# F and K Awards 101

## Tips and Tricks for Successful F and K Applications

Jon Houtman, Anna Riegel and Jennifer Black

Anna Kovilakath (F31), Johnson Ung (F31, F99), Alexis Wilson (F31),
Shira Yomtoubian (F32), and Brittany Allen-Petersen (K22)

# 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)

# THE PANEL

**REVIEWER**
**F99/K00 Award**
**K22 Awards**

**Jon Houtman, PhD**
**Professor, Microbiology and Immunology**
**Associate Director for Career Enhancement**
**Holden Comprehensive Cancer Center**
**University of Iowa**
Research Interests: T cell Receptor Signaling

**REVIEWER**
**Oncological Sciences**
**(F30/F31/F32)**

**Anna Riegel, PhD**
**Professor, Oncology and Pharmacology**
**Vice President for Biomedical Graduate Education and Research**
**Georgetown University**
Research Interests: Breast Cancer, Epigenetics

**REVIEWER (NCI-I)**
**F99/K00 Award**
**K22 Award**

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

# THE PANEL

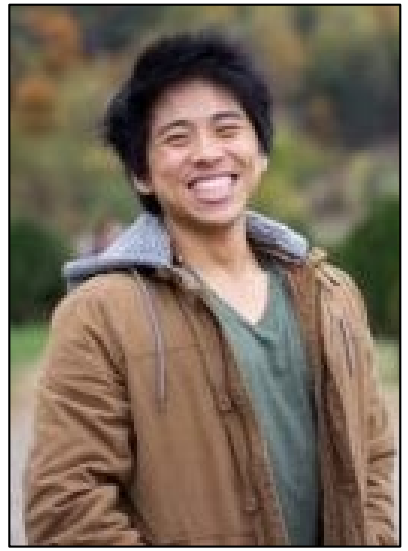
## F31 RECIPIENT

**Anna Kovilakath**
**Postdoctoral Researcher**
**Virginia Commonwealth University**
Research Interests: Sphingolipids in the Heart Failure

## F31 RECIPIENT

**Alexis Wilson**
**PhD Candidate**
**Wayne State University**
Research Interests: Bone Metastatic Prostate Cancer

## F31, F99 RECIPIENT



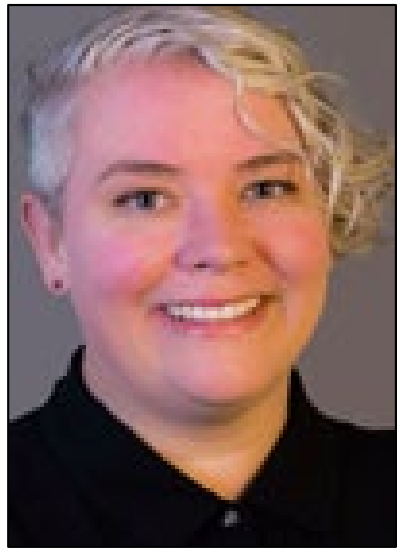
**Johnson Ung**
**PhD Candidate**
**University of Virginia**
Research Interests: Novel Sphingolipid-based Therapeutics to Augment Current AML Treatments

# THE PANEL

## F32 RECIPIENT

**Shira Yomtoubian, PhD**
**Postdoctoral Fellow**
**Salk Institute**
Research Interests: Metabolic States that Regulate the Cancer Epigenome

## K22 RECIPIENT



**Brittany Allen-Petersen, PhD**
**Assistant Professor**
**Purdue University**
Research Interests: Signal Transduction, Phosphatases, Pancreatic Cancer

# Discussion of NIH Grant Mechanisms for Predocs and Postdocs

**F30/F31: Individual Predoctoral Fellowship Award**

**F32: Postdoctoral Fellowship**

**F99/K00: Predoctoral to Postdoctoral Fellow Transition Award**

**K99/R00 and K22: Pathway to Independence Awards**

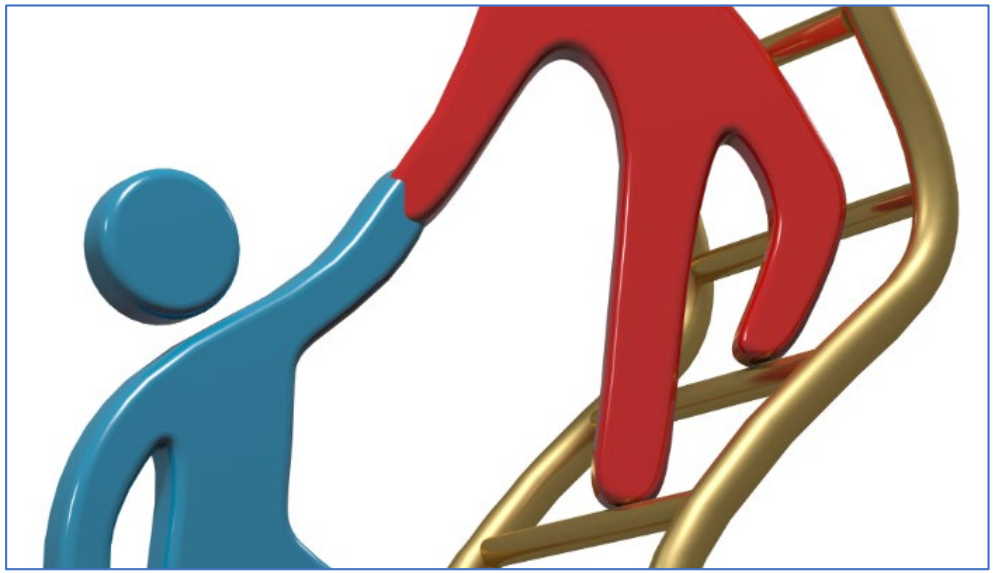
**K99/R00: NCI Pathway to Independence Award for Outstanding Early Stage Postdoctoral Researchers**
(Data Science, Cancer Control Science, Cancer Research)

# 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**



# The Fellowship Applicant

# F Fellowship Applicant

- The candidate must be **US citizen or permanent resident**
- **Must show strong potential to develop into an independent and productive researcher**
- Productivity
  - A **first-author publication** is a definite plus, but not required for success
  - 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 Applicant Background section
- Academic track record
  - High academic performance in the sciences - **a strong GPA** is favorably reviewed (provide an explanation for low grades if you have them; upward trajectory is also favorably viewed)
- Having **honors and awards** is also a plus - mention accomplishments repeatedly in the application (Biosketch, Applicant Background section, Sponsor Letter, Letters of Recommendation)
- Highlight prior research experience; professional memberships; leadership roles; community outreach

https://in.pinterest.com/pin/musical-animals-rooster-trumpet-royalty-free-vector-image--623326404657243680/

# Sponsors, Collaborators, Mentors

# F Mentoring Team

- Mentor/Co-mentor Credentials
  - Primary mentor must have a strong research program, training experience (must have graduated Ph.D. students), and sufficient funding to cover the costs of training
  - 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 your "team" must play a role in your training or research plan
  - Call out mentors and collaborators throughout the application
  - Include biosketches that specify role
- Mentor statement should echo your training goals and show commitment to your training needs
- Specify how often you will meet with primary mentor, co-primary mentor if relevant, and members of mentoring team

# The Research Training Plan

# F Research Training Plan

- Research project should be 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**
- 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

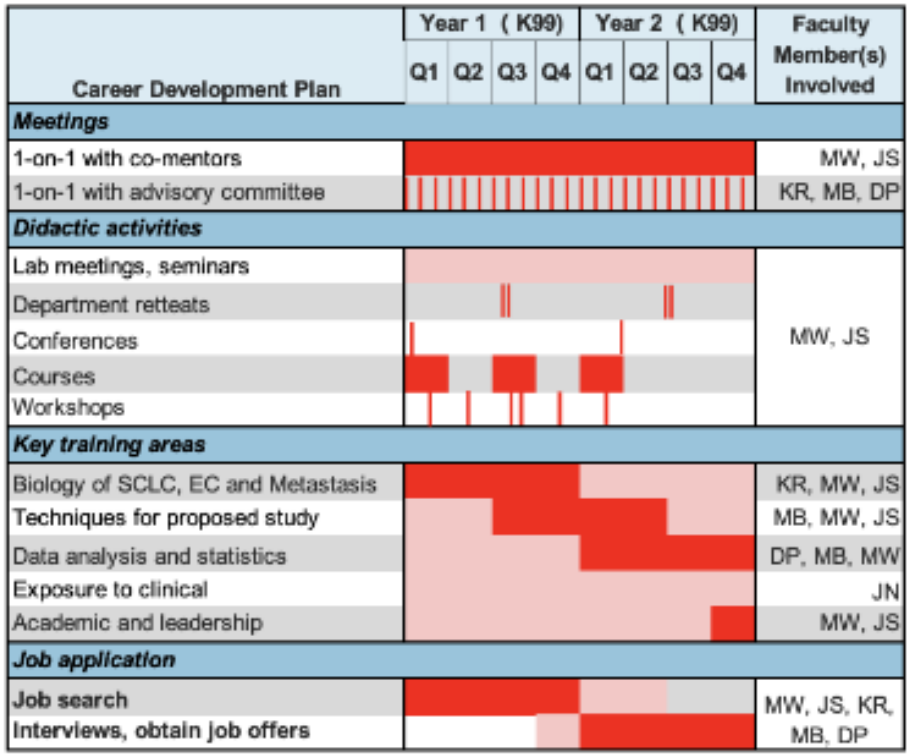
# Training Potential

# F Career Development Plan

- Reviewed as **"Training Potential"** – very important component
- 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)
- 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) Q1 | Q2 | Q3 | Q4 | Year 2 (K99) Q1 | Q2 | Q3 | Q4 | Faculty Member(s) Involved |
|---|---|---|---|---|---|---|---|---|---|
| ***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 | Year 1 | | | Year 2 | | | Year 3 | | | Year 4 | | | Year 5 | | |
| Semester | Fall | Spring | Summer | 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 | | | | | | | | |
| | Quarterly evaluation meetings with entire team (1.5 hrs) | | | | | | | | | | | | | | |
| 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 Sponsor/Co-Sponsor Statement(s)

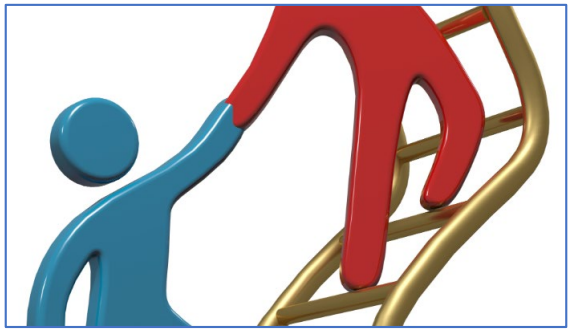
- Another very important component; must be tailored to the applicant
- Must align with candidate's training plan (conferences, classes; manuscripts, workshops, lab meetings, training in  scientific integrity, etc)
- Lab environment should be described
- Should discuss applicant's qualifications and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

# Institutional Environment and Commitment to Training

# F Institutional Environment and Commitment to Training

- Institutional letters should identify financial support, retention rate, and career development opportunities
- There should be a strong environment that will facilitate intellectual development

# F99/K00 award – Hints for Success



- **Need to convince Reviewers that you are ideally suited to advance and succeed as an independent researcher; clearly identify your strengths**
- **Grades should not be included, but a high GPA can be mentioned in the Applicant Candidate Background section**
- **A paper, especially first-author, is a big plus**
- **Prior funding is a plus**
- **Identify gaps in knowledge/training and describe how you will fill them**
- **Make sure you assemble a strong, diverse F99 Advisory Committee of experts to supplement training**
- **A clear plan for the postdoctoral phase with a list of names that indicates the type of mentor that will be sought to help fulfill career development goals**

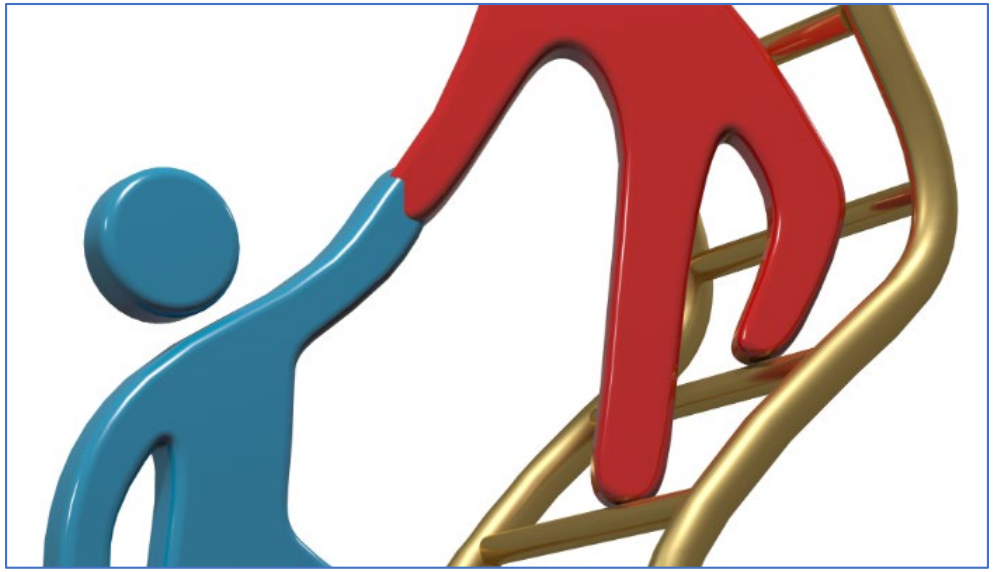
# F32 award – Hints for Success

- Use your collaborators to address gaps in skillset or technical expertise
- Propose a topic that benefits from the expertise of your sponsor
- **Research Training and Training Plan:** Time management plans are very important; provide a reasonable timeline for completion of proposed work

# 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

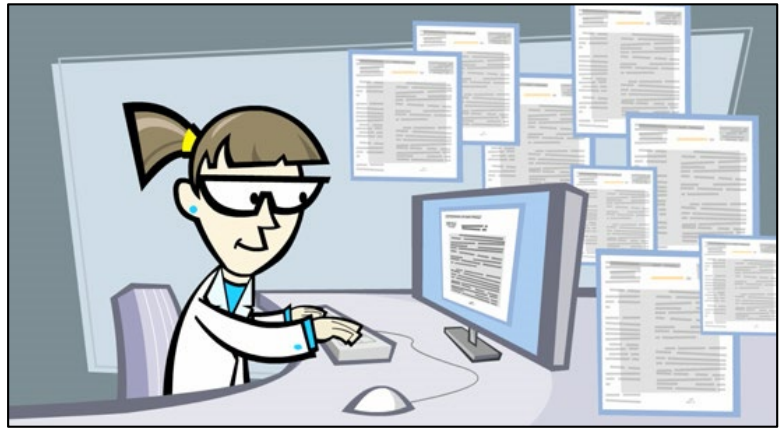
**K99/R00: NCI Pathway to Independence Award for Outstanding Early Stage Postdoctoral Researchers – 2 years**

**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

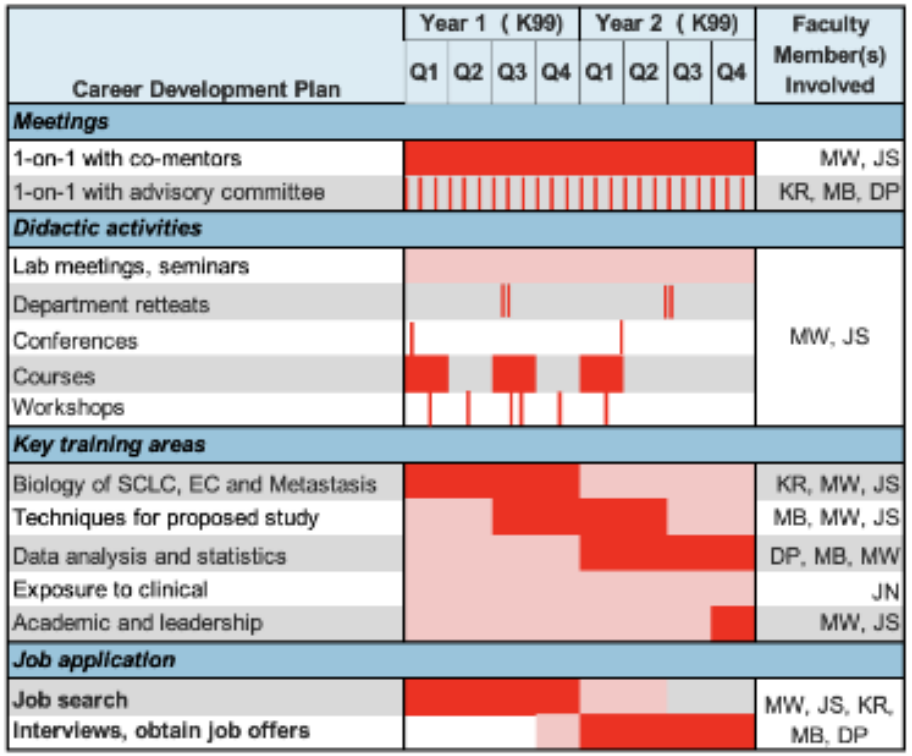
- Describe career development activities for K99 phase:
  - hands-on training
  - didactic courses
  - conferences and workshops
  - training in professional skills (laboratory management, grant writing, networking, oral and written communication)

- 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) Q1 | Q2 | Q3 | Q4 | Year 2 (K99) Q1 | Q2 | Q3 | Q4 | Faculty Member(s) Involved |
|---|---|---|---|---|---|---|---|---|---|
| ***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 | | | | | | | | | |

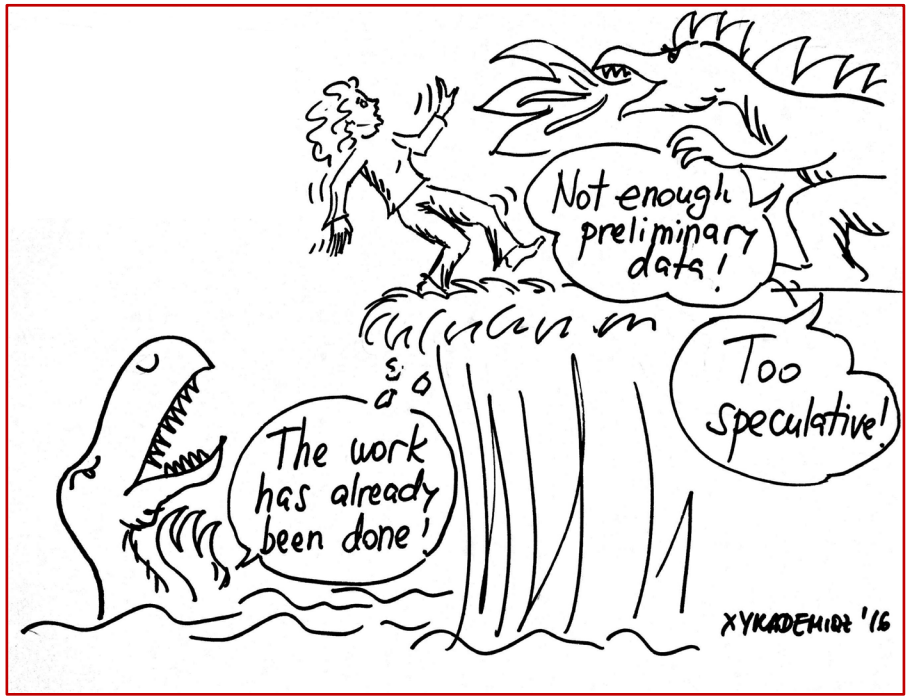
**Table 3. Timeline for Training Plan, Career Development, and Transition to Independence**

| Phase | K99 phase | | | | | | R00 phase | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Year 1 | | | Year 2 | | | Year 3 | | | Year 4 | | | Year 5 | | |
| Semester | Fall | Spring | Summer | 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 | | | | | | | | |
| | Quarterly evaluation meetings with entire team (1.5 hrs) | | | | | | | | | | | | | | |
| 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

# The Research Plan

# K Research Training Plan




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

- 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

# 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
- <u>Mentor should indicate that you can take your project, reagents etc with you to the independent phase</u>

# 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

# General

- 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
- *All the components of the application should tell a cohesive story; tell a consistent story throughout the entire application – every document needs to be reinforce your potential*
- Seek input from sponsor, other faculty, colleagues
- 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!

# Improving Fellowship Review

## Goals of Proposed Changes:

- Allow peer reviewers to evaluate the applicant's potential and the quality of the scientific training plan without influence of the sponsor's or institution's reputation
- Ensure that the information provided in the application is aligned with the restructured criteria and targeted to the fellowship candidate's specific training needs

**Review Criteria**

**I. Scientific Potential, Fellowship Goals, and Preparedness of the Applicant**

Evaluates the candidate's accomplishments in the context of stage of training and available scientific opportunities, as well as other factors that bear on potential to succeed, such as determination, persistence, and creativity. (scored 1-9)

**II. Science and Scientific Resources**

Evaluates the extent to which needed technical, scientific, and clinical resources are specified and are realistically available to the applicant, and whether the scientific expertise of the mentorship team is appropriate for the proposed science and that the role of each mentor is clearly defined. (scored 1-9)

**III. Training Plan and Training Resources**.

Evaluates whether the necessary training resources are well-specified and available, specifically the practical availability of resources, and to include an evaluation of the training philosophy of the sponsor, their approach to training, time commitments, and their accessibility. (scored 1-9)

**Additional Review Criteria** (not scored, but affecting Overall Impact; no changes proposed):

- Protections for Human Subjects
- Inclusion of Women, Minorities, and Individuals Across the Lifespan
- Vertebrate Animals
- Biohazards
- Resubmission

**Additional Review Considerations** (not scored and having no effect on Overall Impact, no changes proposed): Training in the Responsible Conduct of Research

- Authentication of Key Biological and/or Chemical Resources
- Budget and Period of Support
- Applications from Foreign Organizations
- Select Agents
- Resource Sharing Plans