VFHY Research and Evaluation Committee Minutes
December 4, 2019

Committee Members Present:

Pat Hughes, Chairman; Bob Leek, Lekeisha Terrell, M.D., Andre A. Muelenaer, Jr., M.D.

Committee Members Not Present: Ghulam D. Qureshi, M.D.

Staff:
Marge White, Lisa Brown

Guest: Alison Breland, Virginia Commonwealth University

Call to Order:
Pat Hughes called the meeting to order at 11:30 a.m. and asked for introductions from committee members, staff and guest.

VFHY Large Grants Review
Lisa Brown provided an update on the progress of large grants and extended an invitation to committee to attend the Virginia Youth Tobacco Project Research Coalition annual meeting on February 19 at the Delta Hotel in Richmond. Registration information will be sent when it is available.

Past Performance Analysis from Previous Grant Cycles
Alison Breland presented on the recently-completed report on the assessment of large grants funded during the past two grant cycles (see below). Dr. Breland said they evaluated the large grants for capacity building, dissemination of findings and whether the researchers accomplished the specific aims outlined in their proposals. The results were overwhelmingly positive. Dr. Breland also highlighted some recommendations for future RFPs and report formats.

Virginia Youth Survey
Marge White reported that the majority of data collection for the Fall 2019 survey has been completed at middle and high schools across the Commonwealth. Survey results should be available in January for high school and later in the spring for middle school.

Current Issues – Summary Papers

Lisa Brown shared copies of two documents produced by VCU: Alternative Tobacco Products Being Used in Virginia and Licensing Tobacco Outlets. Both documents will be emailed to board members.

An Assessment of the Virginia Foundation for Health Youth's Large Grant Research Program

J. Randy Koch, Ph.D.
Alison Breland, Ph.D.
Center for the Study of Tobacco Products
Virginia Commonwealth University

November 27, 2019

Background

In response to a request from its Board of Trustees, the Virginia Foundation for Health Youth (VFHY) requested that the Center for the Study of Tobacco Products at VCU, through its Virginia Youth Tobacco Projects (VYTP), conduct an "impact assessment" of the VFHY research grants program. This assessment was based on the VFHY "large grants" funded for the FY 2012-15 and FY 2016-18 grant periods.

We began by identifying the major goals of the program as expressed in a variety of communications and documents at the time the VFHY was established. These goals have been at least indirectly referred to numerous times over the past 15+ years in a variety of documents, reports and meetings, and many are specifically identified in the RFPs for the large and small research grants.

The goals of the research program can be grouped into two major categories, capacity building and dissemination of research findings. In addition, the VFHY Board asked that we assess whether or not the specific aims of each study were accomplished. Thus, our assessment examined the impact and operation of the grants in these three areas. The specific indicators we assessed are enumerated below.

1. Capacity Building
    a. Multi-university collaboration
    b. Multi-disciplinary
    c. Student participation (e.g., research assistants)
    d. Investigators who are new to the field of research on youth tobacco use
    e. Grant applications (number submitted and funded)

2. Dissemination of Research Findings
    a. Number of publications
    b. Number of conference presentations

3. Specific Aims Accomplished

To assess each project against the indicators listed above, we initially extracted information from several source documents, including: 1) the grant application for each project, 2) the final report for each project, and 3) annual reports by VYTP members of their grant applications, publications and conference presentations. Finally, we asked the PI for each study to review our findings to confirm the results or make changes and to provide additional information that would help us understand the results. We also asked the study PIs to describe any other accomplishments or impact they have had as a result of the VFHY grant they received.

It should be noted that we chose to be relatively conservative in our assessment of the impact and accomplishments of the VFHY research program and individual projects. For example, we only included publications and conference presentations based on data collected for the VFHY-funded study rather than all publications and conference presentations related to youth tobacco use. Similarly, we only included grant applications that either included preliminary data collected from the VFHY-funded study or cited this study in the application. The decision rules we used for reporting data are noted in each of the attached table of results.

Results

Capacity Building

As can be seen in Table 1, nearly all of the VFHY-funded projects included multi-disciplinary research teams, involved students in conducting the research (typically graduate research assistants), and involved faculty investigators who had not previously conducted research on youth tobacco use (i.e., had not been an investigator on a grant focused on youth tobacco use or published a paper in this area). In addition, two-thirds of the studies involved multi-university collaborations, although in two cases the partner university was from outside Virginia and in one case the collaborator only served on an advisory committee (i.e., was not a co-investigator). Finally, across the nine studies, there were at least 18 grant applications submitted that were intended to extend the research initiated by the VFHY grant, with 6 (33.3%) of these being funded. Grant applications included in this report were those for which the VFHY-funded project provided preliminary data for or were cited in the new grant application. It also should be noted that, particularly for the FY2016-18 grants, PIs reported that additional grant applications are planned or are “in progress.” See Table 2 for a list of grant applications submitted and funded for each VFHY grant.

Dissemination of Research Findings

As can be seen in Table 3, for the most part, VFHY-funded investigators have been very active in publishing the results of the studies and presenting those results at conferences and professional meetings. There have been a total of 29 publications based on the results of these studies and 52 presentations. However, there was a very large range for both the number of publications and presentations across the nine studies. Thus, the number of publications ranged from 0 to 7, while the number of

presentations ranged from 0 to 16. As one might have expected, the study that has yet to yield a publication (Corona & Langberg) and the study for which a conference presentation has not been made (Scott) were completed less than one year ago. A listing of the publications and presentations for each study are presented in Tables 4 and 5.

Accomplishment of Study Specific Aims

Generally, research grantees accomplished most if not all of the specific aims identified in their grant application within the project period. Four of the nine studies accomplished all of the specific aims proposed in their grant application. In one additional study (Barnes and Cobb), the final two specific aims were accomplished after the formal project period was over. This was also true for one specific aim for each of two other studies. When a specific aim was not accomplished, it was typically because the research design was modified (e.g., Brunzell), the results of the first study of a multi-study project were such that the subsequent studies were no longer relevant (e.g., Scott), or the data were collected but not analyzed (we did not determine why this may have happened).

Discussion

Overall, the VFHY-funded research program has been successful in building the capacity of Virginia's universities to conduct research on youth tobacco use. It has fostered many multi-university research collaborations, some of which continued beyond the duration of the initial research project. However, for two projects the collaborating university was in another state, which raises a question about what the expectation should be regarding such collaborations. The VFHY research program has also been successful in bringing together investigators from different disciplines, something that is highly desirable when addressing problems as complex as youth tobacco use. Also critical to building capacity is training the next generation of youth tobacco use researchers and bringing into the field experienced investigators from other areas who can contribute their expertise. Again, the VFHY research program achieved success by funding studies that had many graduate research assistants and senior investigators who had not previously been an investigator or published in the area of youth tobacco use. Finally, most of the studies led to grant applications to extend the research initially funded by VFHY, with others being planned or in process. In total, the VFHY-funded studies contributed to at least six successful grant applications. Further, while three studies have not led to any grant applications at this point in time (although some may be planned) and others have not been successful in their grant writing efforts, it should be noted that VFHY grants may still have been instrumental in helping the investigators obtain future grants. For example, their VFHY-funded projects may have given them the research experience related to youth tobacco use that they needed to obtain additional grants or it established new research teams that then collaborated on additional youth tobacco research.

In terms of dissemination of research findings, the VFHY-funded studies have been widely disseminated through publications in professional journals as well as professional meetings and conferences. In addition, while not captured in this study, the results have also been disseminated through other mechanisms such as department "grand rounds" videos and brochures. At the time of this report, only one study has not resulted in a publication (a study from FY 2016-18 for which a publication is planned) and only one study has not been presented at a professional meeting or conference. While there was wide variation in the number of publications and presentations per project, this is not unexpected. By their design, some research projects are better suited for multiple publications than others (e.g., those projects that include multiple sub-studies).

Finally, in terms of accomplishing the specific aims identified in the proposal, performance again varied quite widely. Several (5) projects did not accomplish all of their specific aims within the time-frame of their projects, even with the availability of a six-month extension. The reasons for this varied. For example some PIs reported that they completed specific aims after the formal project period, or that results from the first of a multi-study project led to the conclusion that the other planned studies could not be conducted. In other projects it appeared that study designs had been changed such that the specific aim described in the proposal could not be fully accomplished or the data were collected, but never analyzed and reported. It is also noteworthy that it was often difficult to determine from the final reports if each specific aim was accomplished, and if not, the reasons why.

Recommendations

1. Expectations regarding multi-university collaborations, multi-disciplinary research teams, participation of students (i.e., student research assistants), and the inclusion of faculty investigators new to the field of youth tobacco use research should be clarified and made explicit in the large grant request for applications (RFA). VFHY should consider using these as evaluation criteria for grant applications.

2. Expectations for disseminating the results of VFHY-funded research through publications and conference presentations as well as using the research as the basis for future non-VFHY grant applications should be made explicit in the RFA. Performance in these areas should be considered in making future awards to PIs and Co-PIs.

3. VFHY should monitor the accomplishment of each specific aim by the research grantees. If a specific aim is not accomplished within the project time period, the PI should be asked to provide a justification. If a specific aim is accomplished after the formal project period, VFHY should request an amended final report that includes new results.

4. VFHY should establish a standardized format for grantee annual progress reports that requires PIs to describe the progress on each project specific aim.

5. VFHY should establish a standardized format for grantee final reports that requires PIs to specify the proposed specific aims and the results associated with each specific aim.

6. Given the role that VFHY plays in promoting effective youth tobacco control policies and services, research proposals and final reports should address the "public health impact" of the study results, including the relevance for policy and services in Virginia. Research proposals should be evaluated, in part, on their potential public health impact.

7. Research proposals should identify opportunities for future grant funding, and this should be considered in the evaluation of each proposal.

Table 1. Evaluation Summary—Capacity Building

PI/University	Project Title	Multi-University Collaboration[a]	Multi-Disciplinary[b]	Student Participation[c]	Faculty New to Youth Tobacco Use Research[d]	Grant Application Funded/Sub-mitted
FY 2013-15 Studies						
Robert Smith, PhD, and Craig McDonald, PhD, George Mason University	Mechanisms of Adolescent Vulnerability to Neurobehavioral Effects of Nicotine	Yes	No	Yes	No	0/0
*Karl Fryxell, Ph.D., George Mason University	What social and molecular factors drive nicotine preference in adolescent mice?	Yes	Yes	Yes	Yes	0/6
Darlene H. Brunzell, PhD, Virginia Commonwealth University	Exercise and environmental enrichment to prevent nicotine addiction in adolescent males and females	Yes	Yes	No	Yes	0/0
Michael Mason, Ph.D. Virginia Commonwealth University	Reducing Teen Tobacco Use Via Text Messaging: Motivational Interviewing Integrated with Social Network Counseling	Yes (Co-Is from non-Virginia universities)	Yes	No	Yes	4/6
Rosalie Corona, PhD, Virginia Commonwealth University	Can Parents Help Prevent Youth Tobacco Use? An Evaluation of Two Evidence-based Parenting Programs	No	Yes	Yes	Yes	0/2
FY 2016-18 Studies						
Kelli Will, PhD, Eastern Virginia Medical School	Examining E-Cigarette Use: Developing Effective Risk Communication Methods to Reach Virginia Youth	No	Yes	Yes	Yes	0/1 Pending

PI/University	Project Title	Multi-University Collaboration[a]	Multi-Disciplinary[b]	Student Participation[c]	Faculty New to Youth Tobacco Use Research[d]	Grant Application Funded/Sub-mitted
Michael Scott, PhD, University of Virginia	Characterization of Nicotine Vapor Intake in Adolescent Mice	Yes	Yes	Yes	No	0/1
Rosalie Corona, PhD and Joshua Langberg, PhD Virginia Commonwealth University	Integrating Tobacco Prevention Strategies into Behavioral Parent Training for Adolescents with ADHD	No	Yes	Yes	Yes	0/0
Andrew Barnes, PhD and Caroline Cobb, Ph.D. Virginia Commonwealth University	Categorization and Effects of E-Cigarette Ads on Attitudes, Intentions and Abuse Liability in Youth	Yes Co-I from non-Virginia university, and JMU faculty who served on advisory board	Yes	Yes	Yes	2/3
TOTAL		**6/9 (66.7%)**	**8/9 (88.9%)**	**7/9 (77.8%)**	**7/9 (77.8%)**	**6/18 (33.3%)**

*This PI did not respond to our request for information about his/her VFHY-funded project. As a result, we cannot confirm that the grants, publications and presentations were based on this project.

[a]Based on staff identified in the budget and/or letters of agreement, including paid or unpaid collaborators. Faculty collaborators from non-Virginia universities are noted.

[b]Based on staff identified in the budget and/or letters of agreement, including paid or unpaid collaborators. Includes investigators from different fields within the same discipline. For example, a collaboration between a clinical psychologist and social psychologist would be considered multi-disciplinary.

[c]Based on staff identified in the budget.

[d]Based only on faculty from Virginia universities.

Table 2. Evaluation Summary—Grant Applications

PI/University	Project Title	Grant Applications[a]
FY 2013-15 Studies		
Robert Smith, PhD, and Craig McDonald, PhD, George Mason University	Mechanisms of Adolescent Vulnerability to Neurobehavioral Effects of Nicotine	
Karl Fryxell, Ph.D., George Mason University	What social and molecular factors drive nicotine preference in adolescent mice?	**Submitted—Not Funded** Source: NIH, with funding to be provided by FDA 1P50 CA180889-01 P.I.: **Fryxell, K. J.** Title: "GMU Center for Tobacco Research". Project Period: 9/1/13 – 8/31/18. Annual Direct Cost: $1,739,728 Source: NIDA/NIH PI: **Fryxell** Title: Development of dopamine sensors for adolescent mice Source: Commonwealth Health Research Board. P.I.: **Fryxell** Title: How adolescents become nicotine dependent: the roles of CRF, dopamine signaling, and withdrawal symptoms. Specific Aims: A key aim is to understand adult vs. adolescent differences in nicotine dependence. We will determine the roles of CRF and dopamine

PI/University	Project Title	Grant Applications[a]
		signaling in causing nicotine dose escalation and nicotine withdrawal symptoms in both adult and adolescent mice. Project Period: 7/01/2016 to 6/30/2018. Annual Direct Cost: $150,000 Source: W. M. Keck Foundation P.I.: N. Peixoto, **Fryxell** Title: Multi-Parametric Analysis of Neurological Systems Specific Aims: We propose to develop a unique platform to probe living neurons and glial cells in their natural environment at length and time scales matching their sub-cellular mechanisms. Our platform will deliver the whole metabolomic profiling of redox-active metabolites, unveiling and decoding molecular network interactions and signaling pathways. Project Period: 7/01/2017 to 6/30/2020 Annual Direct Cost: $670,000 Role: Co-Investigator Source: NIDA/NIH P.I.: **Fryxell** Title: Analysis of cell-type-specific and sex-specific effects of the tetraspanin Cd81 on nicotine consumption and emotional behavior. Specific Aims: Transgenic expression of Cd81 in specific brain areas in mice, and analysis of the behavioral results for nicotine consumption and emotional behavior. Project Period: 10/1/17 to 9/30/19 Annual Direct Cost: $50,000 Source: Center for the Study of Tobacco Products (VCU) P.I.: **Fryxell** Title: The topography of mouse oral nicotine consumption: An animal model for alternative tobacco products Specific Aims: Utilize electronic lickometers in a mouse 4-bottle choice test to analyze the effects of e-cigarette flavorings on oral preference for nicotine and the progression to nicotine dependence. Project Period: 9/1/17 to 8/31/18 Annual Direct Cost: $50,000
Darlene H. Brunzell, PhD, Virginia Commonwealth University	Exercise and environmental enrichment to prevent nicotine addiction in adolescent males and females	
Michael Mason, Ph.D. Virginia Commonwealth University	Reducing Teen Tobacco Use Via Text Messaging: Motivational Interviewing Integrated with Social Network Counseling	**Submitted—Not Funded** Source: NIH - NIDA P.I.: Michael Mason, PhD Title: Targeting teen dating violence in emergency departments to prevent substance use Specific Aims: Test the efficacy of a text-delivered Motivational Interviewing with Social Network counseling intervention aimed at reducing substance use among adolescents experiencing dating violence victimization. Test the extent to which TDV severity interacts with the intervention influencing substance use. Test the extent that peer network risk mediates the intervention effects on substance use and secondarily TDV. Project Period: 4/2015- 3/2020 Annual Direct Cost: $485,320

PI/University	Project Title	Grant Applications[a]
		Source: National Cancer Institute P.I.: **Mason** Title: Mobile Health Method to Reduce Urban Adolescent Smoking in Health Care Settings Project Period: 9/16-8/21 Annual Direct Cost: 2,565,715 **Funded Grant Applications** Source: NIH - NIDA P.I.: Michael Mason, PhD Title: Motivational interviewing integrated with social network counseling for teens Specific Aims: To assess the feasibility and success of recruiting and offering a brief, indicated preventive intervention within public primary care settings using digital assessment and feedback. To assess the efficacy of MIʃSN compared to an attention control condition on substance use. To assess the effects of a MIʃSN on referral to and time in substance use counseling compared to an attention control condition. Project Period: 7/2012 -6/2015 Annual Direct Cost: $190,000 Source: NIH - NIDA P.I.: Michael Mason, PhD Title: Social-spacial risk and protective mechanisms in urban adolescent substance use Specific Aims: Test the extent to which individual personal social network quality (risk/protection) moderates the effects of neighborhood-level predictors (concentrated disadvantage, low education and employment, high public assistance, drug related crime, alcohol availability) on adolescent substance use. Test the extent to which individual network quality mediates the effects of mental health predictors (internalizing disorders, parental relations, school adjustment and sensation seeking, dysregulation, PTSD, and antisocial behavior) influences on adolescent substance use. Examine contextual effects on selection and influence processes on substance use, with particular focus on structural tendencies, neighborhood characteristics, and activity spaces. Project Period: 4/2012 - 3/2017 Annual Direct Cost: $370,418 Source: NIH, National Institute on Drug Abuse PI: Mason, M. J. Title: Social-spatial Risk and Protective Mechanisms in Urban Adolescent Substance Use Specific Aims: To model the personal, social, and environmental mechanisms in substance use outcomes for urban youth in order to build scientifically driven preventive interventions. Through a longitudinal design, we will identify specific spatial mechanisms that interact with place-based social networks and psychological functioning, producing an integrated analysis of urban youth risk behavior across multiple levels and time points. Project Period: 4/1/2012 - 3/31/2017 Direct costs: $347,268 Source: National Cancer Institute PI: Coffman, D. Consultant: Mason, M.J. Title: Developing Methodology to Examine Causal Mediation of Time-Varying Effects in Smoking Cessation Treatments. 1R01CA229542-01. Project Period: 8/18 – 7/22.
Rosalie Corona, PhD,	Can Parents Help Prevent	**Submitted—Not Funded**

PI/University	Project Title	Grant Applications[a]
Virginia Commonwealth University	Youth Tobacco Use? An Evaluation of Two Evidence-based Parenting Programs	Source: National Institute on Drug Abuse P.I.: Rosalie Corona, PhD Title: Testing the Strengthening Families Program for youth with mental health problems Specific Aims: The overall goal of the proposed project is to determine the efficacy of an evidence-based, family focused program for decreasing adolescent substance use, intentions to use substances and other risk behaviors by increasing parental monitoring, improving parent-child communication about substance use and improving the parent-child relationship in a sample of adolescents with mental health problems. Project Period: 09/2014-08/2017 Annual Direct Cost: $149,556 (Year 1); $162,828 (Year 2); $137, 254 (Year 3) Source: NIDA PI: Corona Title: Testing the Strengthening Families Program for youth with ADHD Specific Aims: Primary Aim 1: Given our focus on substance use prevention, the young age of the sample, and the R34's timeframe, the primary aim focuses testing the impact of the SFP 10-14 on proximal outcomes: adolescent skills; parenting skills; and the family relationship. Secondary Aim 2: Assess whether the intervention has an impact on SFP-targeted distal outcomes. Secondary Aim 3: Test the SFP 10-14's underlying theory of change by evaluating whether theoretically important components of our behavior change model mediate the intervention's impact on substance use for adolescents with ADHD. Project Period: 7/1/2015-6/30/2018 Annual Direct Cost: $150,000
FY 2016-18 Studies		
Kelli Will, PhD, Eastern Virginia Medical School	Examining E-Cigarette Use: Developing Effective Risk Communication Methods to Reach Virginia Youth	**<u>Pending Grant Applications:</u>** Source: American Cancer Society PI: Harrell; Co-I: England (former name Will) Title: Young adult e-cigarette beliefs and behaviors (YA ECIG) Specific Aims: The study uses a longitudinal approach involving a young adult cohort and a Randomized Controlled Trial (RCT) to expand upon prior measure development and risk communication research. The first two waves of the study will assess naturalistic changes in expectancies, predictive validity, and the impact of tobacco product advertising. In the second and third waves of the study, a RCT will examine the impact of an e-cigarette prevention campaign (as compared to control) on the measures and tobacco product use trajectories. Project Period: Total requested: $792,000
Michael Scott, PhD, University of Virginia	Characterization of Nicotine Vapor Intake in Adolescent Mice	**<u>Submitted—Not Funded</u>** Source: NIH Pathway to Independence Award (Parent K99/R00) P.I.: Bagdas, Damaj Title: Impact of menthol flavor on nicotine intake and reward: mechanistic basis and neurocircuitry of the interaction Specific Aims: Aim 1. To determine whether menthol influences nicotine-induced DA release in NAc. Aim 2: To determine the role of VTA DA neurons and NAc cholinergic interneurons in menthol-related changes on nicotine consumption. Aim 3: To determine whether menthol alters neurocircuitry characterized by chronic nicotine exposure. Project Period: 04/01/18 to 03/31/23 Annual Direct Cost: Year 1: $105,915.00; Year 2: $108,175.00; Year 3:

PI/University	Project Title	Grant Applications[a]
		$230,556.00; Year 4: $230,556.00; Year 5: $230,556.00. (Total direct and indirect cost: $978,217.00)
Rosalie Corona, PhD and Joshua Langberg, PhD Virginia Commonwealth University	Integrating Tobacco Prevention Strategies into Behavioral Parent Training for Adolescents with ADHD	
Andrew Barnes, PhD, and Caroline Cobb, PhD, Virginia Commonwealth University	Categorization and Effects of E-Cigarette Ads on Attitudes, Intentions and Abuse Liability in Youth	**Submitted—Not Funded** Source: National Institute on Drug Abuse PI: **Barnes, Cobb** Title: Effects of the NIDA Standardized Research E-Cigarette on Consumption, Toxicant Exposure and Associated Health Effects, and Abuse Liability Specific Aims: The proposed research uses a rigorous clinical experimental design to examine the ability of CTC users to switch to nicotine/placebo ECIGs and impact on patterns of dual CTC/ECIG use, health risk endpoints, and ECIG abuse liability compared with CTCs. Project Period: 2017-2019. Annual Direct Cost: $918,000 (direct costs). **Funded Grant Applications** Source: National Institute on Drug Abuse PI: **Barnes, Cobb** Title: Effects of cigar flavors on measures of abuse liability among young adults Specific Aims: Flavored cigars have been linked to increased sales and consumption, with the largest increases among youth/young adults and certain racial/ethnic minorities. This study will provide important evidence regarding the abuse liability of cigar flavors that is critical to inform the impending federal regulations of cigars and other flavored tobacco products. Project Period: 2016-2018. Annual Direct Cost: $150,000 (direct costs). Source: Massey Pilot M.P.I.: **Cobb & Barnes** Title: Profiling cancer risks associated with cigar use in low SES communities: A mixed methods approach Specific Aims: The proposed study will provide an in-depth physiological, psychological, and behavioral characterization of adults at risk for negative health outcomes associated with cigar use that can be used to inform prevention and policy efforts in low SES communities. Project Period: 05/01/2018-04/31/2019 Annual Direct Cost: $50,000

[a]Included new grant applications that built on the VFHY-funded study. That is, the VFHY provided preliminary data for or was cited in the new application.

Table 3. Evaluation Summary—Dissemination

PI/University	Project Title	Published Results	Presented at Conference
FY 2013-15 Studies			
Robert Smith, PhD, and Craig McDonald, PhD, George Mason University	Mechanisms of Adolescent Vulnerability to Neurobehavioral Effects of Nicotine	6	14
Karl Fryxell, Ph.D.,	What social and molecular factors	1	5

PI/University	Project Title	Published Results	Presented at Conference
George Mason University	drive nicotine preference in adolescent mice?		
Darlene H. Brunzell, PhD, Virginia Commonwealth University	Exercise and environmental enrichment to prevent nicotine addiction in adolescent males and females	6	1
Michael Mason, Ph.D. Virginia Commonwealth University	Reducing Teen Tobacco Use Via Text Messaging: Motivational Interviewing Integrated with Social Network Counseling	7	1
Rosalie Corona, PhD, Virginia Commonwealth University	Can Parents Help Prevent Youth Tobacco Use? An Evaluation of Two Evidence-based Parenting Programs	1	1
FY 2016-18 Studies			
Kelli Will, PhD, Eastern Virginia Medical School	Examining E-Cigarette Use: Developing Effective Risk Communication Methods to Reach Virginia Youth	3	12
Michael Scott, PhD, University of Virginia	Characterization of Nicotine Vapor Intake in Adolescent Mice	1	0
Rosalie Corona, PhD and Joshua Langberg, PhD Virginia Commonwealth University	Integrating Tobacco Prevention Strategies into Behavioral Parent Training for Adolescents with ADHD	0	2
Andrew Barnes, PhD and Caroline Cobb, PhD, Virginia Commonwealth University	Categorization and Effects of E-Cigarette Ads on Attitudes, Intentions and Abuse Liability in Youth	4	16

Note: Assumed that any publication or conference presentation would include the PI(s) as an author.

Table 4. Evaluation Summary—Publications

PI/University	Project Title	Publications[a]
FY 2013-15 Studies		
Robert Smith, PhD, and Craig McDonald, PhD, George Mason University	Mechanisms of Adolescent Vulnerability to Neurobehavioral Effects of Nicotine	Wheeler, T., Smith, L. N., Bachus, S. E., **McDonald, C. G., Fryxell, K. J.,** Smith, R. F. (2013) Low-dose adolescent nicotine and methylphenidate have additive effects on adult behavior and neurochemistry. *Pharmacology, Biochemistry and Behavior,103*, 723-734. Falco, A.M., **McDonald, C.G.,** Bachus, S.E., & **Smith, R.F.** (2014). Developmental alterations in locomotor and anxiety-like behavior as a function of D1 and D2 mRNA expression. *Behavioural Brain Research*, *260*, 25-33. Falco, A., **McDonald, C.G.**, **Smith, R.F.** Anxiety status affects nicotine- and baclofen-induced locomotor activity, anxiety, and single-trial conditioned place preference in male adolescent rats. *Developmental Psychobiology*, *56(6)*, 1352-1364. Smith, L.N., Bachus, S.E., **McDonald, C,G.**, **Smith, R.F.** (2015). Role of the D3 dopamine receptor in nicotine sensitization. *Behavioural Brain Research*, *289*, 92-104. Falco, A.M., **McDonald, C.G., Smith, R.F.** (2014). Anxiety status affects nicotine- and baclofen-induced locomotor activity, anxiety, and single-trial conditioned place preference in male adolescent rats. Dev Psychobiol. 56(6), 1352-64. Ehlinger, DG., Burke, J.C., **McDonald, C.G**., **Smith, R.F.**, Bergstrom, H.C. (2017). Nicotine-induced and D1-receptor-dependent dendritic remodeling in a subset of dorsolateral striatum medium spiny neurons. *Neuroscience, 356,* 242-254.
Karl Fryxell, Ph.D., George Mason University	What social and molecular factors drive nicotine preference in adolescent mice?	Hudson, A. D., Murphy, R.L. & **Fryxell, K.J.** (2016). *Nicotine consumption is strongly influenced by social interactions in male, but not female, adolescent mice.* Society for Neuroscience Abstracts, 549.20.
Darlene H. Brunzell, PhD, Virginia Commonwealth University	Exercise and environmental enrichment to prevent nicotine addiction in adolescent males and females	Sanchez, V., Moore, C.F., **Brunzell, D.H.**, & **Lynch, W.J.** (2013). Effect of wheel-running during abstinence on subsequent nicotine-seeking in rats. *Psychopharmacology*, *227*(3):403-11. Sanchez, V., Moore, C. F., **Brunzell, D. H.**, & **Lynch, W. J.** (2013a). Effect of wheel-running during abstinence on subsequent nicotine-seeking in rats. *Psychopharmacology*, 1-9. Sanchez, V., Moore, C.F., **Brunzell, D.H., Lynch, W.J.** (2014). Sex differences in the effect of wheel running on subsequent nicotine-seeking in a rat adolescent-onset self-administration model. *Psychopharmacology, 231(8)*,1753-62. Sanchez, V., Lycas, M. D., **Lynch, W. J**., & **Brunzell, D. H.** (2015). Wheel running exercise attenuates vulnerability to self-administer nicotine in rats. *Drug and Alcohol Dependence*, *156*, 193-198. Sanchez, V, Bakhti-Suroosh, A, Chen, A, **Brunzell, DH**, Erisir, A, & **Lynch, WJ**. (2019, March 19). Exercise during abstinence normalizes ultrastructural synaptic plasticity associated with nicotine-seeking following extended access self-administration. *European Journal of Neuroscience*, DOI: 10.1111/ejn.14408

PI/University	Project Title	Publications[a]
		Lynch WJ, Tan, L, Narmeen, S, Beiter, R, & **Brunzell, DH**. (2019, May). Exercise or saccharin during abstinence block estrus-induced increases in nicotine-seeking. *Physiology and Behavior*, 201(1), 33-41. DOI: 10.1016/j.physbeh.2017.10.026
Michael Mason, Ph.D. Virginia Commonwealth University	Reducing Teen Tobacco Use Via Text Messaging: Motivational Interviewing Integrated with Social Network Counseling	**Mason, M.**, Mennis, J., Way, T., Zaharakis, N., Campbell, L. F., Benotsch, E. G., **Keyser-Marcus, L.**, & King, L. (2016). Text message delivered peer network counseling for adolescent smokers: A randomized controlled trial. The *Journal of Primary Prevention*, 37(5), 403-420. PMID: 27388626 Mennis, J., & **Mason, M. J.** (2016). Tobacco outlet density and attitudes towards smoking among urban adolescent smokers. *Substance Abuse*, 37(4), 521-525. PMID: 27171155 Mennis, J., **Mason, M.**, Way, T., & Zaharakis, N. (2016). The role of tobacco outlet density in a smoking cessation intervention for urban youth. *Health & Place*. 38, 39-47.DOI:10.1016/j.healthplace.2015.12.008 **Mason, M. J.**, Mennis, J., Zaharakis, N., & Way, T. (2016). The dynamic role of urban neighborhood effects in a text-messaging adolescent smoking intervention. *Nicotine & Tobacco Research*. 18(5), 1039-1045. PMID: 26547062 **Mason, M.J.**, Campbell, L., Way, T., **Keyser-Marcus, L.**, Benotsch, E.G., Mennis, J., Zhang, J., King, L., May, J., & Stembridge, D. (2015). Development and outcomes of a text messaging tobacco cessation intervention with urban adolescents. *Substance Abuse*, 36(4), 500-506. DOI: http://dx.doi.org/10.1080/08897077.2014.987946 **Mason, M.** J., Mennis, J., Way, T., Lanza, S., Russell, M., & Zaharakis, N. (2015). Time-varying effects of a text-based smoking cessation intervention for urban adolescents. *Drug and Alcohol Dependence*.157, 99-105. PMCID: PMC4831210 **Mason, M.** J., Mennis, J., Way, T. & Campbell, L. (2015) Real-time readiness to quit and peer smoking within a text message intervention for adolescent smokers: Modeling mechanisms of change. Journal of Substance Abuse Treatment, 59, 67-73. PMID: 26297323
Rosalie Corona, PhD, Virginia Commonwealth University	Can Parents Help Prevent Youth Tobacco Use? An Evaluation of Two Evidence-based Parenting Programs	Smokowski, P., **Corona, R.**, Bacallao, M., Marshall, K., Fortson, B. & Yaros, A. (2018). Addressing barriers to recruitment, retention, and implementation of parenting programs: Lessons learned for effective program delivery in rural and urban areas. *Journal of Child and Family Studies, 27*, 2925-2942.
FY 2016-18 Studies		
Kelli Will, PhD, Eastern Virginia Medical School	Examining E-Cigarette Use: Developing Effective Risk Communication Methods to Reach Virginia Youth	**Will, K. E.**, Edwards, A. L., **Harrell, P. T.**, Yilmaz, B. O., Libby, E. P., Mondejar, K. A., Paulson, A. C., Plunk, A. D., & Herman, M. C. (2018). Development and initial validation of a risk behavior diagnosis scale for e-cigarette use. In R. Umstattd Meyer (ed.), Proceedings of the American Academy of Health Behavior 2018 Annual Scientific Meeting: An Equity Approach to Health Behavior Innovations. *Health Behavior Research: Vol. 1: No. 2, p. 46.* **Will, K. E.**, Mondejar, K. A., Paulson, A. C., Herman, M. C. (2017). Adolescent Perceptions and Experiences Regarding Electronic Nicotine Delivery Systems (ENDS): Recommendations for Intervention Development. Proceedings of the 17th Annual Meeting of the American Academy of Health Behavior. *Health Behavior Research: Vol. 1: No. 1, p. 11.*

PI/University	Project Title	Publications[a]
		England, K., Edwards, A. L., Paulson, A. C., Harrell, P. T., & Libby, E. P. (2019). Rethink Vape: Development and evaluation of a risk communication campaign for e-cigarettes. In M. Reed (Ed.), "The American Academy of Health Behavior 2019 Annual Scientific Meeting: Theory and Applications of Multiple Health Behavior Change" (p. 10*), Health Behavior Research: Vol. 2: No. 2*. https://doi.org/10.4148/2572-1836.1048
Michael Scott, PhD, University of Virginia	Characterization of Nicotine Vapor Intake in Adolescent Mice	Bagdas, D., Cam, B., Gul, Z., Scott, M.M., Tyndal, R.F., Buyukuysal, R.L. & **Damaj, M.I.,** (2019). Impact of Menthol on Oral Nicotine Consumption in Female and Male Sprague Dawley Rats*. Nicotine & Tobacco Research. doi.org/10.1093/ntr/ntz019*
Rosalie Corona, PhD and Joshua Langberg, PhD Virginia Commonwealth University	Integrating Tobacco Prevention Strategies into Behavioral Parent Training for Adolescents with ADHD	
Andrew Barnes, PhD and Caroline Cobb, PhD, Virginia Commonwealth University	Categorization and Effects of E-Cigarette Ads on Attitudes, Intentions and Abuse Liability in Youth	**Barnes A. J.,** Bono, R.S., Lester, R.C., **Eissenberg T.E.**, **Cobb, C.O.** (2017). Effect of flavors and modified risk messages on e-cigarette abuse liability. *Tobacco Regulatory Science*, *3*(4), 374-387. Bono RS, **Barnes AJ**, Lester RC, **Cobb CO**. Effects of electronic cigarette liquid flavors and modified risk messages on perceptions and subjective effects of e-cigarettes. *Health Education Behavior*. 2019;46(2):197-203. doi: 10.1177/1090198118806965 Nicksic, N. E., Snell, L. M., **Barnes, A. J.** (2017). Does exposure and receptivity to e-cigarette advertisements relate to e-cigarette and conventional cigarette use behaviors among youth? Results from wave 1 of the Population Assessment of Tobacco and Health study. *Journal of Applied Research on Children: Informing Policy for Children at Risk*, *8*(2), 1-18. Nicksic, NE, Brosnan, PH, Chowdhury, N, **Barnes, AJ** & **Cobb, CO.** (2019). "Think it. Mix it. Vape it.": A Content Analysis on E-Cigarette Radio Advertisements, *Substance Use & Misuse*, DOI: 10.1080/10826084.2019.1581219

[a]Does not include manuscripts reported only as "submitted," "under review" or "in progress."

Table 5. Evaluation Summary—Conference Presentations

PI/University	Project Title	Conference Presentations[a]
FY 2013-15 Studies		
Robert Smith, PhD, and Craig McDonald, PhD, George Mason University	Mechanisms of Adolescent Vulnerability to Neurobehavioral Effects of Nicotine	Alvarado, J., Fernandez, G., & **Smith, R**.(2013).*The Role of the Alpha-1 Adrenoceptors in the acquisition of one trial of nicotine conditioned place preference in adolescent rats.* National Conference on Undergraduate Research, UW-Lacrosse. Ehlinger, D.G., Bergstrom, H.C., Ismail, A., **McDonald, C.G.,** & **Smith, R.F.** (2013, February). *Adolescent Nicotine Alters Hippocampal Neuron Morphology*. Winter Conference on Animal Learning and Behavior, Winter Park, Colorado. Ehlinger, D.G., Bergstrom, H.C., Ismail, A., **McDonald, C.G.,** & **Smith, R.F.** (2013, February). *Adolescent Nicotine Alters Hippocampal Neuron Morphology*. Winter Conference on Animal Learning and Behavior, Winter Park, Colorado. Brown, K.C., Taylor, K.A., Ehlinger, D.G., Fernandez, G.M., **McDonald, C.G.,** Battaglia, M., & **Smith, R.F.** (2012, October).*The effects of adolescent nicotine exposure on dendritic morphology in the bed nucleus of the striaterminalis*. Annual meeting of the Society for Neuroscience, New Orleans. Ehlinger, D.G., Ismail, A., **McDonald, C.G.,** Chrosniak, L.D., Bergstrom, H.C., **Smith, R.F.** (2012, October). *Nicotine alters hemispheric asymmetry of dendrite morphology in the dentate gyrus of adolescent rats*. Annual meeting of the Society for Neuroscience, New Orleans, LA. Falco, A.M., **McDonald, C.G.,** & **Smith, R.F.** (2012, October). *Anxiety-like behavior predicts single-trial nicotine conditioned place preference in adolescent rats.* Annual meeting of the Society for Neuroscience, New Orleans, LA. Fernandez, G.M., Brooks-Faulconer, T.R., & **Smith, R.F.** (2012, October). *The effect of ERK inhibition on one-trial nicotine conditioned place preference in adolescent rats*. Annual meeting of the Society for Neuroscience, New Orleans, LA. Fernandez, G.M., Alvarado, D. J., & **Smith, R.F.** (2013, March). *The effect of á1- adrenoreceptor antagonism on one- trial nicotine conditioned place preference in adolescent rats.* Behavior, Biology & Chemistry Conference, San Antonio, TX. Taylor, K.A., Holliday, E.D., Brown, K.C., & **Smith, R.F.** (2012, October).*Nicotine withdrawal-induced anxiety in adolescence and adulthood*. Annual meeting of the Society for Neuroscience, New Orleans, LA. Ehlinger, D.G., Burke, J.C., Fernandez, G.M., **McDonald, C.G.**, Bergstrom, H.C., Chrosniak, L.D., & **Smith, R.F.** (November, 2013). *Nicotine alters hemispheric asymmetry of dendrite morphology in the dentate gyrus of adolescent rats*. Annual Meeting of the Society for Neuroscience. San Diego, CA. Fernandez, G. M., Bergstrom, H.C., **McDonald, C.G., Smith, R.F.** (November, 2013). T*he role of innate anxiety- like behavior, age and mapk signaling on one-trial nicotine conditioned place preference*. Annual Meeting of the Society for Neuroscience. San Diego, CA.

		Smith, R.F. (November, 2013). *Adolescent nicotine induces persisting alterations in dendritic structure and connectivity in neural areas linked to addiction*. Annual Meeting of the International Society for Developmental Psychobiology. San Diego, CA. **Smith, R.F**. (February, 2014) *Adolescent vulnerability to immediate and long-term nicotine effects*. Virginia Commonwealth University, Virginia Youth Tobacco Projects Research Coalition Meeting. Richmond, VA. **Smith, R.F., McDonald, C.** (February, 2014*). Adolescent nicotine: From the first experience to neural remodeling.* Virginia Commonwealth University, Virginia Youth Tobacco Projects Research Coalition Meeting. Richmond, VA.
Karl Fryxell, Ph.D., George Mason University	What social and molecular factors drive nicotine preference in adolescent mice?	Murphy, R. L., Locklear, L.L., Niaz, M.H., Walton, R. and **Fryxell, K.J.** (November, 2013). *Loss of Cd81 function increases nicotine preference, but decreases depression- and anxiety-like behavior in mice*. Society for Neuroscience. Meeting Planner Online 545.14. San Diego, CA. Murphy, R. L., Locklear, L.L., Niaz, M.H., Walton, R. and **Fryxell, K.J.** (November, 2013). *Loss of Cd81 function increases nicotine preference, but decreases depression- and anxiety-like behavior in mice*. Society for Neuroscience. Meeting Planner Online 545.14. San Diego, CA. Hallenberg, R. T, N. S. Dharker & **K. J. Fryxell** (2014, November) *The gene expression response of Snca and Cdk5 to nicotine dosing is adolescent-specific and correlates with nicotine preference*. *Soc. Neurosci. Meeting Planner Online 619.13* Washington DC. Hudson, A. D., R. T. Hallenberg, N. S. Dharker & **K. J. Fryxell** (2015, March). *The gene expression response of Snca and Cdk5 after nicotine injections is adolescent-specific and correlates with nicotine preference.* 2015 Virginia Forum on Tobacco Use, Richmond, VA. Murphy, R.L. & **Fryxell, K.J.** (2015, October) *Sex-specific lateralization of mesocorticolimbic dopamine receptor mRNAs in adolescent mice*. Soc. Neurosci. Meeting Planner Online 180.07. Chicago, Il.
Darlene H. Brunzell, PhD, Virginia Commonwealth University	Exercise and environmental enrichment to prevent nicotine addiction in adolescent males and females	**Lynch, W**. (2016, April*). Mechanisms for the efficacy of exercise as an intervention for drug addiction*. Invited Speaker, and Session Co-Chair: *Neurobiology of Exercise in Drug Abuse and Neurodegenerative Diseases*. Annual Meeting of the Society on NeuroImmune Pharmacology (SNIP), Krakow, Poland.
Michael Mason, Ph.D. Virginia Commonwealth University	Reducing Teen Tobacco Use Via Text Messaging: Motivational Interviewing Integrated with Social Network Counseling	**Mason, M.,** Campbell, L., Zhang, J., King. L., Way. T., Mennis, J., **Keyser-Marcus, L.,** & Benotsch, E. (May, 2014). R*educing teen tobacco use via text messaging: Motivational interviewing (mi) integrated with social network counseling*. Paper presented at the Society for Prevention Research annual meeting, Washington, D.C.
Rosalie Corona, PhD, Virginia Commonwealth University	Can Parents Help Prevent Youth Tobacco Use? An Evaluation of Two Evidence-based Parenting Programs	Romo, S., Parks, A.M., Avila, M., Hernandez, R., Vazquez, G., Graves, K., & **Corona, R.** (May, 2019). *The influence of emotional regulation on the relationship between parental and adolescent depressive symptoms in African-American families*. Poster presented at the Society for Prevention Research, San Francisco, CA.
FY 2016-18 Studies		
Kelli Will, PhD, Eastern	Examining E-Cigarette Use:	**Will, K. E.,** Mondejar, K. A., Paulson, A. C., & Herman, M. C. (2017,

Virginia Medical School	Developing Effective Risk Communication Methods to Reach Virginia Youth	March). *Adolescent perceptions and experiences regarding Electronic Nicotine Delivery Systems (ENDS): Recommendations for intervention development.* Poster presentation for 17th Annual Meeting of the American Academy of Health Behavior, Tucson, AZ. **Harrell, P.T.,** Brandon, T.H., **Will, K.E.**, Brockenberry, L., & Smith, J. (2017, November). *Adolescent e-cigarette expectancies*. Annual Virginia Youth Tobacco Project conference, Norfolk, VA, USA. **Harrell, P.T**., **Will, K.E.**, Plunk, A.D., Brockenberry, L., & Smith, J. (2018, June). *Electronic nicotine delivery systems and social media use among young adult college students*. College on Problems of Drug Dependence, San Diego, CA, USA. **Will, K.E.**, Edwards, A.L., **Harrell, P.T.**, Libby, E.P., Mondejar, K.A., Paulson, A.C., Plunk, A.D., & Herman, M.C. (2018, March). *Development and initial validation of a risk behavior diagnosis scale for e-cigarette use.* American Academy of Health Behavior, Portland, OR, USA. **Will, K. E.**, Edwards, A., Libby, E., **Harrell, P. T**., Paulson, A., Mondejar, K, & Herman, M. (2018, April). *Risk communication the adolescent way: Insights for e-cigarette prevention.* Oral presentation for the 2018 Reduce Tobacco Use Conference, Norfolk, VA. **Will, K. E.**, Edwards, A. L., **Harrell, P. T**., Yilmaz, B. O., Libby, E. P., Mondejar, K. A., Paulson, A. C., Plunk, A. D., & Herman, M. C. (2018, March). *Development and initial validation of a risk behavior diagnosis scale for e-cigarette use*. Poster presentation for the American Academy of Health Behavior 2018 Annual Scientific Meeting, Portland, Oregon. Yilmaz, B., **Will, K. E.**, Edwards, A. L., **Harrell, P. T.**, Libby, E. P., Mondejar, K. A., Paulson, A. C., Plunk, A. D., & Herman, M. C. (2018, March)*. Development and initial validation of a risk behavior diagnosis scale for e-cigarette use.* Poster presentation for the Virginia Youth Tobacco Conference, Richmond, VA. **England, K.J.,** Edwards, A.L., Paulson, A.C., Harrell, P.T., Libby, E.P. (2019, March) *Rethink Vape: Development and Evaluation of a Risk Communication Campaign for E-cigarettes*. American Academy of Health Behavior, Greenville, South Carolina, USA. **England, K.J**., Edwards, A., Paulson, A., Mondejar, K., Harrell, P., & Libby, E. (2018, November). *Rethink Vape: Communicating Risk to Teens*. Regional Tobacco Summit. Norfolk, Virginia. Harrell, P.T., **England, K.J.,** Brockenberry, L.O.,* Phillips, J.* (2018, December*). Electronic Nicotine Delivery Systems. Regional Tobacco Use Summit*, Norfolk, VA, USA. Oral presentation. **England, K.J.,** Edwards, A. L., Paulson, A., (2018, December). *Rethink Vape: Communicating Risk to Teens. Regional Tobacco Use Summit*, Norfolk, VA, USA. Oral presentation. **Will, K. E.,** Mondejar, K., Paulson, A., Herman, M., Plunk, A. (2017, March). *Examining E-Cigarette Use: Developing Effective Risk Communication Methods to Reach Virginia Youth*. Invited presentation to the Eastern Regional Tobacco Use Control Meeting, Portsmouth, Virginia.
Michael Scott, PhD,	Characterization of Nicotine Vapor	

University of Virginia	Intake in Adolescent Mice	
Rosalie Corona, PhD and Joshua Langberg, PhD, Virginia Commonwealth University	Integrating Tobacco Prevention Strategies into Behavioral Parent Training for Adolescents with ADHD	Romo, S., Parks, A., Velazquez, E., Edgar, K., **Langberg, J**., & **Corona, R**. (2018, May). *Integrating substance use prevention messages into an evidence-based ADHD behavioral intervention: Parent and youth satisfaction*. Poster presented at Society for Prevention Research, Washington, D.C. Linkous, O., Romo, S., & **Corona, R.** (2019, April). *Is parental academic involvement related to family cohesion among families of adolescents with ADHD?* Poster presented at the National Conference on Undergraduate Research, Kennesaw, GA.
Andrew Barnes, PhD and Caroline Cobb, PhD, Virginia Commonwealth University	Categorization and Effects of E-Cigarette Ads on Attitudes, Intentions and Abuse Liability in Youth	Hoetger C, Rudy A, Bono R, **Barnes AJ**, **Cobb C**. Youth susceptibility to electronic cigarettes after exposure to electronic cigarette advertisements. Poster presented at the annual meeting of the Society for Research on Nicotine and Tobacco; February 20-24, 2019; San Francisco, CA, USA **Barnes AJ**, Rudy AK, Hoetger C, Nicksic NE,Bono RS, **Cobb CO**. Exposure to tobacco advertisements and abuse liability for e-cigarettes among adolescents. Poster presented at the annual meeting of the Society for Research on Nicotine and Tobacco; February 20-24, 2019; San Francisco, CA, USA. Bono RS, Rudy AK, Hoetger C, Nicksic NE, **Cobb CO**, **Barnes AJ**. Youth are less sensitive to electronic cigarette prices after exposure to electronic cigarette advertisements. Poster presented at the annual meeting of the Society for Research on Nicotine and Tobacco; February 20-24, 2019; San Francisco, CA, USA. Nicksic NE, Bono RS, Rudy AK, Hoetger C, **Cobb CO**, **Barnes AJ**. Profiling racial/ethnic disparities in youth exposure to tobacco advertising. Poster presented at the annual meeting of the Society for Research on Nicotine and Tobacco; February 20-24, 2019; San Francisco, CA, USA. **Cobb CO**, Rudy AK, Bono R, Hoetger C, **Barnes AJ**. Cannabis use patterns and methods of administration among Virginia adolescent cigarette smokers and nonsmokers. Poster presented at the Institute for Cannabis Research; April 28th, 2018; Pueblo, CO, USA Wall, CSJ, Braxton, D, Cogley, J, **Barnes, AJ**, & **Cobb, CO**. (2017, June) Is online electronic cigarette advertising targeting youth and young adults? Evidence from website location and spending data. Poster presented at: VCU 2017 Massey Cancer Research Retreat; Richmond, VA. **Barnes, A.J.**, Rudy, A.K., Bono, R.S., & **Cobb, C.O.** (2018, February). Youth receptivity to e-cigarettes and tobacco cigarettes after exposure to e-cigarette advertisements. Poster presented at the 24th Annual Meeting of the Society for Research on Nicotine and Tobacco, Baltimore, MD. **Barnes, A.J.**, Rudy, A.K., Bono, R.S., & **Cobb, C.O.** (2017, October). Youth receptivity to e-cigarettes and tobacco cigarettes after exposure to e-cigarette advertisements. Oral presentation at: NIH Tobacco Centers for Regulatory Science Fall Meeting, Bethesda, MD. **Barnes, A.J.**, Rudy, A.K., Bono, R.S., & **Cobb, C.O.** (2018, March). Youth receptivity to e-cigarettes and tobacco cigarettes after exposure to e-cigarette advertisements. Oral presentation at: Virginia Youth Tobacco Projects Conference, Richmond, Va.

		Barnes, A.J., Bono, R.S., Rudy, A.K., & **Cobb, C.O.** (2018, June). Effect of Electronic Cigarette Advertising Themes on Hypothetical Demand among Adolescents. Podium Presentation, Academy Health Annual Research Meeting, Health Economics Interest Group, Seattle, WA. Bono R.S., Rudy A.K., **Cobb C.O.**, **Barnes, A.J.** (2018, February). Effect of electronic cigarette advertising themes on abuse liability among adolescents. Poster presented at the 24th Annual Meeting of the Society for Research on Nicotine and Tobacco, Baltimore, MD. Bono, R.S., Rudy, A.K., **Cobb, C.O.**, **Barnes, A.J.** (2018, March). Effect of electronic cigarette advertising themes on abuse liability among adolescents. Poster presented at the Virginia Conference on Youth Tobacco Use, Richmond, VA. **Cobb, C.O.**, Wall C.S.J., Braxton D., Cogley J., Khan M., Sey S., Bhatt S., Hoetger C., Rudy A.K., & **Barnes, A.J.** (2018, February). TV and online electronic cigarette video advertising: Thematic content and spend characteristics. Poster presented at the 24th Annual Meeting of the Society for Research on Nicotine and Tobacco; Baltimore, MD. Hoetger, C., **Cobb, C.O.**, Wall, C., Braxton, D., Cogley, J., Khan, M., Sey, N., Bhatt, S., Rudy, A. K., & **Barnes, A.** (2018, March). TV and online electronic cigarette video advertising: Thematic content and spend characteristics. Presented at the Virginia Youth Tobacco Products Conference, Richmond, VA. Hoetger C., Rudy A., Bono R., **Barnes, A.**, & **Cobb C.O.** (2017, November). Potential tobacco regulations affect electronic cigarette susceptibility, perceptions of harm and simulated purchases among cigarette smokers and nonsmokers. Poster presented at the 145th American Public Health Association Annual Meeting and Expo, Atlanta, GA. Rudy, A.K., **Cobb, C.O.**, Morlett-Paredes, A., Brosnan, P., Nicksic, N., **Barnes, A.J.** (2018, March). Print and online cigarette advertising content and themes. Poster presented at the Virginia Youth Tobacco Projects Conference, Richmond, VA.

[a]Does not include presentations at the VYTP Research Coalition annual meetings, department grand rounds and similar presentations.

Table 6. Evaluation Summary—Accomplished Specific Aims

PI/University	Project Title	Specific Aims	Accom-plished[a]
FY 2013-15 Studies			
Robert Smith, PhD, and Craig McDonald, PhD, George Mason University	Mechanisms of Adolescent Vulnerability to Neurobehavioral Effects of Nicotine	1. Use immunohistochemistry to evaluate how expression of MAPK, a key element of a second messenger system we hypothesize to be involved, is altered following exposure to nicotine paired with a specific cue. 2. Determine whether a MAPK inhibitor blocks single-trial nicotine CPP in adolescent rats. 3. Determine whether co-administration of a D1 dopaminergic antagonist with nicotine blocks the dendritic growth response in nucleus accumbens induced by nicotine alone. In addition to dendritic outgrowth, we will assess development of nicotine sensitization, a lasting behavioral effect reliably associated with adolescent nicotine.	Yes Yes Yes
Karl Fryxell, Ph.D., George Mason University	What social and molecular factors drive nicotine preference in adolescent mice?	1. We will bridge the gap between human and animal nicotine research by analyzing the impact of social isolation stress on nicotine preference in adolescent C57BL/6J mice. 2. We will measure nicotine consumption and stress reactivity in isolated and group-housed adolescent C57BL/6J CD81 -/- mice. 3. We will measure both D2 dopamine receptor mRNA and protein levels in the same population of adolescent mice following a single nicotine injection.	Yes Yes Yes
Darlene H. Brunzell, PhD, Virginia Commonwealth University	Exercise and environmental enrichment to prevent nicotine addiction in adolescent males and females	1. Does aerobic exercise alter vulnerability to nicotine during adolescence? In these experiments we will compare rates of acquisition of adolescent-onset nicotine self-administration between male and female rats with 2 hr access to a running wheel (exercise) and control subjects that have a 2 hr access to a locked wheel in their home cages (sedentary). We will further use a progressive ratio schedule of reinforcement (PR) to determine if exercise curbs motivation to self-administer nicotine in those rats that do acquire. 2. Does environmental enrichment alter vulnerability to nicotine during adolescence? In these experiments we will compare rates of acquisition of adolescent-onset nicotine self-administration between male and female rats housed in one of 4 housing conditions (impoverished, enriched, enriched plus exercise, enriched plus locked wheel). 3. To identify protective effects of neurotrophins and inflammatory cytokines against nicotine addiction phenotype. In vitro studies using primary tissue culture will further assess the effects of nicotine in combination with candidate neurotrophins and cytokines on downstream signaling pathways and identify if nicotine-associated changes in signaling	Yes Partial No[b]

PI/University	Project Title	Specific Aims	Accom-plished[a]
		take place in neurons or glia.	
Michael Mason, Ph.D. Virginia Commonwealth University	Reducing Teen Tobacco Use Via Text Messaging: Motivational Interviewing Integrated with Social Network Counseling	1. Apply and test an evidence-based Motivational Interviewing with Social Network counseling intervention (MIʃSN) into a personalized text-messaging platform targeting smoking adolescents. 2. Examine the mediating effect of social network quality on the treatment group's tobacco use. 3. Characterize the geographic nature (density/distance) of tobacco selling outlets in relation to participating adolescents' routine locations (activity space) and examine this relationship over time.	Yes Yes Yes
Rosalie Corona, PhD, Virginia Commonwealth University	Can Parents Help Prevent Youth Tobacco Use? An Evaluation of Two Evidence-based Parenting Programs	1. Determine whether the combination of two evidence-based parenting programs for parents of adolescents can reduce tobacco use, intentions to use tobacco, and associated risk behaviors (e.g., alcohol use, problem behaviors) within a population of high risk adolescents. 2. Assess the program's effects on parenting behaviors, the parent-child relationship, and parent-adolescent communication, as perceived by parents and adolescents. 3. Determine whether theoretically important components of our behavior change model predict changes in behaviors targeted by the intervention. 4. Explore subgroup differences in the effectiveness of the program for different types of parents and adolescents (e.g., parental smokers, gender of adolescents). 5. Identify the messages about tobacco use that parents communicate to their adolescents.	Yes Yes No No No[b]
FY 2016-18 Studies			
Kelli Will, PhD, Eastern Virginia Medical School	Examining E-Cigarette Use: Developing Effective Risk Communication Methods to Reach Virginia Youth	1. Identify mediating knowledge, attitudes, beliefs, and behavioral factors related to teen use of and acceptance of e-cigarettes, including the relationship between smoking traditional cigarettes and e-cigarettes 2. Work with local teens to develop effective risk communication messages and dissemination pathways to reach teens via social media 3. Establish effectiveness of campaign messages and dissemination pathways on knowledge, attitudes, beliefs, and behaviors	Yes Yes Yes
Michael Scott, PhD, University of Virginia	Characterization of Nicotine Vapor Intake in Adolescent Mice	1. In adult and adolescent male and female mice, we will determine whether nicotine at 5, 10 and 25mg/ml (all concentrations found in commercially available e-liquid) can support fixed-ratio vapor self-administration.	Yes

PI/University	Project Title	Specific Aims	Accom-plished[a]
		2. We will examine vapor intake during an extended access, intermittent exposure paradigm, composed of a 23 hour long operant responding session followed by a 24 hour break in between trials. To investigate whether dependence can be observed following chronic intermittent vapor exposure, we will test whether adolescent and adult mice demonstrate somatic and affective signs of withdrawal. 3. We will address the question of whether exposure to vapor in adolescence, similar to exposure to tobacco smoke or nicotine delivered intravenously, can potentiate the rewarding value of nicotine when animals again encounter the drug in adulthood.	No[c] No[c]
Rosalie Corona, PhD and Joshua Langberg, PhD, Virginia Commonwealth University	Integrating Tobacco Prevention Strategies into Behavioral Parent Training for Adolescents with ADHD	1. Integrate evidence-based tobacco use prevention skills into an evidence-based parent-teen behavioral treatment program for ADHD (STAND-G). 2. Examine the impact of STAND-G+SFP on factors that are associated with reduced adolescent tobacco use: (a) adolescent skills; (b) parenting skills; and the (b) family relationship. 3. Assess whether the STAND-G+SFP intervention has an impact on adolescent tobacco and other substance use. 4. Explore whether theoretically important components of our behavior change model mediate the intervention's impact on tobacco and other substance use.	Yes Yes Yes No
Andrew Barnes, PhD and Caroline Cobb, PhD, Virginia Commonwealth University	Categorization and Effects of E-Cigarette Ads on Attitudes, Intentions and Abuse Liability in Youth	1. Perform a comprehensive content analysis of EC advertising messaging themes. 2. Assess the effects of EC messaging (e.g. theme 1 vs. control, theme 1 vs. theme 2) on EC attitudes, intentions, and abuse liability. 3. Compare the effects of messaging theme on EC attitudes, intentions, and abuse liability measures between smokers and susceptible non-smokers.	Yes No[b] No[b]

[a]The determination of whether or not a specific aim was accomplished was based on a review of the study final report. It should be noted that in several instances in which a specific aim was determined to be not accomplished, the final report indicated that the analyses needed to address the specific aim would be conducted in the future.

[b]Although these aims were not completed within the timeframe of the project final report, they were completed later and presented at national conferences and will be reported in publications currently in preparation.

[c]This aim was not accomplished or attempted, as the study did not achieve adequate demonstration of a dose response in Aim 1.

Other Comments by PI's

"The VFHY grant has generated synergy for tobacco research and outreach in our division, where multiple investigators and trainees are now focused on tobacco prevention and partnering on multiple projects, publications, and presentations. Our VFHY grant led to an understanding of teen needs regarding risk communication and the creation of an online campaign, Rethink Vape, along with its companion website and social media platforms. The ads

were not only run here locally in Hampton Roads, but have ran in multiple other areas in North Carolina and Virginia with health department funding, as well as a statewide Virginia campaign paid for by VFHY. In addition to continuing our research, we are working heavily across campus and the community to inform [people] about e-cigarette harms, create needed resources, and provide educational trainings to physicians, nurses, parents, teachers, and teens. We continue to follow the community engaged research approach we began in the VFHY grant, working closely with the Consortium for Infant and Child Health's Respiratory Health Workgroup to identify and respond to community needs regarding teen e-cigarette use prevention."

VFHY Funded Research Grant Summaries

1) Virginia Commonwealth University Grant Award Amount: $449,929
Culturally Enhancing a Motivational Interviewing Intervention for Latinx Adolescents
Principal Investigator: Rosalie Corona, PhD, Professor and Director of Clinical Training, Department of Psychology **Collaborating Partners:** College of William & Mary, Virginia Tech

- During Year One, the research team began implementation of a MI intervention (Group Motivational Interviewing for Teens, GMIT) with Latinx adolescents. GMIT, like many other evidence-based substance use prevention programs, does not address the risks of alternative tobacco products (ATPs). Therefore, they are integrating the VFHY module, *The Dangers of Other Tobacco Products,* into GMIT to create a more comprehensive tobacco-use prevention program (GMIT-ATP).

- The team linguistically translated the interventions and made the interventions more culturally relevant to Latinx families (e.g., changing pictures). This adaptation will result in a linguistically and culturally relevant intervention focused on tobacco use that includes information about ATPs.

2) Virginia Commonwealth University $149,130 (one-year grant)
Profiling Youth Cigar Use in Low SES Communities: A Mixed Methods Approach
Principal Investigator: Andrew J. Barnes, PhD, Associate Professor, Health Behavior & Policy
Collaborating Partners: Research Unlimited, LLC

- In the study, participants aged 13-17 years who are current cigar users (N=100) and non-users (N=100) completed a single in-person session to collect biomarker and health measures, assess other quantitative data outcomes via a survey, and indicated whether they would like to be re-contacted for future focus groups. Focus groups of cigar users and non-users (N~4; 6-10 individuals per group) were used to elucidate and expand upon results and provide greater context and meaning of health/biological measures, tobacco-related attitudes, perceptions, knowledge, and behavior, and tobacco-related environmental factors.

- The specific aims of the study were to: 1) characterize and compare quantitatively tobacco-related health, attitudinal, behavioral, and environmental profiles of cigar smoking and non-user youth living in low SES communities near Richmond, VA, 2) qualitatively assess differences in the above domains between cigar smokers and non-users that are amenable to tobacco prevention and control efforts, and 3) engage a community advisory board to translate and disseminate findings from Aims 1 and 2 to community members and local/state policymakers via a policy brief in order to inform local, state, and federal efforts to reduce the harms of cigar use among youth.

3) Virginia Commonwealth University $450,000
Geospatial Analysis of Tobacco/Vape Retail Outlets & Youth Tobacco Use to Inform VA Policies

Principal Investigator: Elizabeth Do, PhD, MPH Instructor, Department of Health Behavior & Policy, School of Medicine **Collaborating Partners:** Research Unlimited, LLC, Virginia Department of Behavioral Health and Developmental Services

- This study aims to 1) characterize the existing tobacco landscape within Virginia using geospatial analyses, 2) determine how local and federal regulations might affect tobacco retail outlet (TRO) density, and 3) evaluate the association that TRO density has with risk for cigarette, e-cigarettes, and dual use among youth.

- Under Aim 1, the research team used 12 measures of social disadvantage to estimate a neighborhood disadvantage index (NDI) and to explain variation in TRO and VSO rates across census tracts in Virginia. Results demonstrate that the estimated NDI is significantly associated with increased risk of TRO and VSO density and that variables making up this index do not equally explain the association between NDI and TRO and VSO density. Under Aim 2, the research team plans to repeat these analyses

- 147 youth participants and their parents/guardians (of the target N = 480) have enrolled in the Adolescents, Place, and Behavior Study and completed baseline assessments under Aim 3, which seeks to determine how TRO and VSO density influences risk for initiation of cigarette, e-cigarette, and dual use among youth by linking data from this study to TRO and VSO density data in Aim 1.

4) Virginia Commonwealth University $449,356
Preventing Tobacco Use Among Youth Exposed to Adverse Childhood Experiences
Principal Investigator: Sunny Shin, PhD, Associate Professor, School of Social Work and School of Medicine Department of Psychiatry **Collaborating Partners:** Virginia Department of Social Services, Virginia Homes for Boys and Girls

- During Year One, the research team created a collaborative called United in Building Evidence Together (U-BET), which consists of the research team, community partners, and potential service recipients. The U-BET Collaborative is developing a trauma-focused, prevention program designed to promote individual self-regulation processes and to prevent youth tobacco and other drugs (TOD) use. Using qualitative content analysis, 20 evidence-based youth TOD prevention and trauma treatment programs were reviewed. Through the systematic classification process of coding and identifying themes or patterns, the project team identified five core contents to be conveyed to ACEs-exposed youth including emotion, self-regulation, prosocial behavior, TOD resistant skills, and trauma response.

5) Virginia Commonwealth University $450,000
Systems Modeling and Simulations for Effective Tobacco Control and Prevention Policies Among Youth
Principal Investigator: Hong Xue, PhD, Assistant Professor, Health Behavior and Policy

Collaborating Partners: The College of William & Mary, Georgetown University, Georgia State University, Tobacco Free Alliance of Virginia, University of Virginia

- In Year One, the goal was to assess the effects of increasing the minimum age of legal access to tobacco products. Some highlights include: The research team has formed a working group to conduct a systematic review of all the existing studies since the early 1990s regarding the effects of increasing the minimum age of legal access to tobacco products on tobacco use. The study found that the impact of increasing minimum age of legal access to tobacco products remains unclear; simulation modeling is needed and powerful to predict potential intended and unintended consequences to inform policies. A manuscript is under revision and will be submitted for publication early in July 2019. The modeling working group of the team has developed a system dynamics model to simulate the effects of increasing minimum age of legal access. They have begun model parameterization, calibration, validation and evaluation. Preliminary model predictions suggests that, on average, 24 billion US dollars can be saved each year in a 10-year period after raising MAL from 18 to 21. A manuscript is in progress and expected to be submitted for publication early in August 2019.

6) Virginia Commonwealth University $450,000
The Virginia Youth Tobacco Projects Research Coalition Core

Principal Investigator: J. Randy Koch, PhD, Center for the Study of Tobacco Products
Collaborating Partners: The College of William & Mary, Eastern Virginia Medical School, George Mason University, James Madison University, Old Dominion University, Virginia Tech, University of Virginia, Virginia State University

- The annual meeting of the VYTP membership was held on February 14 and 15, 2019. The meeting presentations were arranged into panels with similar topics, and featured both final report presentations on the VFHY-funded large research grants and VYTP small grants from the FY 2015-18 grant period, as well as presentations on the newly funded large and small grants for FY 2019-21. The panels were as follows: *Tobacco Control Policy Research*, *Understanding Youth Tobacco Use: Implications for Prevention,* and *Interventions to Prevent or Reduce Adolescent Tobacco Use*. VYTP members moderated the sessions. The meeting was attended by 73 individuals, including VYTP members, VFHY staff, students, and others).

- The VYTP Research Coalition continues to grow, now including a total of 62 investigators from eight universities, as well as three members from community-based prevention programs. This represents a net increase of nine members over FY 2018. The increase in membership appears to be the result of the larger number of large and small grants for the current project period. Further, we did not appear to experience any loss of membership due to the discontinuation of funding for basic science and animal studies through VFHY's "large grant" mechanism. While seven investigators resigned their membership in the VYTP, these were due to retirements (2), moving to a new university

(3), and a change in research interests (2). The VYTP Research Coalition remains a vibrant organization with the vast majority of members actively participating in VYTP events; and many members continue to support their students' participation in VYTP activities.

7) Eastern Virginia Medical School $450,000

A Social Ecological Approach to Alternative Tobacco Education

Principal Investigator: Kelli England Will, PhD, Professor of Pediatrics, Division of Community Health and Research **Collaborating Partners:** Consortium for Infant and Child Health (CINCH), YMCA of South Hampton Roads

- During the first year of the grant, several activities were undertaken to inform the strategy for intervention. The research team conducted focus groups, surveys, and input sessions with teachers, medical professionals, parents, and teens from Hampton Roads, Virginia, to examine each group's perspectives regarding opportunities and challenges for vape education in specific settings. Six input sessions were held with 239 teachers and health professionals, and 6 focus groups were held with 16 parents, 4 teachers, and 6 nurses. These groups took place at various YMCAs of South Hampton Roads locations, on EVMS campus, CHKD hospital, and local school buildings. Input sessions and stakeholder engagement also provided opportunities to present ENDS trainings to health professionals and community members. Surveys were also conducted with 102 medical professionals to garner additional perspectives. Other data collection activities for phase 1 include launching an online teen survey, holding teen focus groups, and conducting key informant interviews. These methodologies have been finalized and approved by IRB and are ongoing this summer.

- Thus far, Phase 1 findings indicate that regardless of audience, there is limited knowledge regarding ENDS and alternative tobacco risks. Most participants (parents, teachers, nurses, doctors) are unaware of the potential risks and public health recommendations. Collectively, our participants are uncertain how to talk about ENDS products with youth and their families and are eager for tools and knowledge. Resources and materials are needed that are specific to each setting/purpose.