Need a selection of high-resolution pictures for all title (including triangle) slides.
HARM REDUCTION SCIENCE
INVESTING IN SCIENCE TO SUPPORT RISK SPECTRUM
FRAMEWORK TO SUBSTANTIATE HARM REDUCTION POTENTIAL

- Pre-Clinical Studies
- Post-Market Surveillance
- Pre-Market Consumer Studies
- Clinical Studies
- Product Characterisation

Assessment Framework
UP TO 99% REDUCTION IN HARMFUL CHEMICALS

Conventional cigarettes

- Carbon monoxide: 100% reduction
- Carbonyls: >99% reduction
- Phenolics: >99% reduction
- Volatiles: >98% reduction
- Metals: >98% reduction
- TSNAs: >99% reduction
- PAA: >98% reduction
- PAH: >99% reduction

EVP

Air

Carbon monoxide
Carbonyls Phenolics Volatiles Metals TSNAs PAA PAH
SUBSTANTIAL REDUCTION IN TOXICITY IN REGULATORY TESTS

- Cytotoxicity (NRU): >99% reduction
- Bacterial mutagenicity (Ames): >98% reduction
- Genotoxicity (IVM): >99% reduction

Conventional cigarettes vs. EVP vs. Control
IN VITRO PRE-CLINICAL STUDIES PROVIDE A WEIGHT-OF-EVIDENCE APPROACH TO ASSESSING LONG-TERM HEALTH RISKS

2 years in to 5 year research toxicology program

- Cigarettes
- myblu

Biological response

- Respiratory disease
- Cardiovascular disease
- Cancer
IN VITRO PRE-CLINICAL STUDIES PROVIDE A WEIGHT-OF-EVIDENCE APPROACH

myblu did not elicit cell death, oxidative stress or inflammatory markers at 14 times the concentration used for cigarettes\(^+\)

Control

Severely damaged lung tissue after 27 cigarette puffs

27 puffs cigarette smoke

Intact lung tissue after 400 puffs of EVP aerosol

400 puffs e-vapour aerosol

myblu did not elicit any biological response at 80 times the concentration used for cigarettes

Toxicity*

0.4 puffs/ml e-vapour aerosol

0.005 puffs/ml reference cigarette

80 x’s concentration

* Histopathology: Human 3D reconstructed bronchial tissue

* High content screening on human bronchial cells measuring cell stress and death
BIOMARKERS OF EXPOSURE FOR VAPERS INDISTINGUISHABLE FROM QUITTERS

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Cessation</th>
<th>E-cigarettes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNN</td>
<td>98%</td>
<td>91%</td>
</tr>
<tr>
<td>NNK</td>
<td>66%</td>
<td>66%</td>
</tr>
<tr>
<td>Pyrene</td>
<td>70%</td>
<td>66%</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>75%</td>
<td>81%</td>
</tr>
<tr>
<td>Acrolein</td>
<td>87%</td>
<td>82%</td>
</tr>
<tr>
<td>Benzene</td>
<td>94%</td>
<td>93%</td>
</tr>
<tr>
<td>1,3-Butadiene</td>
<td>84%</td>
<td>88%</td>
</tr>
<tr>
<td>Crotonaldehyde</td>
<td>88%</td>
<td>84%</td>
</tr>
<tr>
<td>Acrylonitrile</td>
<td>86%</td>
<td>86%</td>
</tr>
</tbody>
</table>

% reduction of biomarkers between vapers and quitters.
CLINICAL STUDIES SHOW NO HEALTH CONCERNS OVER A 2-YEAR PERIOD

No clinically significant adverse changes
Reduced craving and smoking
Reduced exposure to HPHC
Reduced incidence of airway infection
No cardio-vascular effects

www.imperialbrandsscience.com
VAPING IS NOT A GATEWAY TO SMOKING

/ Dynamic population modelling backed up by real data

/ Of 20,676 frequent US vapers...

/ Only 34 were never smokers that went on to smoke

/ Harm reduction potential to population as a whole

/ Dual users are on a longer journey to smoking abstinence
POST-MARKET SURVEILLANCE ACTIVITIES

- Evaluate scientific & medical literature
- Assess consumer health complaints
- Monitor notifications to regulators
- Studies to assess benefit/impact on population
SUBSTANTIAL PRODUCT ASSESSMENT IS ESSENTIAL TO EVALUATE SAFETY AND HARM REDUCTION POTENTIAL

Product Characterisation
Pre-Clinical Studies
Clinical Studies
Pre-Market Consumer Studies
Post-Market Surveillance

http://www.fontemscience.com/