), Co-Mentor(s),
Consultant(s), Collaborators**

K Mentoring Team

- Identify a primary mentor(s) and co-mentors with relevant expertise who are committed to your career development (include biosketches)
- Primary mentor must have a strong research program, a record of training and sufficient funding to cover the costs of the mentored phase (can include a co-primary mentor if needed)
- Ensure that relevant expertise is available for all proposed training
- Mentor statement should echo your training goals
- Specify how often you will meet with mentor(s) and members of your mentoring team
- Mentor should indicate that you can take your project, reagents etc with you to the independent phase



Environment and Institutional Commitment

K Research Environment and Institutional Commitment

- Institution should show commitment to the career development of the candidate – this is extremely important
 - Protected time
 - Space
 - Resources
- Letter of Institutional Commitment should be included in the application (should state that continued support of the candidate is not dependent on receipt of the award)
- The Institution does not need to commit to hiring the candidate

THE F AWARD PANEL



Mary E. Reyland, PhD

Professor, Department of Craniofacial Biology
University of Colorado Denver – Anschutz Medical Campus
Director, T32 Training Program in Cancer Biology
Research Interests: Protein Kinase C and Salivary Gland
Apoptosis, Radioprotection of the Salivary Gland

THE F AWARD PANEL

F31 RECIPIENT



Justin Engel

**PhD Candidate, Cancer Biology
UT Southwestern**

Research Interests: Mechanisms
Underlying Genomic Rearrangements,
Chromothripsis

F31 RECIPIENT



Delaney Geitgey

**PhD Candidate, Cancer Biology
Emory University**

Research Interests: Pancreatic Cancer
Immunotherapies

F31 RECIPIENT



Michael Sturdivant

**PhD Candidate, Pharmacology
University of North Carolina Chapel Hill**
Research Interests: Mutagenic Effects of
APOBEC3A and APOBEC3B in Urothelial
Carcinoma

THE F AWARD PANEL

F99/K00 RECIPIENT



Gwenyth Joseph, PhD

PhD Candidate, Cancer Biology

Vanderbilt Center for Bone Biology

Research Interests: Metabolic States
that Regulate the Cancer Epigenome

F99/K00 RECIPIENT



Viral Oza, PhD

**PhD Candidate, Molecular and Cellular
Biochemistry**

University of Kentucky

Research Interests: Role of Diffuse
Midline Glioma-derived Extracellular
Vesicles in Tumor Radioresistance

THE K AWARD PANEL

RECIPIENT
K99/R00 Award



Rachelle W. Johnson, PhD
Associate Professor
Vanderbilt Center for Bone Biology
Director of Graduate Studies
Program in Cancer Biology
Vanderbilt University
Research Interests: Mechanisms of
Bone Metastasis; Tumor Dormancy
and Recurrence in Bone

REVIEWER (NCI-I)
(K99/R00, K22)



Steven J. Kridel, PhD
Chair, Cancer Biology
Wake Forest University School of Medicine
Research Interests: Role of Fatty Acid Synthesis
in Tumors

REVIEWER (NCI-I)
(K99/R00, K22)



Jennifer Black, PhD
Professor, Cancer Biology
PI T32 Cancer Biology Training Program
University of Nebraska Medical Center
Research Interests: Cell Signaling in GI
Cancers

