

# **Cancer Scholars Program (CSP): Exploring Research Across the Cancer Continuum**

Melinda Butsch Kovacic, MPH, PhD

*In partnership with Sharon Sauter in the UCCC and Rachel Nolan in COM EH  
and many others...*

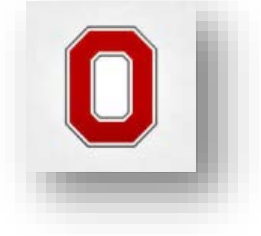
# Formal Training

## Doctoral Dissertation Research

The Ohio State University Biochemistry Program

*Thesis: Control of Retroviral Translation & Relationship to Genomic RNA Packaging*

Defined viral RNA trafficking in HIV-1infected T-cells ; characterized post-transcriptional control of gene expression of a simple oncogenic retrovirus, spleen necrosis virus.



## Post-doctoral Research

National Cancer Institute Cancer Prevention Fellowship  
Hormonal Epidemiology Branch, Division of Cancer Epidemiology and Genetics

Goal: to identify molecular and immunologic factors associated with the development of cancer.

Examined the influence of markers of the innate immune response with Epstein Barr virus-associated nasopharyngeal; elucidated the interaction of carcinogenic Human Papillomavirus (HPV) types with exogenous exposures (both environmental & lifestyle) and host factors in the etiology of cervical cancer.



# Professional Positions

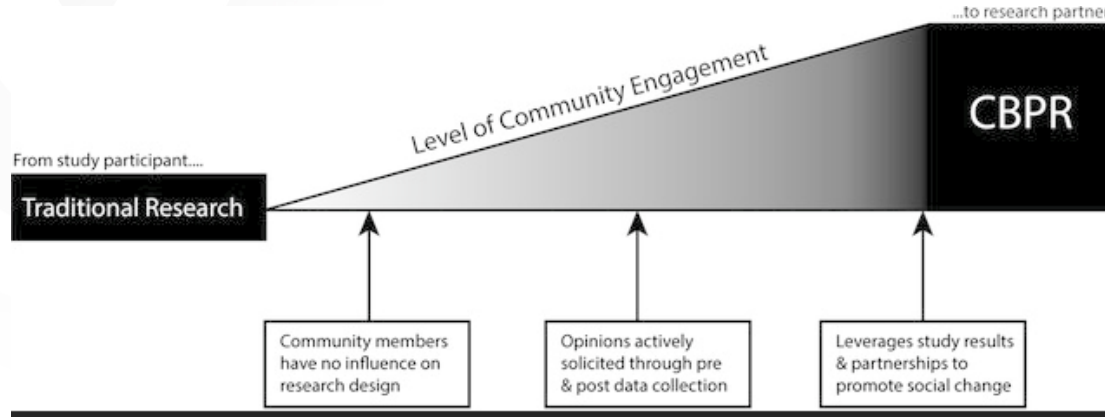
- **Cincinnati Children's Hospital Medical Center Research**
  - Division of Asthma Research
  - Molecular/Genetic/Epigenetic Clinical Asthma Research
  - Cancer/Fanconi Anemia Epidemiological Research
  - Community Engaged Research/Citizen Science



- **University of Cincinnati College of Allied Health Sciences**
  - Associate Dean of Research
  - Faculty mentorship & Research infrastructure development
  - Representation on UC committees
  - UC Office of Research Faculty Fellow



# Community Based Participatory Research (CBPR)





**WE**  
engage  
4 health

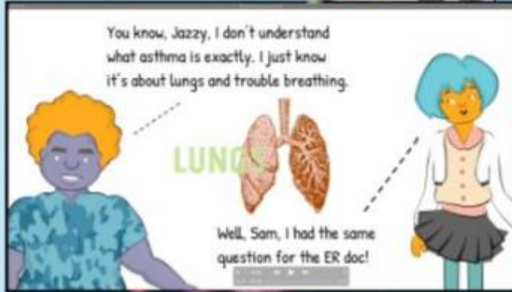
*community-led learning  
and research for health*



*We Engage for Health is an academic-community partnership focused initially on residents of all ages living in Cincinnati's West End. Our goal is to engage community members in solving their own health challenges. The project features community co-designed stories and learning experiences focused on health science, research, and citizen science.*

# Health Promotion Story Videos

Health stories featuring community cast of characters are being developed for reading in comic book style and watching/listening in video format.



Scan to view the 5-minute video "Breathe Easy."

*& provide your feedback*

# Coronavirus Learning Companion



- Shares the WHY and the science behind COVID-19 restrictions
- Includes 2 hands-on science activity stories too

<https://weengage4health.life/coronavirus-covid19-learning-companion/>



# CANCER QUESTIONS

WE ENGAGE 4 HEALTH IS FUNDED BY A GRANT FROM THE NATIONAL  
INSTITUTES OF HEALTH SCIENCE EDUCATION PARTNERSHIP AWARDS.





DNA

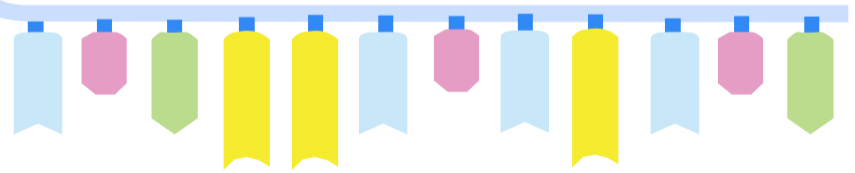


**TURN ON**

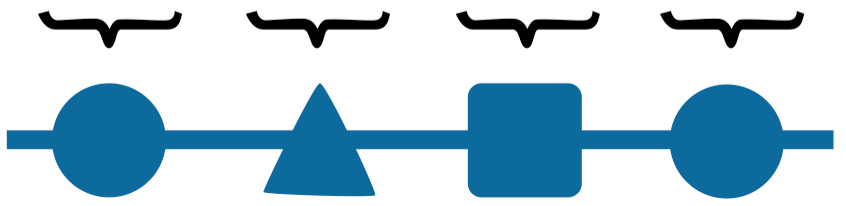
So, genes are instruction sets for making all the different kinds of proteins our bodies need to live and grow.

Each gene makes a certain protein. A gene gets "turned on" to make a protein our cells need at the moment. A gene gets "turned off" to stop making that protein.

GENE



PROTEIN

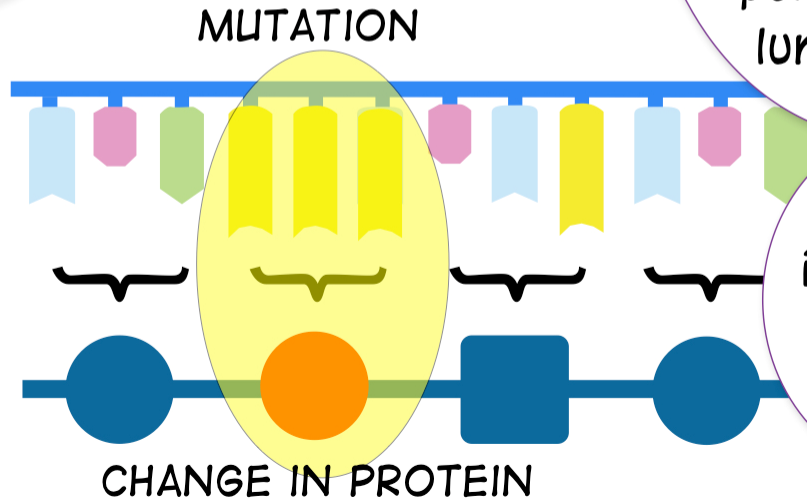


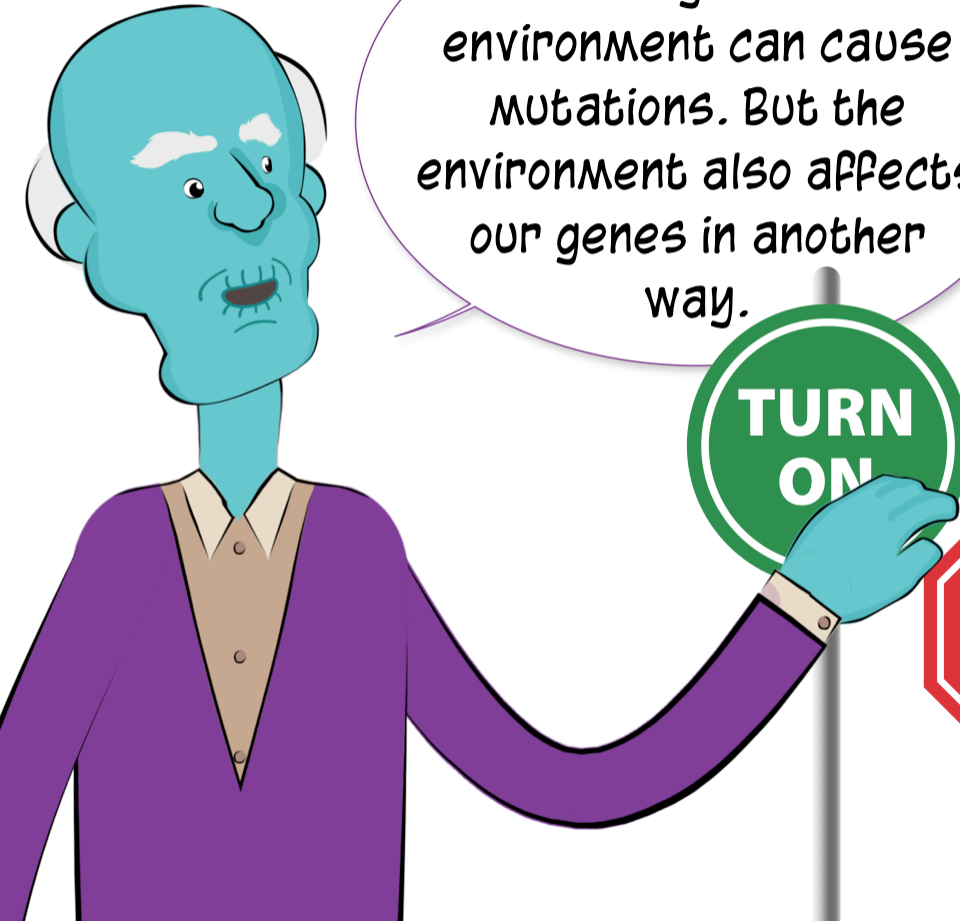
And where does the environment come in?

Some things in the environment directly change genes. A changed gene makes a different protein than it did before. That can cause cancer.

For example, cigarette smoke can change certain genes that make it more likely for a person to get lung cancer.

A change in a gene is called a mutation.





So things in the environment can cause mutations. But the environment also affects our genes in another way.

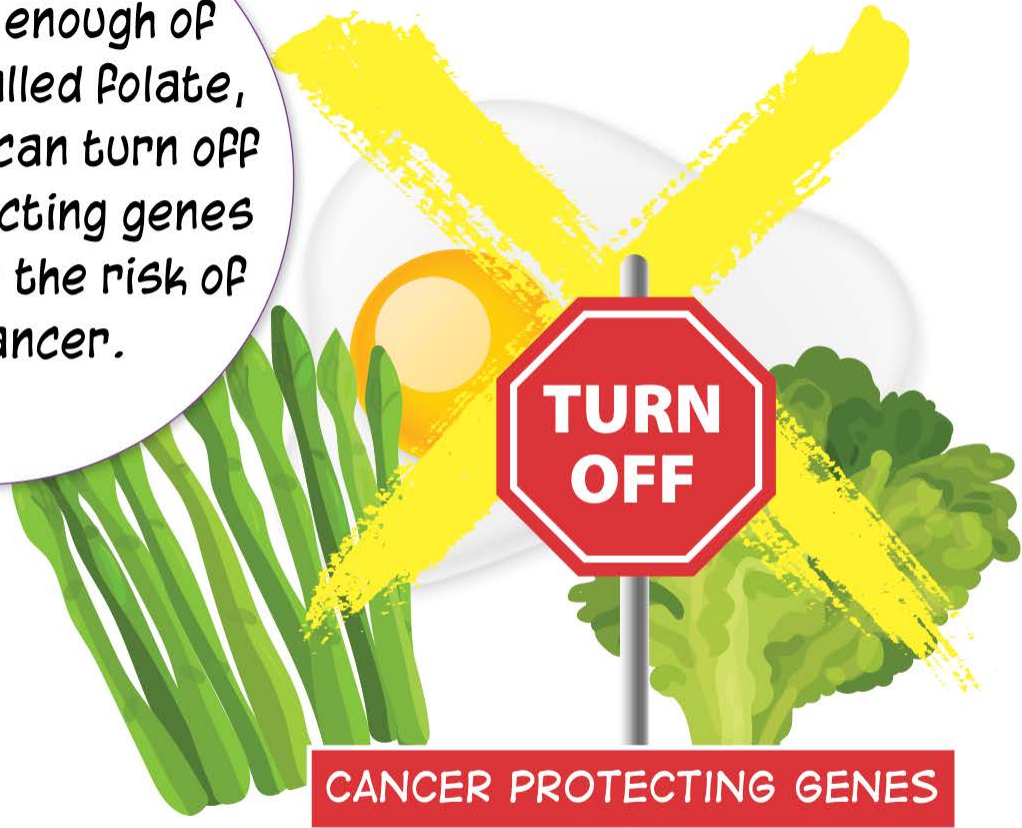
Oh?

Yup! I said before that genes turn on and off all the time – like a switch! Well, many things in the environment cause genes to "turn on" and "turn off."

It might seem strange, but the food you eat is considered part of your environment!



Not getting enough of a nutrient called folate, for example, can turn off cancer protecting genes and increase the risk of colon cancer.



CANCER PROTECTING GENES

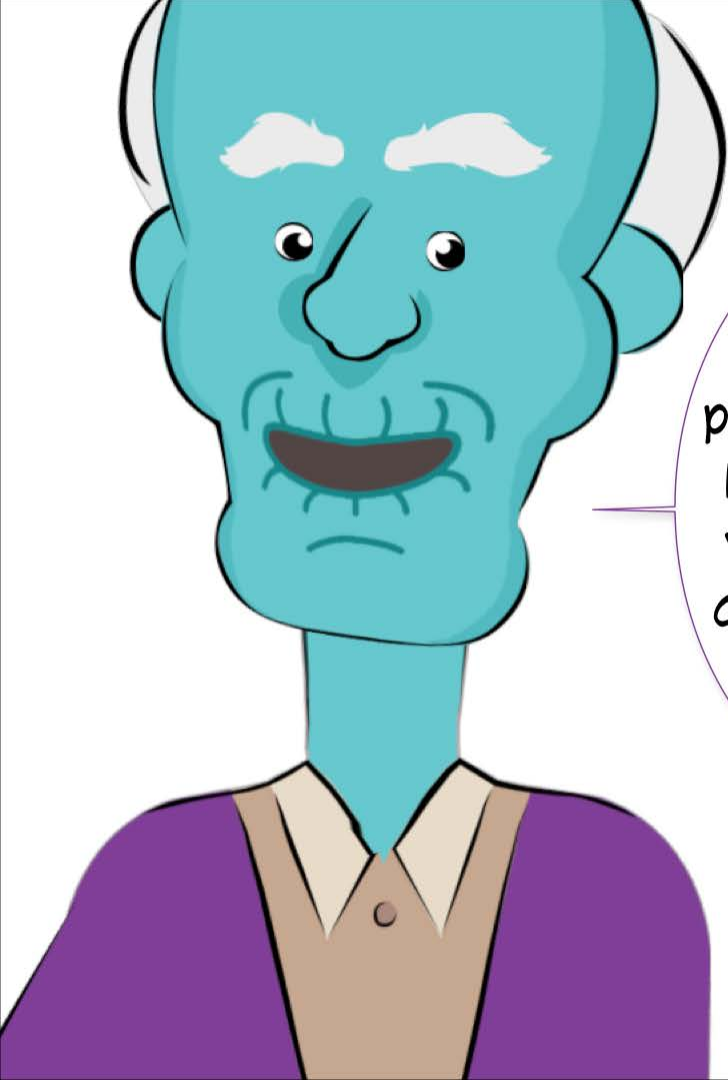
NOT EATING ENOUGH FOLATE-RICH FOODS





# CANCER CONCLUSIONS

WE ENGAGE 4 HEALTH IS FUNDED BY A GRANT FROM THE NATIONAL  
INSTITUTES OF HEALTH SCIENCE EDUCATION PARTNERSHIP AWARDS.



We could tell people that **RISK** is like your chance of winning— or in this case, not winning — a prize.

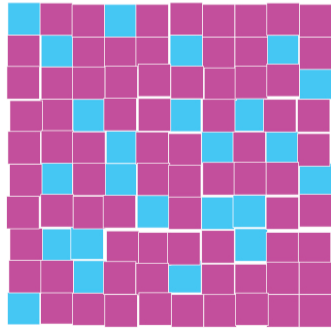


I like comparing lung cancer risk to the chance of getting losing tickets out of different bags!



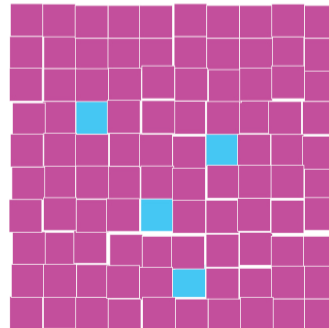
## LUNG CANCER RISK

*SMOKE 5+*



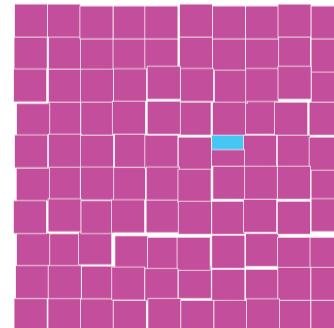
*24 PER 100*

*QUIT SMOKING*



*4 PER 100*

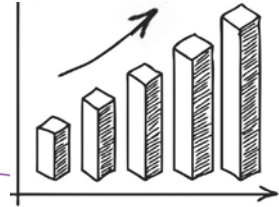
*NEVER SMOKED*



*.5 PER 100*

So what do we report back to the community, and how do we report it?

I think we need to have a community meeting where we share the rate of cancer cases and deaths plus smoking rates.



I think a bar graph would make a bigger impact than this chart because higher numbers would have a taller bar.

People don't need to read every number to see the pattern.

Health Outcomes	
Cancer cases, Overall (rate per 100,000 people)*	250
Cancer cases, Lung (rate per 100,000 people)*	150
Cancer mortality, Overall (rate per 100,000 people)*	100
Cancer mortality, Breast (rate per 100,000 people)*	50
Cancer mortality, Lung (rate per 100,000 people)*	100
Cancer mortality, Colon & Rectum (rate per 100,000 people)*	50
Health Behaviors	
Adult Obesity (%)##	25
Adult Smoking (%)##	25



# Research Education Program (R25)

- **Participants in R25 programs generally may include:**
  - medical
  - dental
  - nursing
  - allied health professional students
  - graduate and undergraduate students



# Research Education Program (R25)

The purpose is to support research education activities that:

- (a) Complement and/or enhance the training of a workforce to meet the nation's biomedical, behavioral and clinical research needs;
- (b) Enhance the diversity of the biomedical, behavioral and clinical research workforce;
- (c) Help recruit individuals with specific specialty or disciplinary backgrounds to research careers in biomedical, behavioral and clinical sciences; or
- (d) Foster a better understanding of biomedical, behavioral and clinical research and its implications.

# National Cancer Institute (NCI) Comprehensive Cancer Centers (CCC)

- The NCI CCC are recognized for their scientific leadership, resources, and their research in basic, clinical, and/or population science.
- They demonstrate an added depth and breadth of research, as well as substantial transdisciplinary research that bridges these scientific areas.
- If this NCI R25 is awarded, our efforts will support the claim that UC and its affiliates deserve to receive the NCI CCC designation.

# Faculty Infrastructure

The goal of the CSP team is not only to give students great research experiences, but also:

- To create an infrastructure to support our cancer faculty members' personal research programs.
- 
- To recruit existing faculty into cancer research through collaborative efforts
- To grow our expertise in population-based and community-engaged research.

# Cancer is the US

- Cancer is among the leading causes of death in the U.S.
- Cancer mortality continues to be highest in African American men (239.9 per 100,000)
- Lack of access to advances in cancer prevention, early screening, treatment, and survivorship care in low socioeconomic communities are cited as substantial barriers to improving cancer survivorship.

# Public health experts say...

- That the social environment in which people live, learn, work, and play contributes to disparities and is among the most important determinants of health throughout the life.
- A focused effort is clearly needed to mitigate the observed disparities across the cancer continuum.



## Etiology

- Environmental factors
- Genetic factors
- Gene-environment interactions
- Medication (or pharmaceutical) exposure
- Infectious agents



## Prevention

- Tobacco control
- Diet
- Physical activity
- Sun protection
- HPV vaccine
- Limited alcohol use
- Chemoprevention



## Detection

- Pap/HPV testing
- Mammography
- Fecal occult blood test
- Colonoscopy
- Lung cancer screening



## Diagnosis

- Shared and informed decision making



## Treatment

- Curative treatment
- Non-curative treatment
- Adherence
- Symptom management



## Survivorship

- Coping
- Health promotion for survivors



# Workforce Shortage

- According to the IOM, the near future will bring a shortage of workers in the medicine, nursing, biomedical and laboratory sciences, and environmental health fields threatening our most vulnerable populations

# Silos

- There should be a systems-over-silos approach (i.e., an approach that crosses health care professions and covers the entire spectrum of cancer care) to addressing the shortage
- Also a critical need for better teamwork and collaboration with and between cancer disciplines.

# Who Can Participate?

- CSP will invite undergraduates from all races and backgrounds
- At least 35% first generation and/or underrepresented minority
- Supported by the UCCC and a Cancer Mentor Network (CMN) of 40+ faculty from cancer and related fields
  - Will serve as a Learning Community all year long

# 1. Offer Cancer Research Experiences to Undergraduate Scholars

- Facilitate high quality research experiences via 10-week full-time, paid, summer internships.
- Focused on topics across the cancer continuum
- Select high achieving interns will be offered optional semester-long, part-time, paid experiences or a 2<sup>nd</sup> summer internship
- Up to 2 scholars/faculty, mentors may be provided \$1000/mentee to defray costs of the interns' research. The program will pay the scholars directly.

## 2. Cultivate Deeper Understanding of Cancer Research & Cancer Careers

- Weekly, engaging, introductory lessons focused on cancer biology and cancer research along the continuum.
- Weekly discussions around career mentoring, planning and support will prepare Scholars to apply for and succeed in a post-baccalaureate education programs and in the cancer workforce.



## 2. Cultivate Deeper Understanding of Cancer Research & Cancer Careers

- Interns will also choose, prepare for, and collectively lead one of 6 research-focused, community outreach experiences:
  - a cancer screening event,
  - cancer prevention/survivor nutrition classes,
  - empowerment drumming session,
  - grief counseling session,
  - patient navigator experience &
  - community-based citizen science event.

### 3. Develop Cultural Competence & Team Science Skills

- Develop students' understanding of cultural competence and teamwork by providing twice weekly, interactive and engaging lessons on
  - cancer health disparities;
  - cultural competency,
  - team science, and
  - communicating science within science and to the public.
- All CMN faculty will be invited to attend lessons and participate in CSP activities during the summer. Other CMN activities and development opportunities will be offered during the academic year

## 4. Systematically Evaluate Our Scholars' Successes

- Scholars' success will be evaluated through:
  - Scholars' written research reports,
  - oral presentations,
  - mentor evaluations,
  - lessons' pre/post surveys and
  - self-efficacy and skills assessments.
- Scholars will also be tracked overtime to ascertain admittance and retention in cancer-related graduate programs and cancer-focused research careers.

Questions? Ideas?