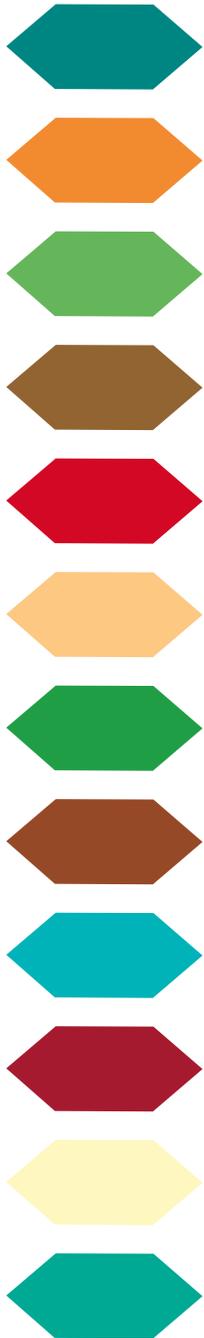




This presentation is intended for the scientific exchange of information and is not for advertising or promotional purposes and is not intended for a consumer audience. JUUL products are not intended for the diagnosis, cure, mitigation, treatment, and/or prevention of a disease or condition, including nicotine addiction or dependence.



Erik Augustson, PhD, MPH  
Senior Director Behavioral Research & Interventions

*JUUL: The satisfying alternative for smokers*



# OUR MISSION

To improve the lives of the world's one billion adult smokers by **eliminating combustible cigarettes**



## OUR MISSION

JUUL Labs' co-founders **James Monsees** and **Adam Bowen**, began developing alternative technology to combustible cigarettes at Stanford University.

Being smokers for many years, they knew a successful smoking alternative had to offer **comparable nicotine satisfaction**. Their collaboration led to the development of a **groundbreaking technology** that delivered on that promise and continues to revolutionize the lives of smokers.



**JUUL** LABS

# SMOKERS ARE SEARCHING FOR ALTERNATIVES THEY DESERVE BETTER

~70%

of adult smokers report  
they want to quit completely<sup>1</sup>

30+

the average smoker will  
attempt to quit 30+ times  
before successfully quitting  
for at least one year<sup>2</sup>

<5%

of quit attempts  
are successful<sup>3</sup>

1. CDC: Quitting Smoking.  
[www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/cessation/quitting/](http://www.cdc.gov/tobacco/data_statistics/fact_sheets/cessation/quitting/)

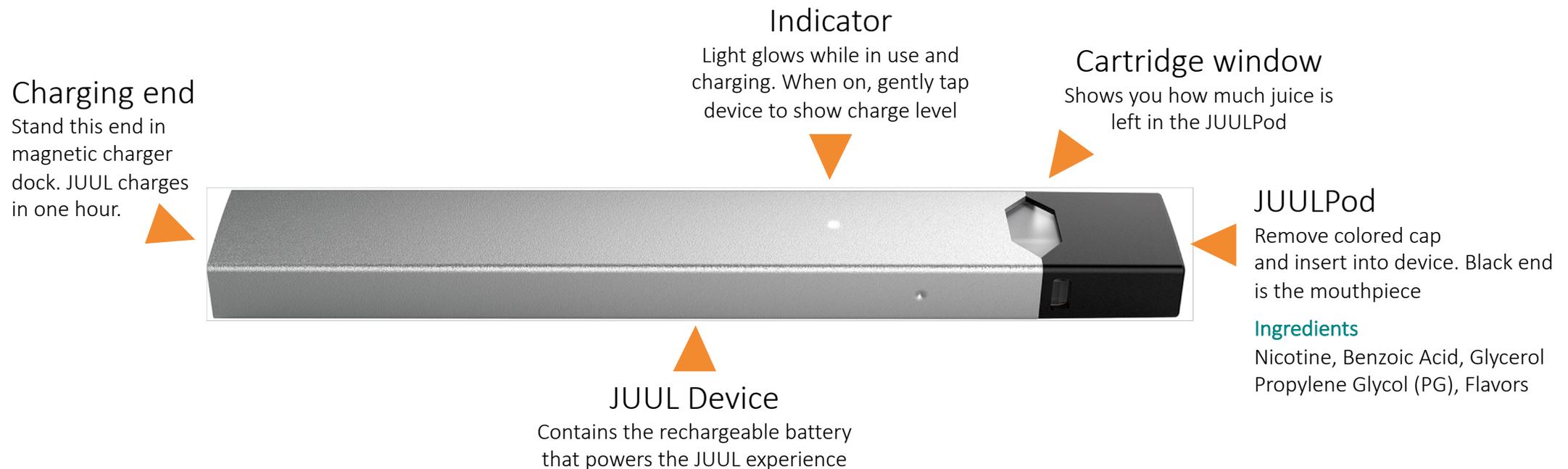
2. Chaiton M, et al. (2016). Estimating the number of quit attempts it takes to quit smoking successfully in a longitudinal cohort of smokers. *BMJ Open* 6: e011045. doi: 10.1136/bmjopen-2016-011045.

3. Hughes JR, (2004). Shape of the relapse curve and long-term abstinence among untreated smokers. *Addiction* 99: 29–38

# JUUL IS PROVIDING SMOKERS WITH A TRUE ALTERNATIVE



Compared with other alternative nicotine delivery products, the JUUL system is simple and convenient for adult smokers to use and was designed to help the switching transition.



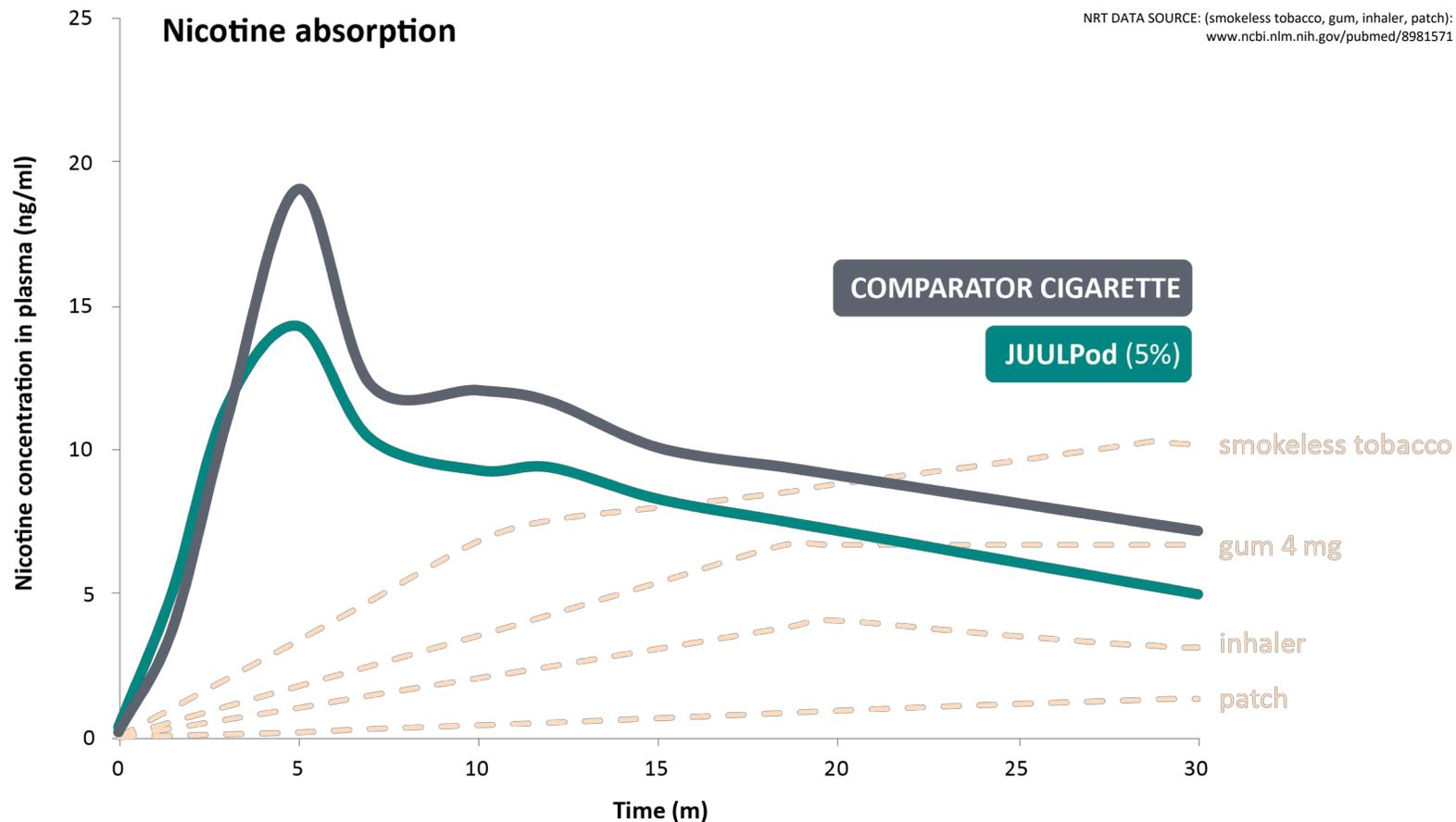


# JUUL IS PROVIDING SMOKERS WITH A TRUE ALTERNATIVE



JUUL's technological design **closely replicates the satisfaction of a cigarette** by mimicking peak nicotine delivery

**Other nicotine delivery products, including smokeless tobacco, NRTs, gums, lozenges, and patches require more time to reach peak nicotine absorption and have lower peaks, compared with conventional cigarettes**



# RESEARCHING THE PUBLIC HEALTH IMPACT OF JUUL PRODUCTS

## PRECLINICAL AND TOXICOLOGY STUDIES

Ingredient and analyte testing of JUUL e-liquids and product aerosols for a variety of substances; testing the impact of JUUL products on cytotoxicity (cell death) and genotoxicity (cell mutation)

## CLINICAL STUDIES

Testing the impact of our products on people—how people use the product, how much/how often they use it, how biomarkers of exposure and potential harm change over time vs cigarettes, the environmental impact to others, and the potential physiological impact to the individual



## BEHAVIORAL STUDIES

Examines what smokers do in the real world when exposed to JUUL products; what are their switch and recidivism rates; who are the smokers that are most successfully able to switch; and what drives switching?

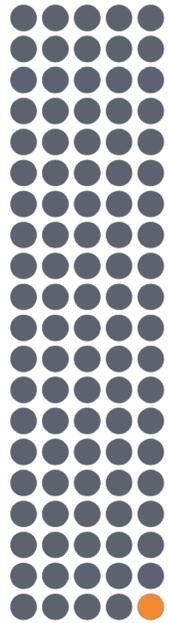


PRECLINICAL AND CLINICAL STUDIES

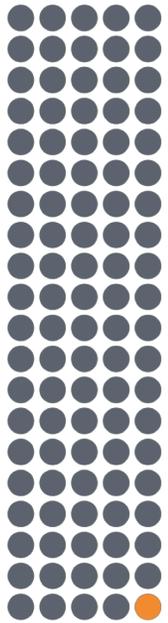
# PRECLINICAL AND CLINICAL STUDIES

## VAPOR EXPOSURE (JUULPOD)

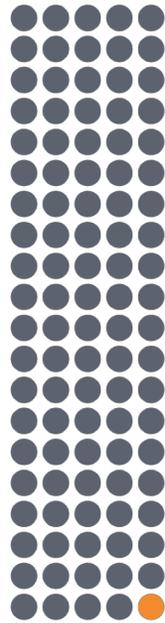
vs. CIGARETTE SMOKE



CARCINOGENS



RESPIRATORY  
TOXICANTS



CARDIOVASCULAR  
TOXICANTS



A study comparing cigarette smoke to JUUL vapor found that cigarette smoke was cytotoxic (caused cell death), but **JUUL aerosol was not cytotoxic**

**JUUL aerosol is significantly lower in key HPHC's** (harmful or potentially harmful constituents) compared with cigarette smoke

**>99% reduction**

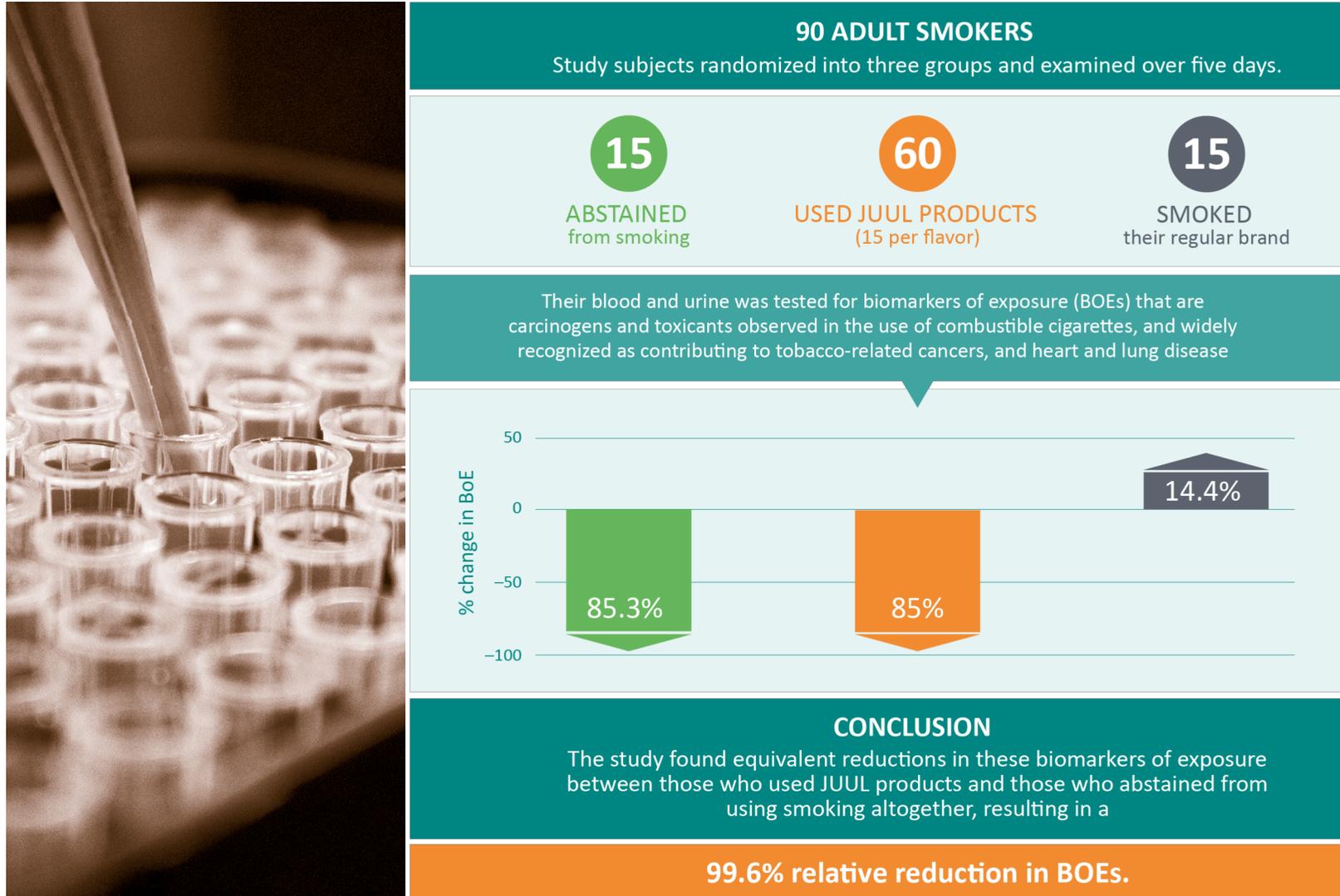
in exposure to levels of harmful chemicals detected in cigarette smoke

Note: Among all HPHCs (harmful and potentially harmful constituents) that were detected in the reference cigarette smoke, the average aerosol of all 8 JUULpod flavors contained at least 99% fewer carcinogens, respiratory toxicants, and cardiovascular toxicants than the amount found in the reference cigarette smoke. Chromium and nickel content were below quantifiable levels in JUUL aerosol and not detected in reference cigarette smoke. Experiment conducted using single use smoking machine; human usage may differ from smoking machine; chart represents relative mass of chemical generated per smoking machine. Reference cigarette and JUUL aerosol were tested with different puff profiles. Percentage reduction of group of chemicals is by weight; % reduction in chemicals may not linearly relate to reduction of disease. 99% reduction figures refer to mean % reduction of category; some individual components of category may be less than 99% reduction

1. HPHC Analysis of Eight Flavors of a Temperature-Regulated Nicotine Salt-Based ENDS Product<sup>™</sup> as presented at GFN 2018.

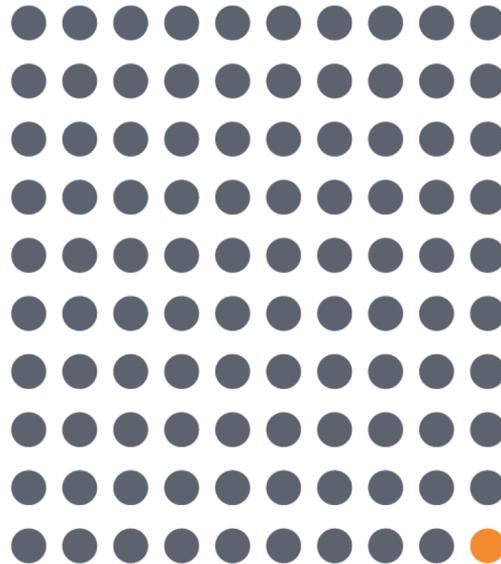
Eight JUULpod flavors were compared to a reference cigarette known as 3R4F.

# REDUCTION IN BIOMARKERS OF EXPOSURE



# SECONDHAND (EXHALED BREATH) VAPOR

- Thirty adult smokers were divided into three groups of 10 and assigned to three different environments designed to simulate residential, office, and hospitality environments.
  - Each group used one product for a 4-hour session in each of the three different simulated settings.
- Air quality was assessed at baseline and after each 4-hour session in which subjects partook of each product as much as desired (*ad libitum*).



Formaldehyde and carbon monoxide in exhaled breath were reduced ~99% with **vapor products** vs. **combustible cigarettes** in a clinical study.



BEHAVIORAL STUDIES

# BEHAVIORAL RESEARCH PLAN

Behaviors and predictors of switching

Understanding risk perception

Efficacy for switching & abstinence among current smokers

Quantify adult, young adult, and youth prevalence



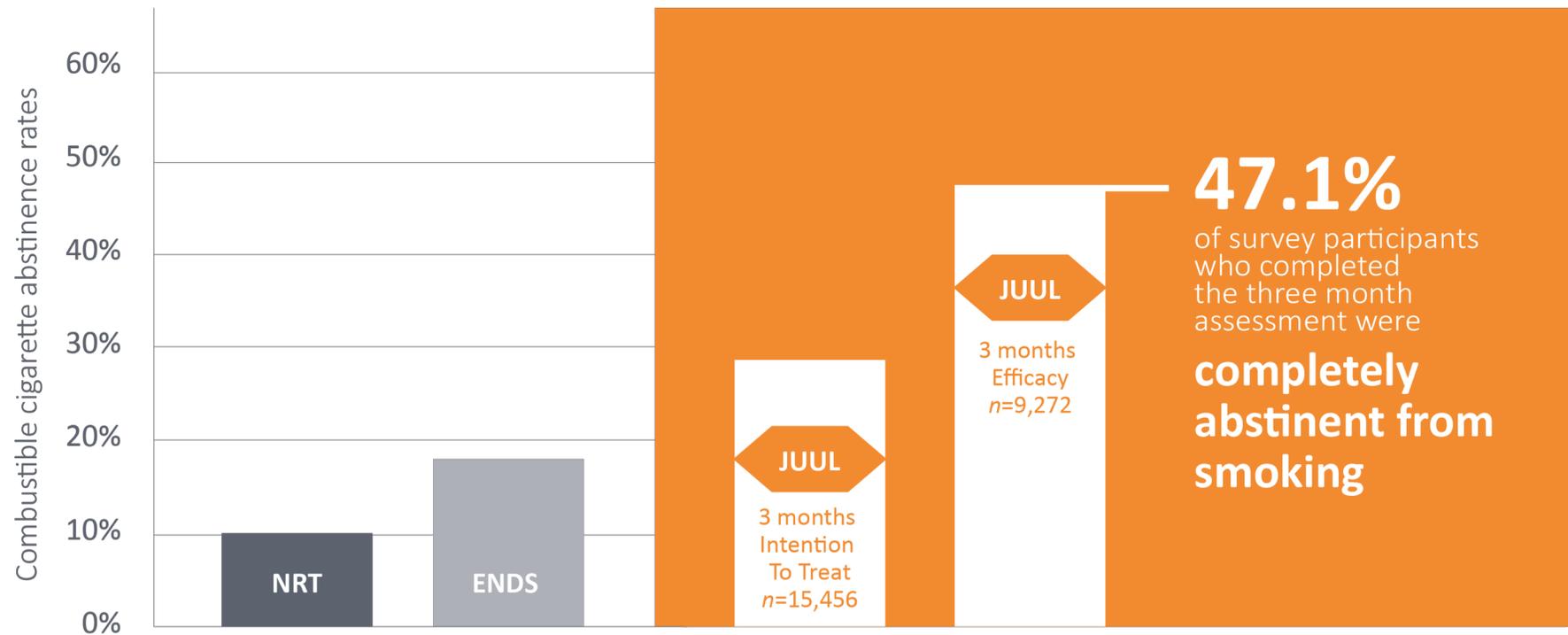
70,000 participants to date

We draw our panels from e-commerce and retail

Plans to expand internationally

# JUUL USE CORRELATED WITH HIGHER RATES OF SWITCHING

## COMPARISON OF ABSTINENCE RATES

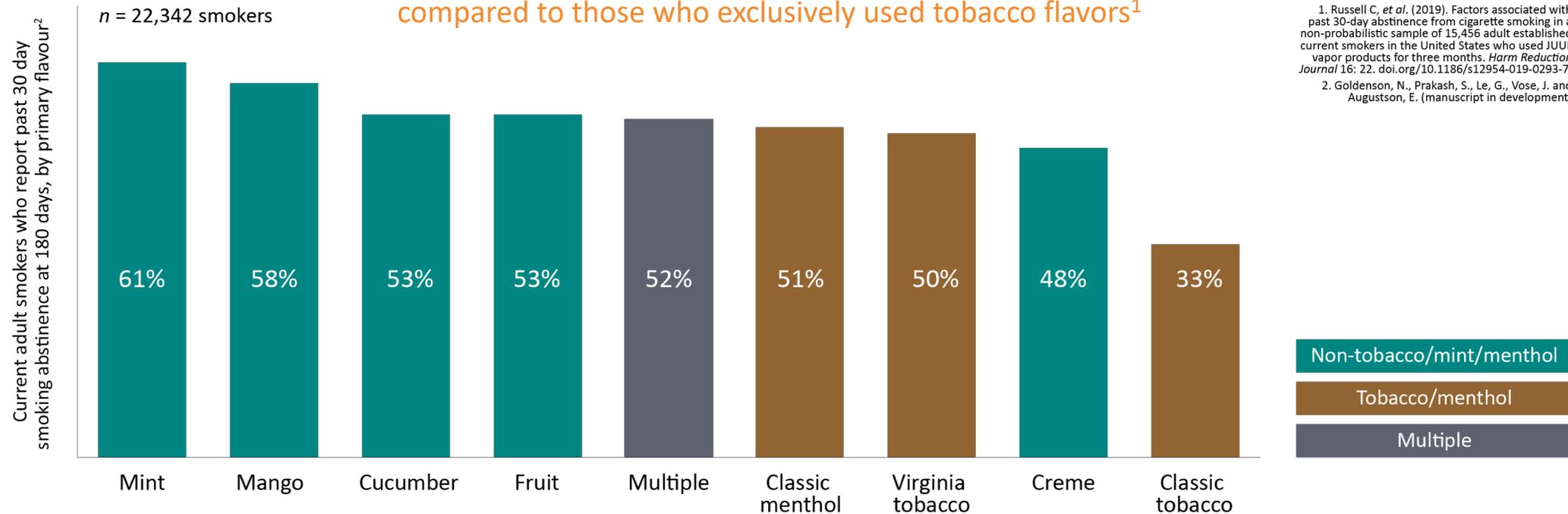


Hajek P, et al. (2019). A randomized trial of e-cigarettes versus nicotine-replacement therapy. *New Engl J Med* 380: 629–637. doi: 10.1056/NEJMoa1808779

Russell C, et al. (2019). Factors associated with past 30-day abstinence from cigarette smoking in a non-probabilistic sample of 15,456 adult established current smokers in the United States who used JUUL vapor products for three months. *Harm Reduction Journal* 16: 22. doi.org/10.1186/s12954-019-0293-7.

# IMPACT OF FLAVOURS ON SWITCHING FROM SMOKING

Participants who had **exclusively used flavors** were **30%** more likely to have **abstained** from smoking at three months compared to those who exclusively used tobacco flavors<sup>1</sup>

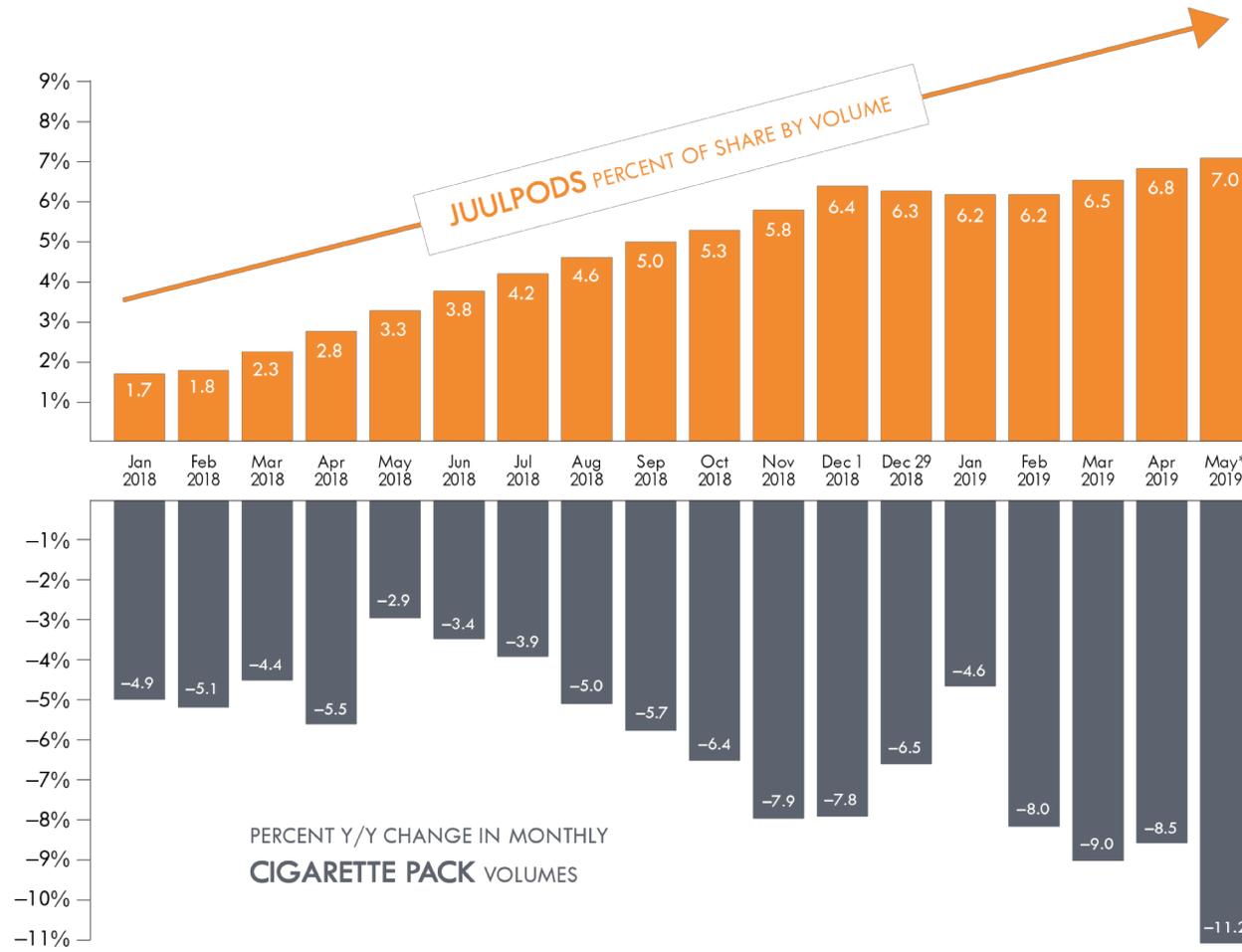


1. Russell C, *et al.* (2019). Factors associated with past 30-day abstinence from cigarette smoking in a non-probabilistic sample of 15,456 adult established current smokers in the United States who used JUUL vapor products for three months. *Harm Reduction Journal* 16: 22. doi.org/10.1186/s12954-019-0293-7.

2. Goldenson, N., Prakash, S., Le, G., Vose, J. and Augustson, E. (manuscript in development)



# DECLINE IN US CIGARETTE SALES IS ACCELERATING



Multiple factors have driven the long-term trend in cigarette declines, but we believe the largest recent contributor, particularly over the past 12 months, has been the growth of **JUUL products as a true alternative** for adult smokers.

\*for the week ending May 19, 2019 / Volume share = cigarette packs + JUULpods / Source: Nielsen

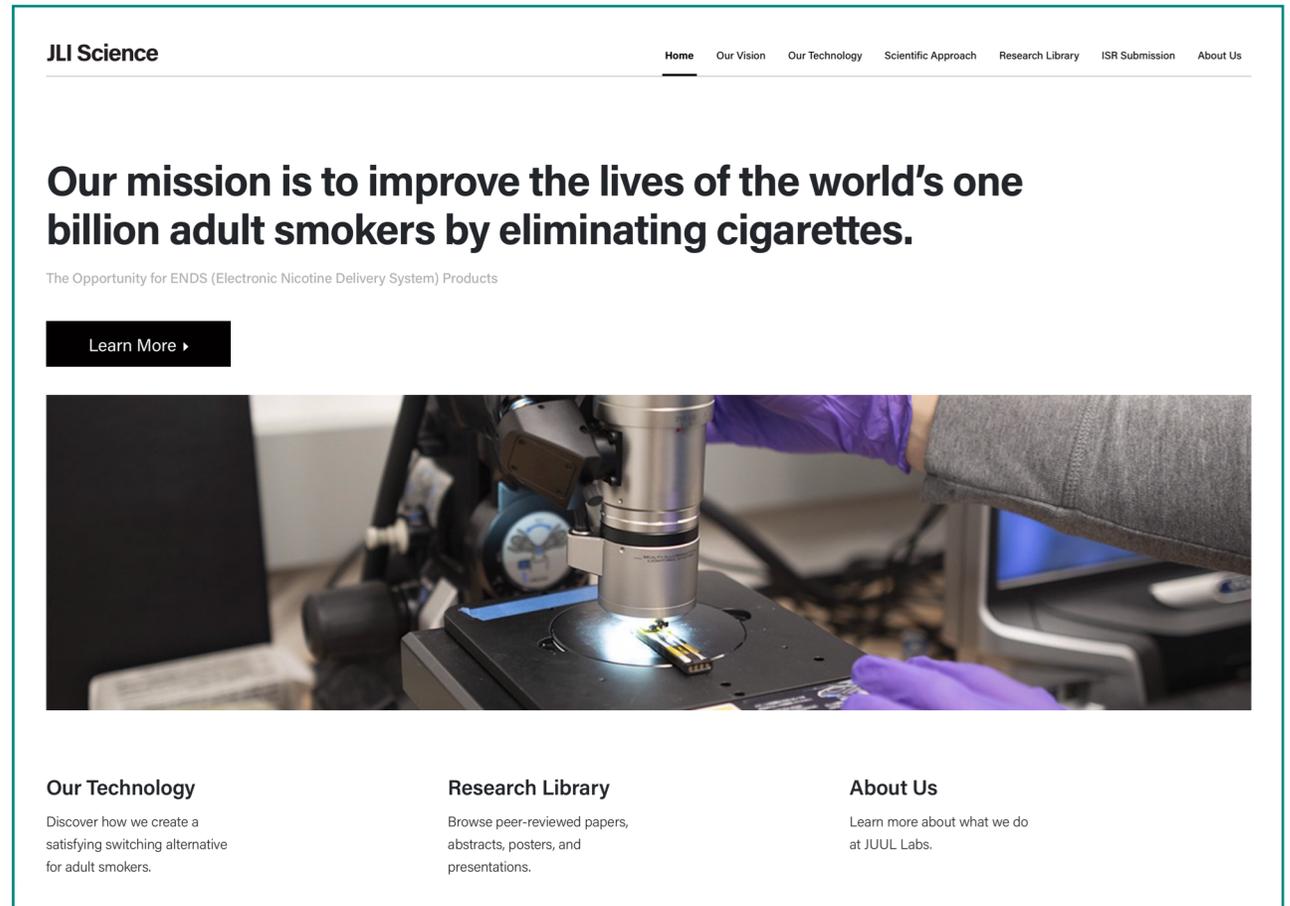
## OTHER RESOURCES: SCIENTIFIC, MEDICAL, AND CLINICAL AFFAIRS

### JLIScience.com

- Portal for the science community
- Repository of key publications and presentations from scientific conferences
- Independent investigators are also able to submit proposals for Investigator Sponsored Research (ISR proposals) on JLIScience.com

### JUUL Newsroom

- Regularly publishes research and policy updates

A screenshot of the JLI Science website. The page has a teal header with the 'JLI Science' logo on the left and a navigation menu on the right containing links for 'Home', 'Our Vision', 'Our Technology', 'Scientific Approach', 'Research Library', 'ISR Submission', and 'About Us'. The main content area features a large heading: 'Our mission is to improve the lives of the world's one billion adult smokers by eliminating cigarettes.' Below this is a sub-heading: 'The Opportunity for ENDS (Electronic Nicotine Delivery System) Products' and a 'Learn More >' button. A large image shows a person in purple gloves using a microscope. At the bottom, there are three columns: 'Our Technology' (Discover how we create a satisfying switching alternative for adult smokers), 'Research Library' (Browse peer-reviewed papers, abstracts, posters, and presentations), and 'About Us' (Learn more about what we do at JUUL Labs).



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