

The Duke Viral Oncology Training Program

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Duke Viral Oncology Training Program

- History
- Size and scope of program
- Trainee productivity and outcomes
- T32 renewal in 2013 (A0: 30 → A1: 16)
- Recent enhancements

History of Duke VOTP/VOTG

- Initiated in 1972 with founding of Duke Comprehensive Cancer Center
- NCI T32 (VOTG) funded in 1975 and renewed in 1980, 1985, 1991, 1996, 2001, 2008, 2013
- Program Directors:
 - Wolfgang “Bill” Joklik (1975-1991)
 - Joe Nevins (1991-2008)
 - Bryan Cullen (2008-present)

VOTP Leadership and Administration

- Program Director: Dr. Bryan Cullen
- Associate Program Director: Dr. Micah Luftig
- Administrative Coordinator: Christy Krupa
- Financial Manager: Kim Kobes

Executive Committee:

Bryan Cullen, Micah Luftig, and Stacy Horner

Internal Training Advisory Committee:

Marilyn Telen, Director of Hematology T32

Henry Friedman, Director of Neuro-Oncology T32

Xiao-Fan Wang, Director of Cancer Biology T32

Scope of Research in VOTP

Program Labs: 18 faculty members in 5 departments

- Basic: Molecular Genetics and Microbiology and Pharmacology and Cancer Biology
- Clinical: Medicine, Pediatrics, Surgery

10 PhDs, 5 MDs, 3 MD/PhDs

- Oncogenic viruses
- Viral/cellular oncogenes
- Oncolytic therapy/viral immunotherapy/gene therapy
- Viruses predisposing to cancer (e.g. HIV)

VOTP training labs

Name/Degree(s)	Rank	Primary (& Secondary) Appointment(s)	Role in Program	Research Interest
Counter, Christopher, PhD	Prof.	Pharmacology & Cancer Biology (Radiation Oncology)	Mentor	Molecular mechanisms of cell transformation
Cullen, Bryan R., PhD	Prof.	Molecular Genetics & Microbiology (Medicine)	Program Director, Mentor	Role of microRNAs in oncogenic herpesvirus latency
Dave, Sandeep MD	Assoc. Prof.	Medicine-Hematological Malignancies	Mentor	Genetics of lymphomas
Devi, Gayathri, PhD	Assoc. Prof.	Surgery-Surgical Sciences (Pathology)	Mentor	Oncology, Apoptosis signaling, Immune evasion mechanisms
Gromeier, Matthias, MD	Assoc. Prof.	Surgery-Neurosurgery (Molecular Genetics & Microbiology, Medicine)	Mentor	Translation regulation, viral oncolytic immunotherapy
Haynes, Barton F., MD	Prof.	Medicine-Human Vaccine Institute (Immunology)	Mentor	T-cell immunology and retrovirology, HIV/AIDS vaccine development
Horner, Stacy, PhD	Asst. Prof.	Molecular Genetics & Microbiology	Mentor*	HCV innate immunity
Keene, Jack, PhD	Prof.	Molecular Genetics & Microbiology	Mentor	RNA regulation in cancer and virus infected cells
Klotman, Mary, MD	Prof.	Medicine (Molecular Genetics & Microbiology)	Mentor	HIV pathogenesis

VOTP training labs

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Koeberl, Dwight, MD, PhD	Assoc. Prof.	Pediatrics-Medical Genetics (Molecular Genetics & Microbiology)	Mentor	Gene therapy, virology, human genetics
Luftig, Micah, PhD	Asst. Prof.	Molecular Genetics & Microbiology	Associate Program Director, Mentor	Mechanisms of innate tumor suppressor responses to DNA tumor viruses
Lyerly, Herbert K., MD	Prof.	Surgery (Pathology, Immunology)	Mentor	Viral vectors in cancer immunotherapy
Pendergast, Ann Marie, PhD	Prof.	Pharmacology & Cancer Biology	Mentor	Role of the Abl tyrosine kinases in cell growth and transformation
Pickup, David, PhD	Assoc. Prof.	Molecular Genetics & Microbiology	Mentor	Poxvirus replication
Sampson, John, MD, PhD	Prof.	Surgery-Neurosurgery (Immunology, Pathology, Radiation Oncology)	Mentor	Translational research, Investigational drugs and brain cancer therapeutics
Sullenger Bruce A., PhD	Prof.	Surgery-Surgical Sciences (Pharmacology & Cancer Biology, Molecular Genetics & Microbiology)	Mentor	Modulation of the immune response and thrombosis using RNA aptamers
Tomaras, Georgia D., PhD	Assoc. Prof.	Surgery-Surgical Sciences (Immunology, Molecular Genetics & Microbiology, Human Vaccine Institute)	Mentor	Protective host immune responses to HIV-1
Yang, Yiping, MD, PhD	Prof.	Medicine – Hematological Malignancies (Immunology)	Mentor	Viral immunity and tumor immunology

Collaboration among VOTP training labs

Overall (18 faculty/5 years)

- 107 collaborative publications
- 12 collaborative grants

Collaborative Areas

EBV (Luftig, Cullen, Dave, Haynes)

HIV (Haynes, Tomaras)

Glioblastoma/CMV (Sampson/Mitchell, Cullen)

VOTG Trainee Landscape

- 7 predocs/ 4 postdocs (1975 → 2008)
- 5 predocs/2 postdocs (2008 → 2013)
- 3 predocs/4 postdocs (2013 → present)

- Predoctoral students are supported on VOTG in 2nd year
 - Recruited from VOTP labs; entering from any Duke Graduate Program (e.g. MCB, CMB, MGM)
 - EC review of all VOTG eligible candidates
- Postdoctoral candidates are supported for years 1-2 or 3 and applications are solicited annually from VOTP labs for EC review

VOTG Trainee Productivity

In past 10 years:

182 total manuscripts published

8 independent fellowships obtained

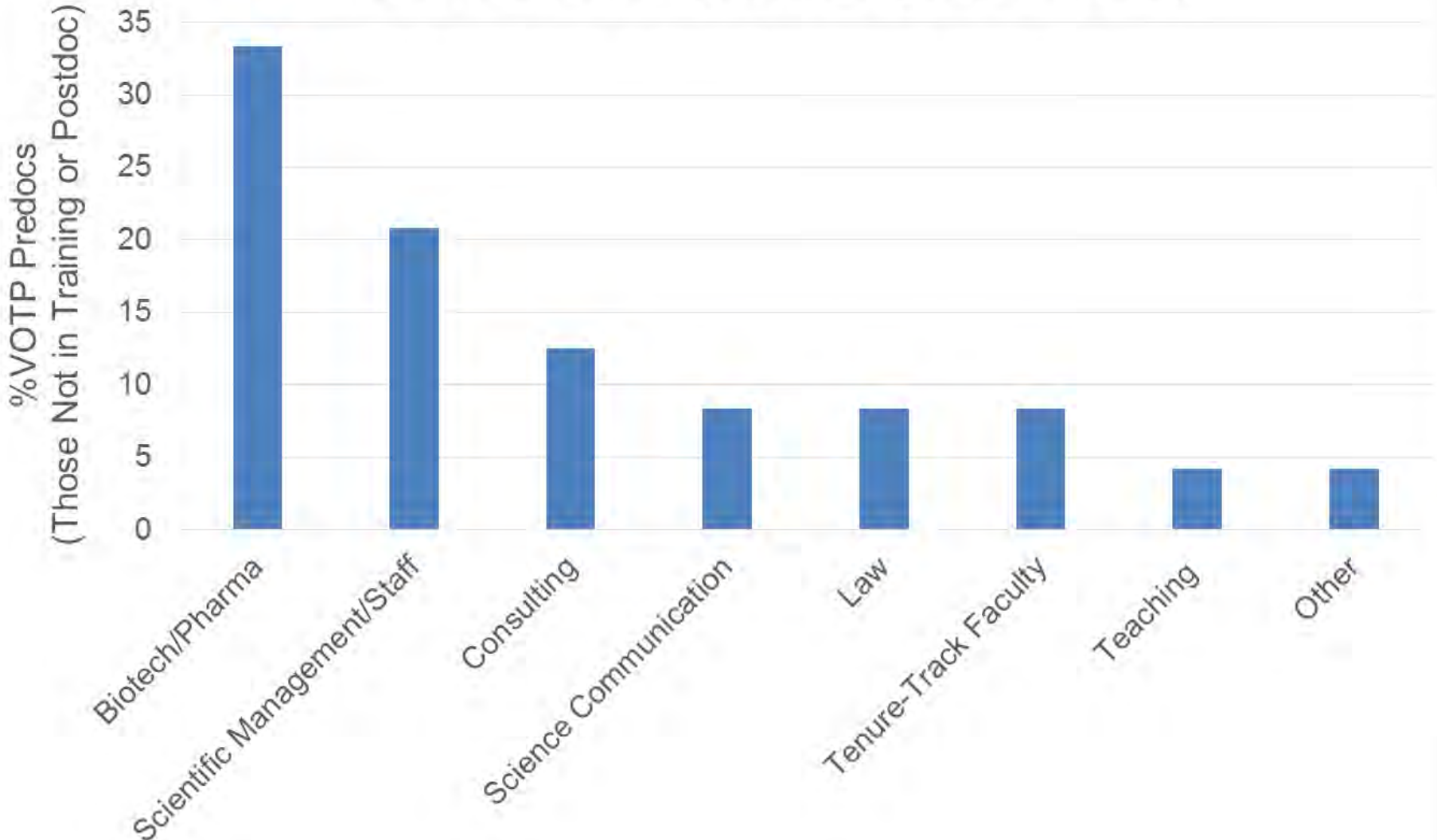
- **34 predocs** over past 10 years:
 - Publications: 110, Mean: 2.8, Median: 2
 - 3 obtained independent fellowships
- **13 postdocs** over past 10 years:
 - Publications: 72, Mean: 4.3, Median: 3
 - 5 obtained independent fellowships

VOTG Trainee Outcomes

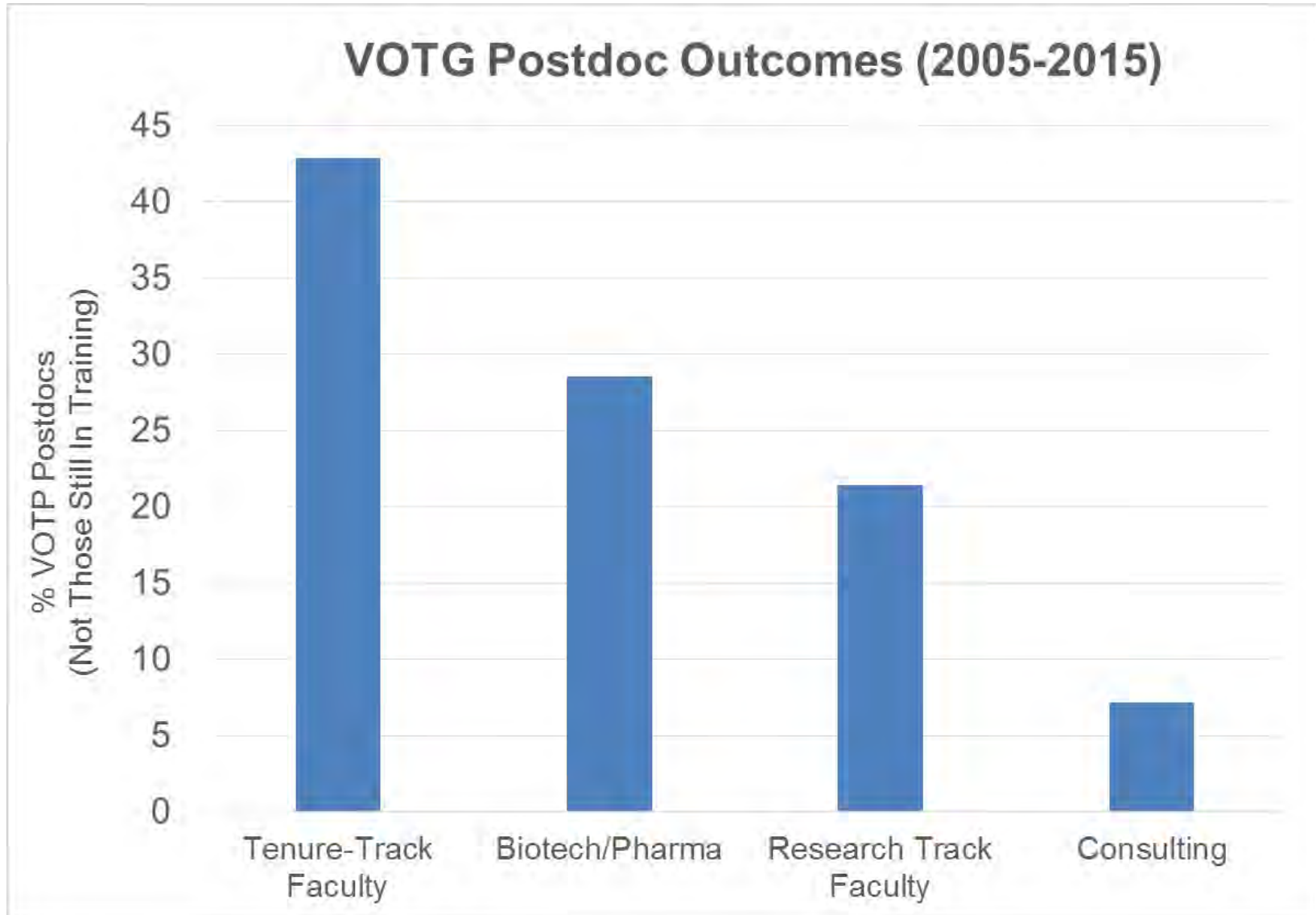
- 54 of 138 VOTG trainees over 37 years have gone on to academic faculty positions

VOTG Trainee Outcomes

VOTG Predoc Outcomes (2005-2015)



VOTG Trainee Outcomes



URM Recruitment and Retention

- 3 of 18 predocs were URM in 2008-2013
 - Duke URM recruiting: 8% (1999-2009) → 19% (2012)
 - Office of Biomedical Graduate Diversity run by Dr. Sherilynn Black since 2010
 - Focused recruitment and retention efforts
 - BioCoRE program (NIH IMSD Award)
- 1 of 6 postdocs were URM in 2008-2013

Reviews from 2012 A0 Submission

Priority Score: 30

- Strengths
 - Strong leadership
 - Long record of outstanding productivity and collaboration
 - Clear cancer focus
- Weaknesses
 - Ambiguity in trainee selection
 - Lack of program structure and required activities
 - Poor career development efforts
 - Lack of clinical cancer connection
 - Lack of external advisory committee

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VOTG Predoctoral Program

Figure 1. Structure of Predoctoral Viral Oncology Training Program

	Year 1	Year 2*	Year 3	Year 4	Year 5
Curriculum:	GS101 Coursework VIR	GW (VIR)	Prelim Exam		
Research:	Rotations	Join Thesis Lab	Thesis Research		
		Works In Progress/Journal Club			
		Viral Oncology Symposium (Fall)/Virology Mini-Symposium (Spring)			
Mentoring/ Career Dev:	Dept/Prog Advising	VOTG Advising			
		F31 App	Thesis Committee		
			Natl/Intl Meetings		
RCR:	Beaufort		SOM RCR		RCR

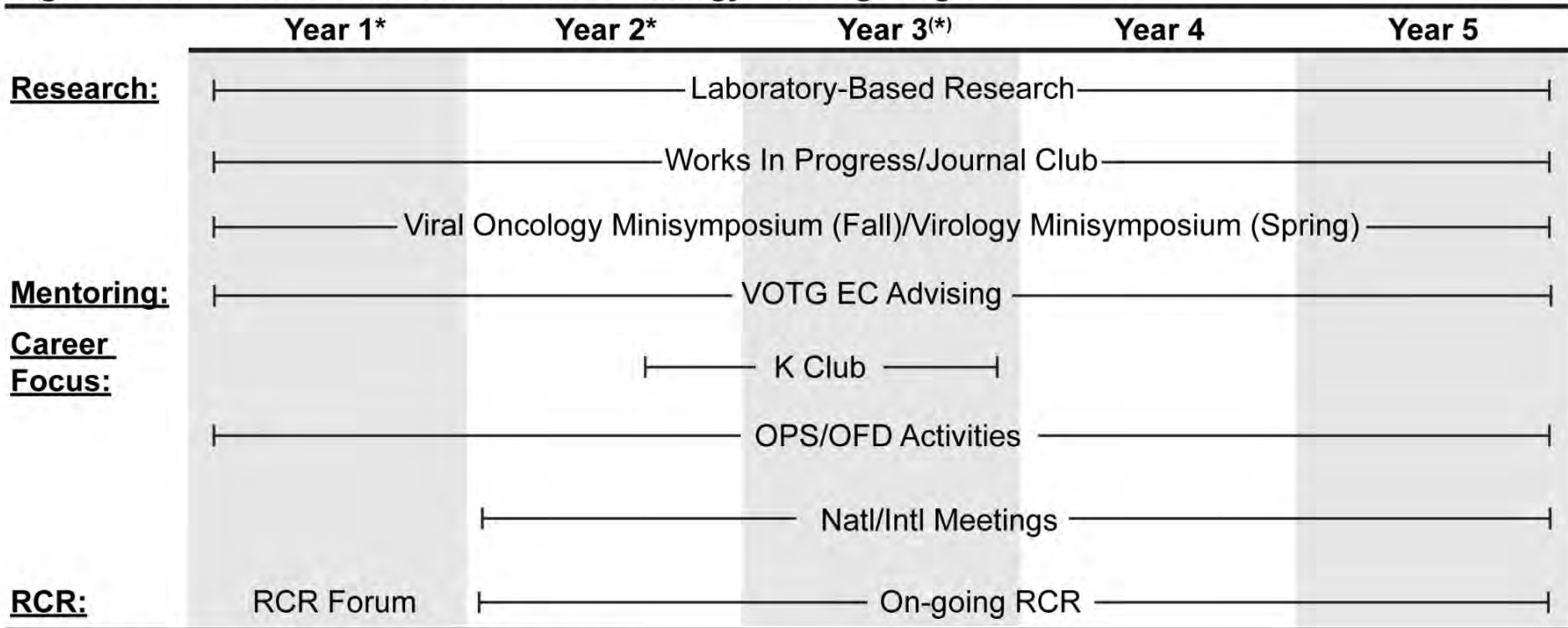
Year 2*: VOTG Support

RCR: Responsible Conduct in Research; SOM: Duke School of Medicine; GW: Grant Writing course;

GS101: Grad School 101 nuts and bolts course; VIR: Virology and Viral Oncology course

VOTG Postdoctoral Program

Figure 2. Structure of Postdoctoral Viral Oncology Training Program



*Years 1, 2, and possibly 3: VOTG Support

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 - **Poor career development efforts**
 - **Lack of clinical cancer connection**
 - Lack of external advisory committee

Career Development Efforts

- All trainees must complete IDP (NIH mandate)
- Duke SOM 3rd → 4th year RCR/Career Dev workshop
- Duke Scholars in Molecular Medicine
 - Pairs students/postdocs with clinicians ~5h/week
 - Oncology and Infectious Diseases among others
 - Round, Clinical Journal Club, Attend Clinical Conference
- Pair with Grad School offerings
 - Certificate in College Teaching, Emerging Leaders, Science Communications
- Office of Postdoctoral Services and Duke Office of Faculty Development offerings (including K Club)
- Discussion with Advisory Committees (pre and postdocs)
- VOTP alumni return for seminars
- LinkedIn group formed

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 - **Lack of external advisory committee**

External Training Advisory Committee

- Nancy Raab-Traub, UNC-Chapel Hill
 - Expert in oncogenic herpesviruses and involved in UNC NCI T32
- David Ornelles, Wake Forest University
 - Expert in adenoviral oncoproteins
- Lou Laimins, Northwestern University
 - Expert in papillomaviruses and Chair of Microbiology Department, affiliated with NIH T32
- Convened in Aug, 2013 and May, 2015

ETAC Recommendations

- **VOTG invited speaker**
 - Speaker selection committee (3 postdoc/2 predoc)
 - First speaker will be Cliona Rooney on May 19, 2016.
- **VOTP monthly happy hours**
 - Two thus far this Fall

Institutional Support

Support from:

- Duke University School of Medicine (\$25,000)
- Department of Molecular Genetics and Microbiology (\$10,000)
- Duke Center for AIDS Research (\$10,000)
- Duke Cancer Institute (\$10,000)

Support of:

- Travel awards for VOTP trainees in non-VOTG years
 - Grant supports predocs only in year 2
- Annual Symposium in Viral Oncology
- Journal club and works in progress meetings
- VOTP social gatherings
- ETAC visits