



A Model of In Vitro Exposure to Aerosols at the Air-Liquid Interface:

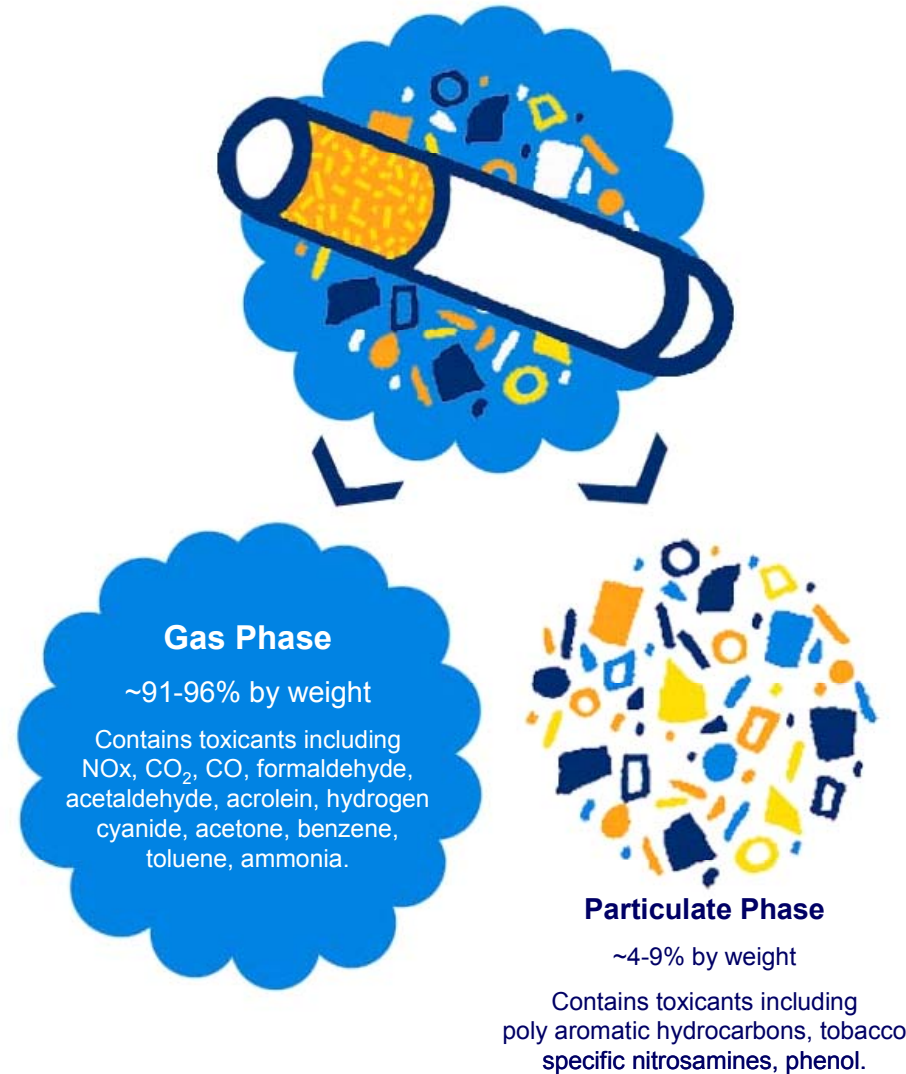
**A System for Assessing the
Toxicity of Mainstream
Cigarette Smoke**

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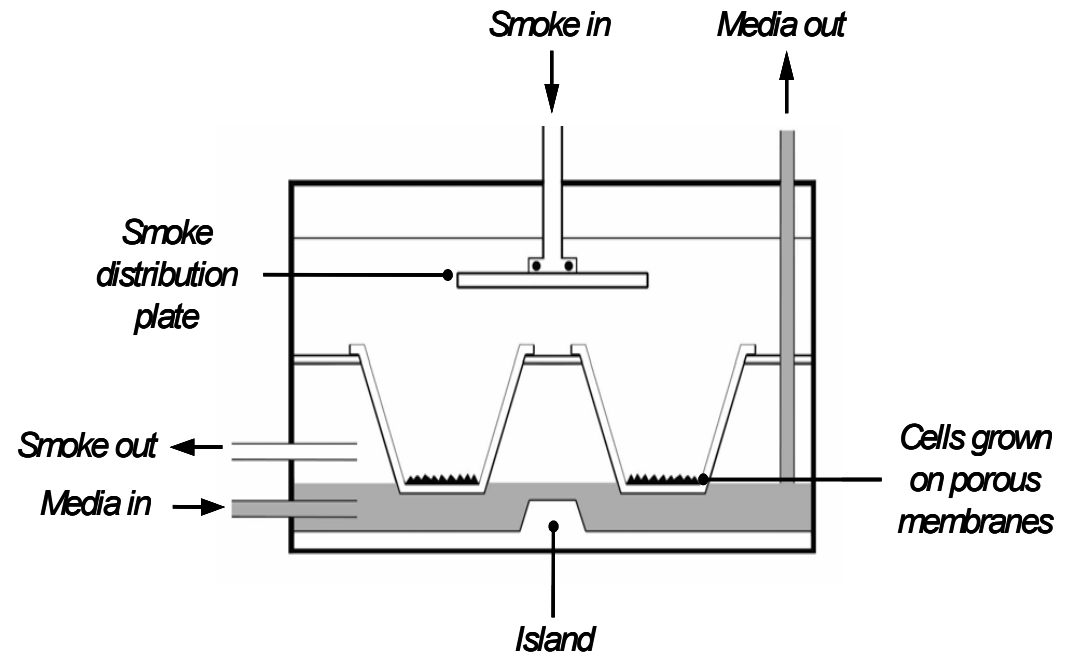


What is Cigarette Smoke?





Exposure Chamber

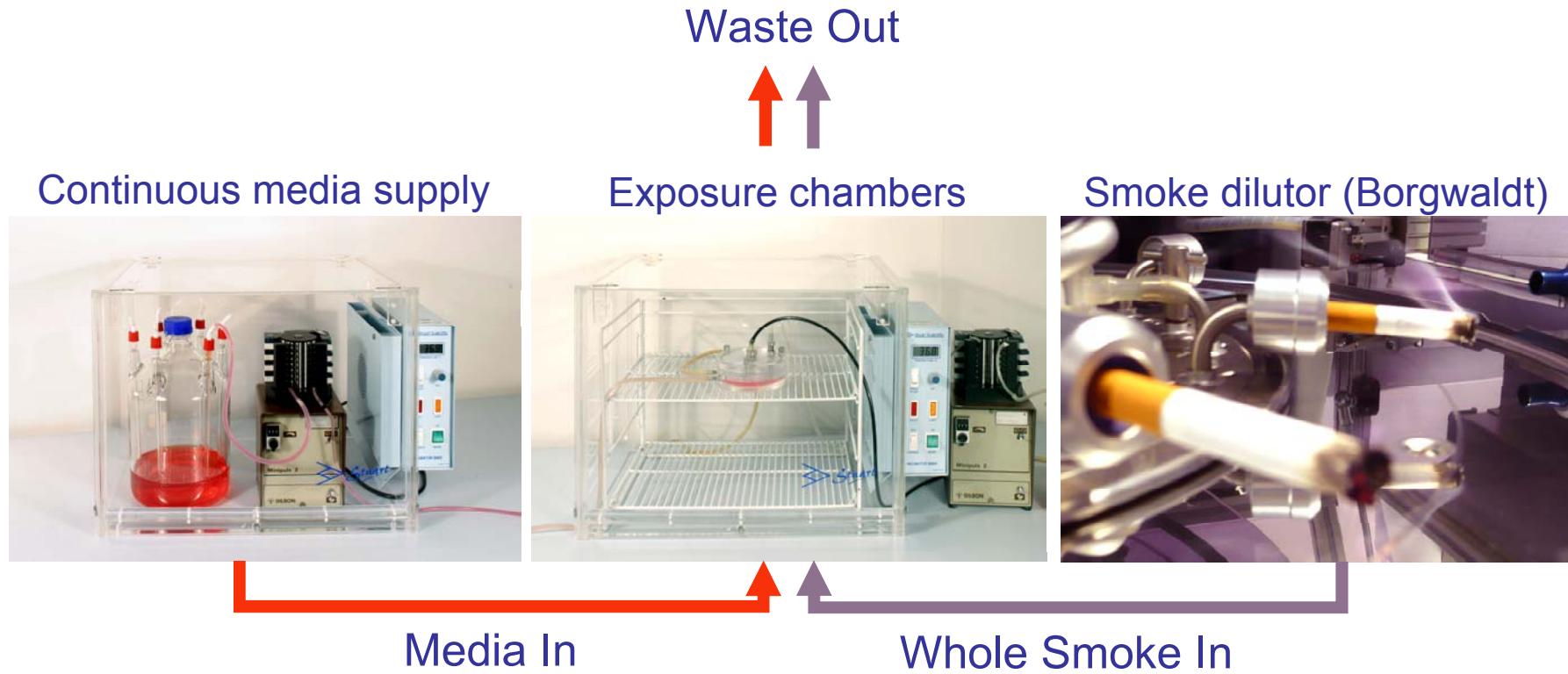


(Patent publication No. WO 03/100417 A1)

Phillips et al.,
ATLA
33: 239–248 2005

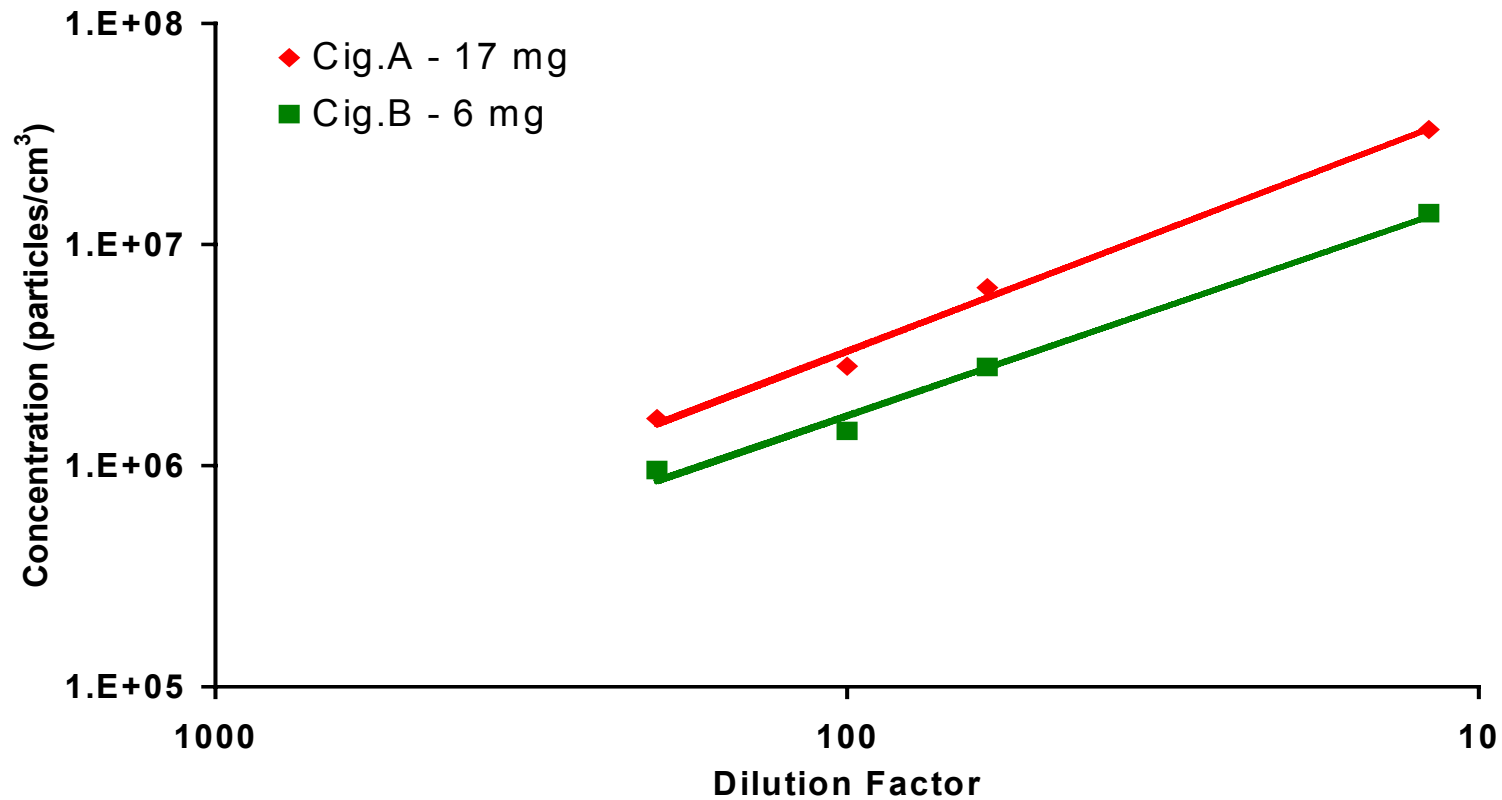


Exposure System





Particle Concentration



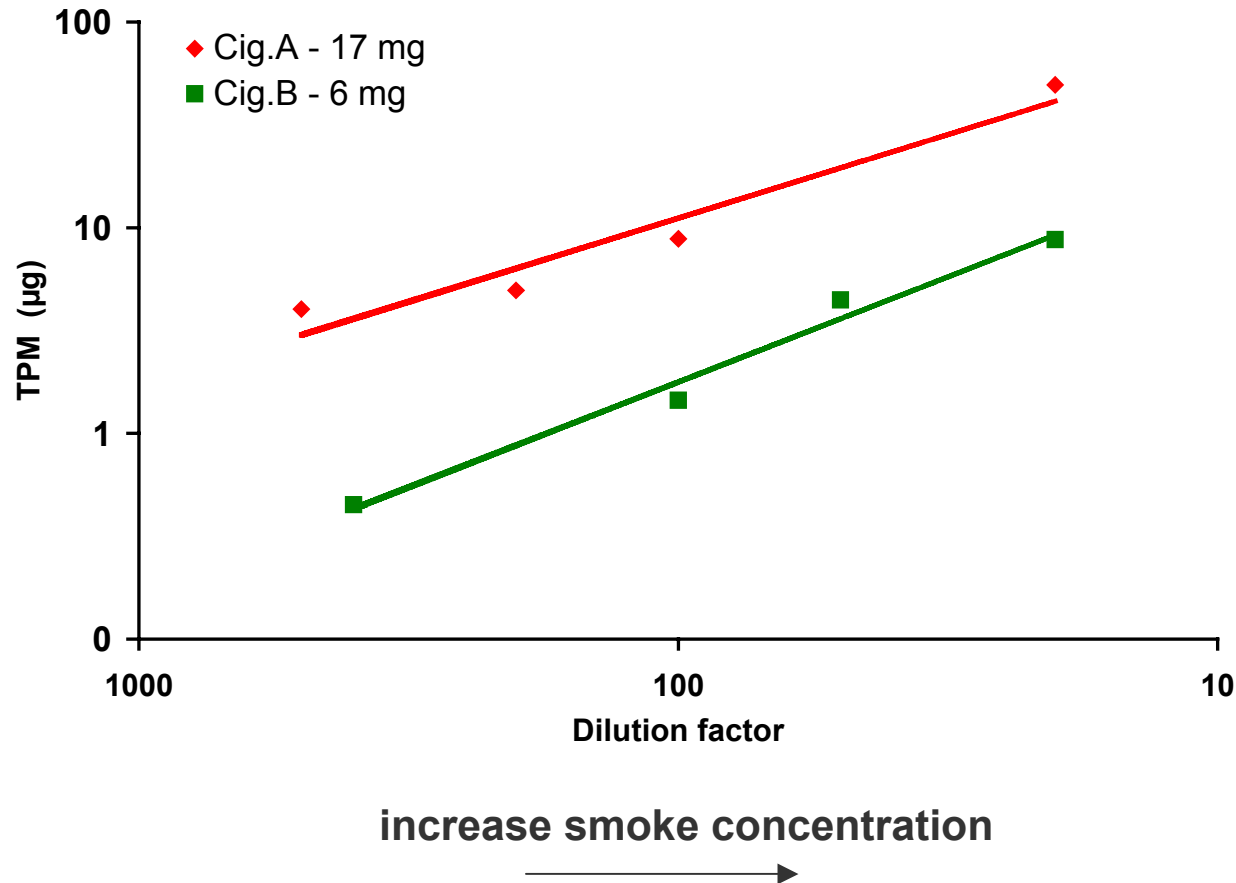
increase smoke concentration



Phillips *et al.*,
ATLA
33: 239–248 2005



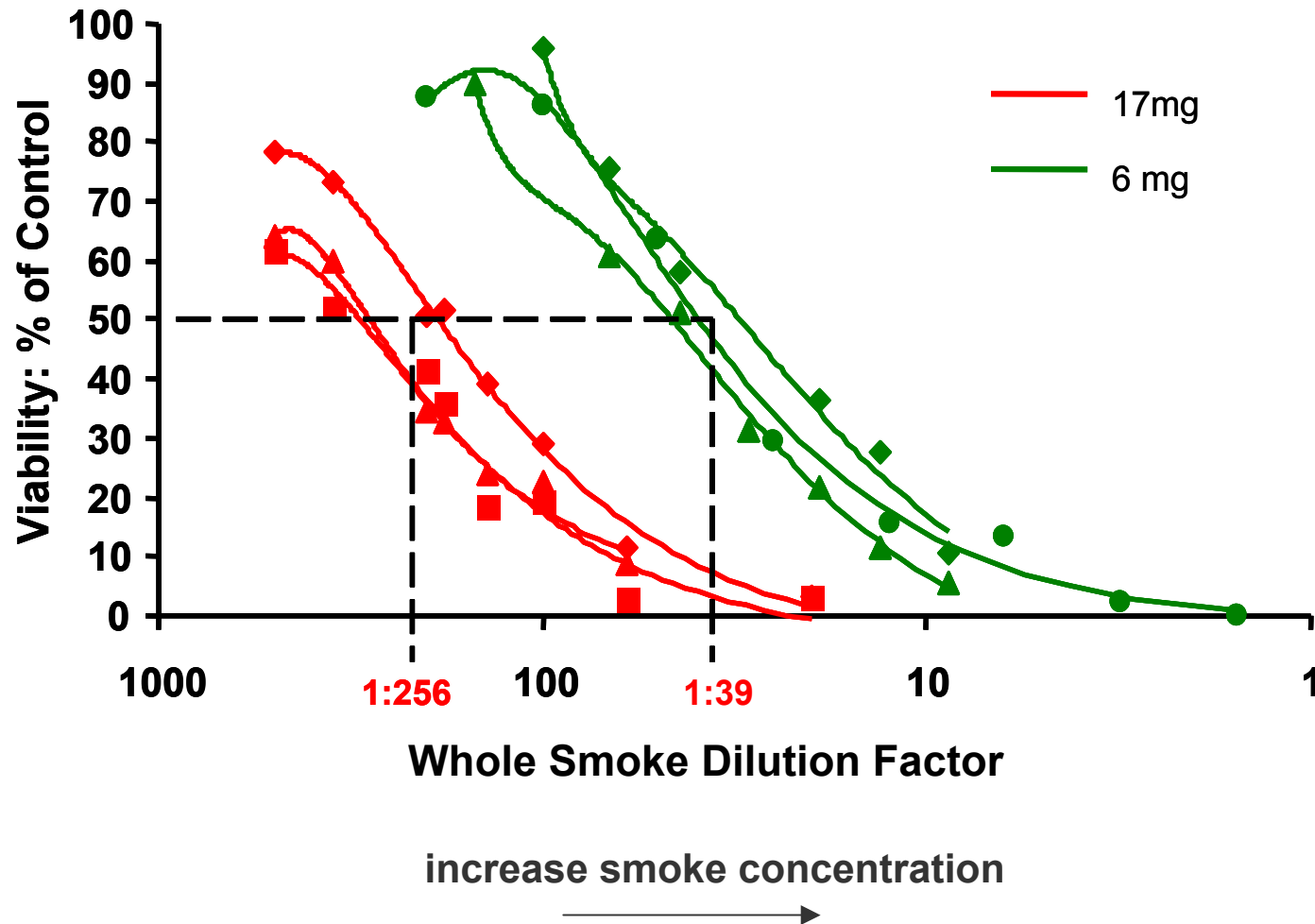
Particle Deposition



- Deposition *in vitro* = 0.1-4 µg/cm² per cigarette
- Deposition *in vivo* = 0.05-1.34 µg/cm² per cigarette



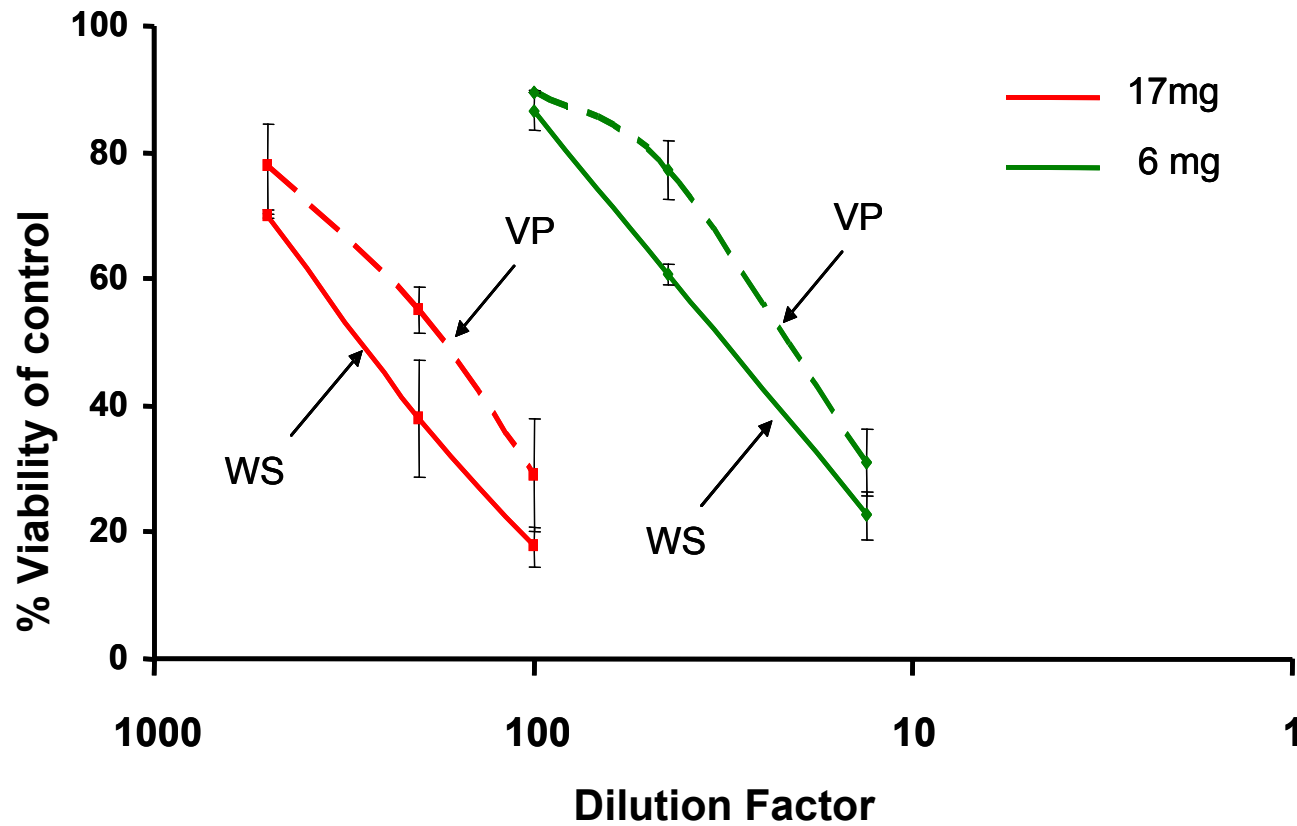
H292- Cytotoxic Response measured by Neutral Red Uptake: 17mg vs. 6mg



- Difference between the cytotoxic responses
- 17mg more cytotoxic than the 6 mg



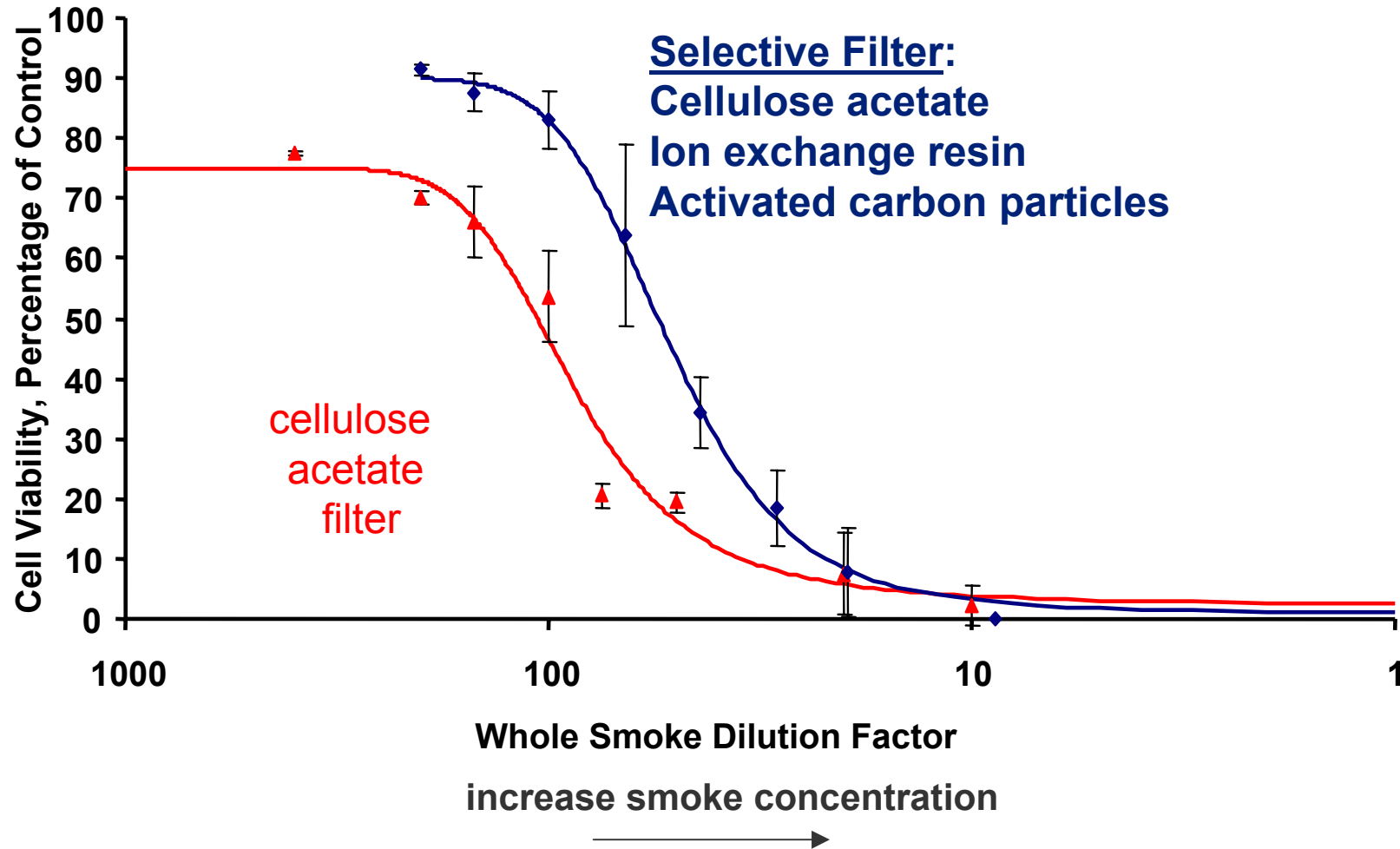
H292- Whole Smoke vs. Vapour Phase



- ~ 80% of total response attributable to the Vapour Phase



H292 Cytotoxicity Dose-Response

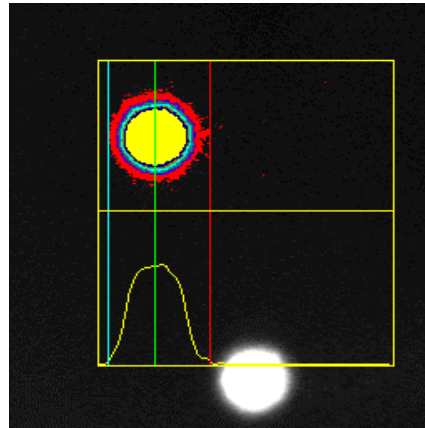


Difference between the two cigarette designs

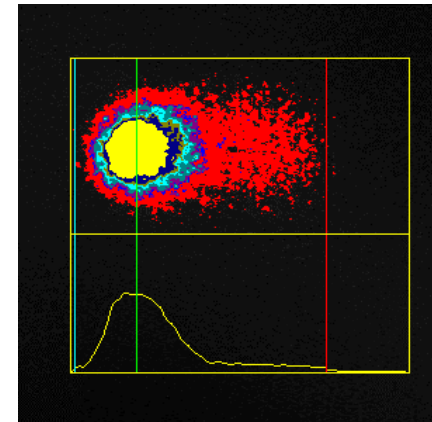
BAT unpublished data



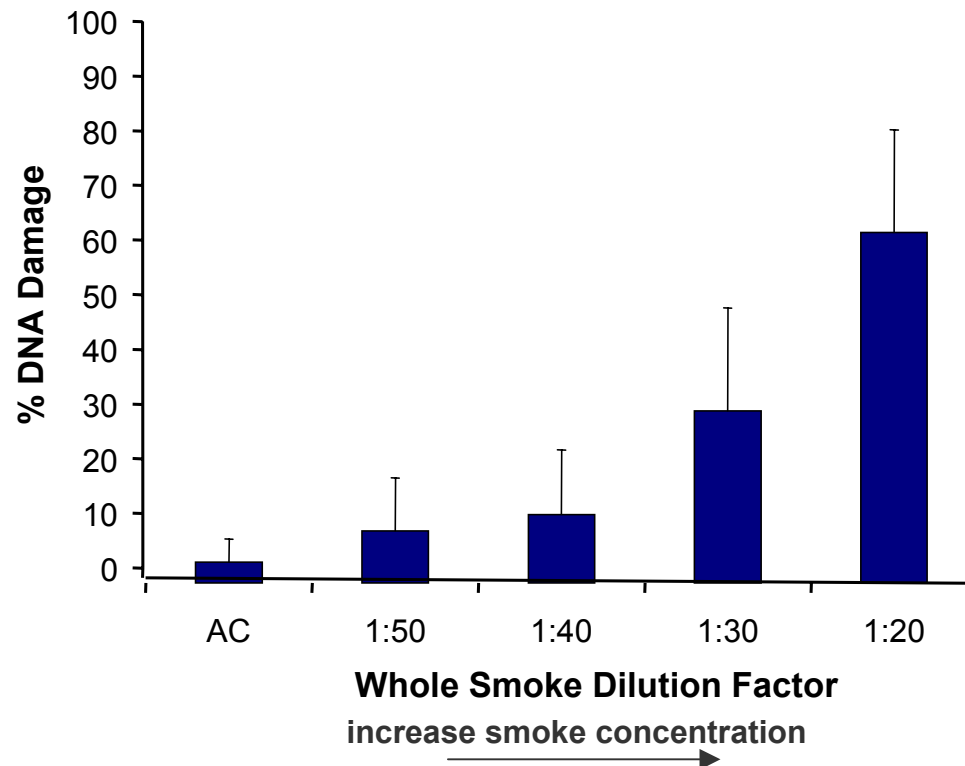
H292- Comet Assay



Sham treated cell



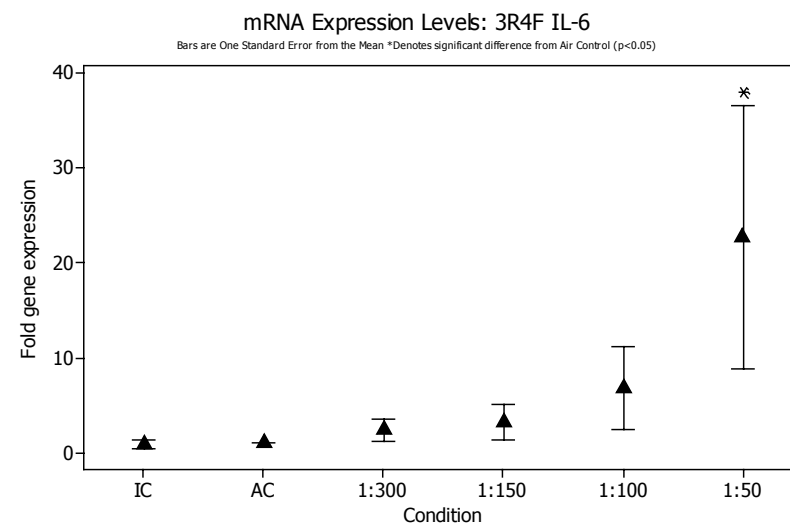
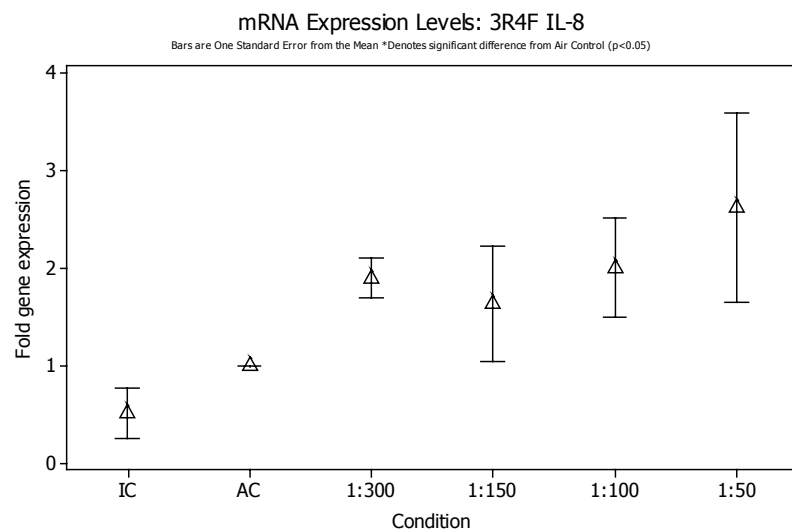
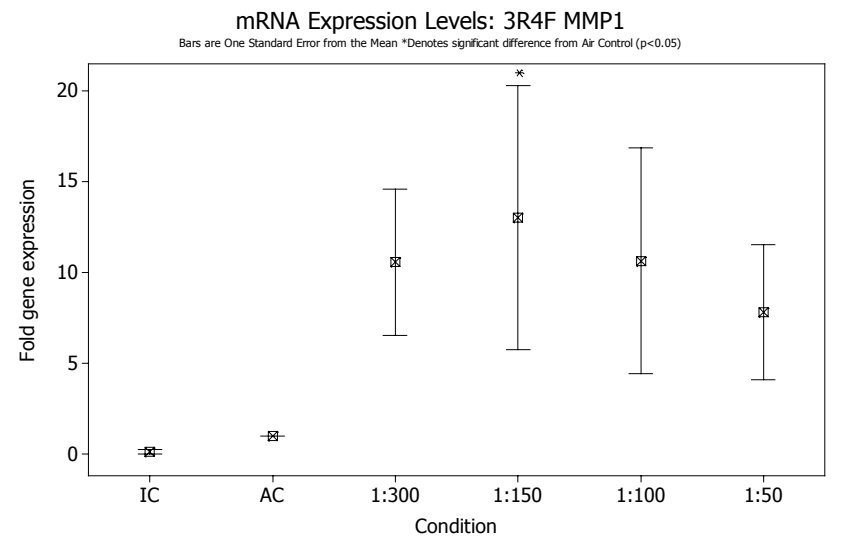
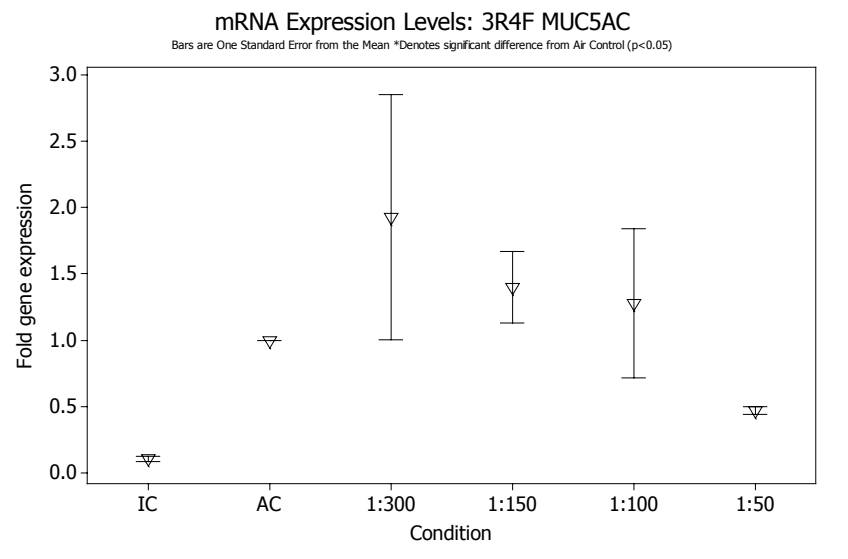
Treated cell



D Thorne *et al.*,
Mutation Research
673: 3–8 2008



H292- Gene Expression Levels



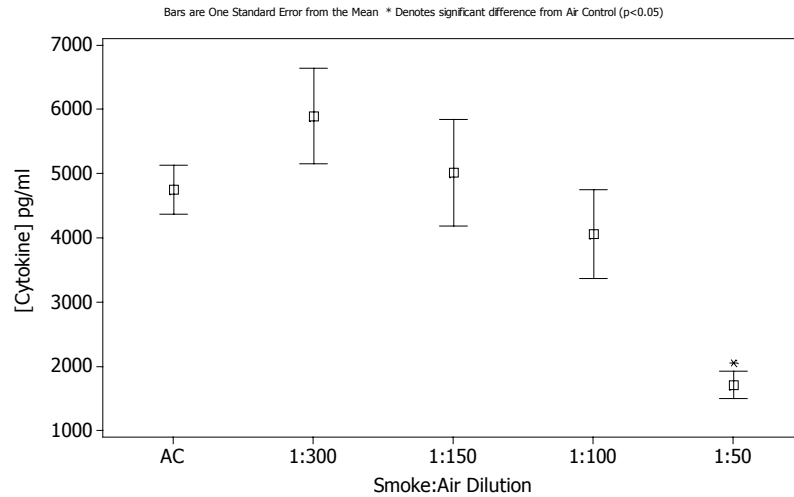
BAT unpublished data



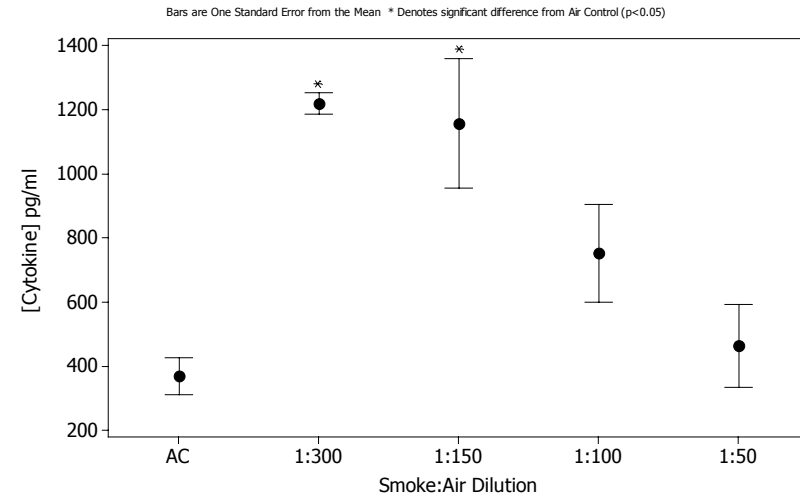
H292- Protein Expression



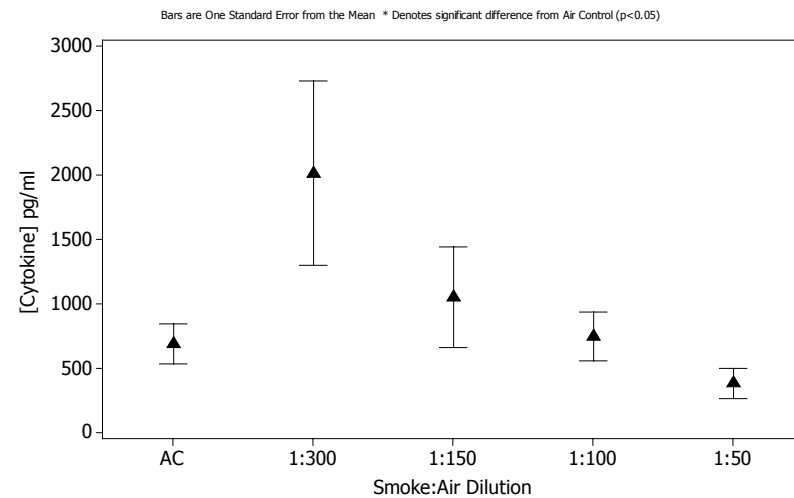
Cytokine Levels: 3R4F VEGF



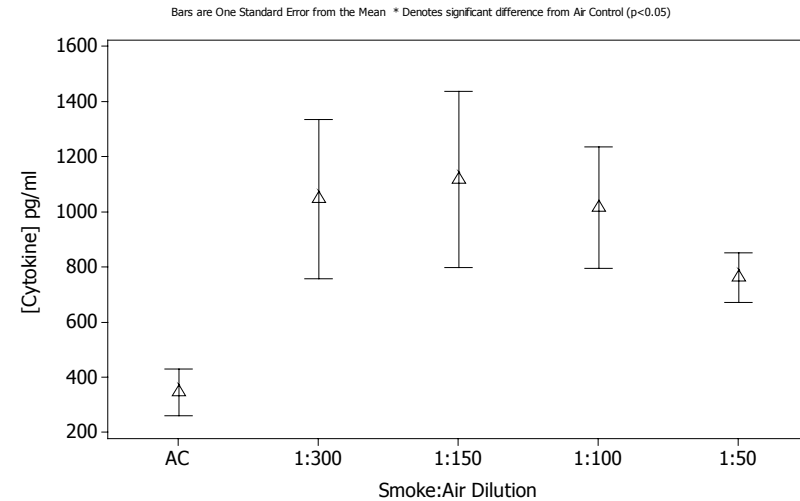
Cytokine Levels: 3R4F MMP-1



Cytokine Levels: 3R4F IL-6



Cytokine Levels: 3R4F IL-8





Conclusion



Flexible, reproducible system that delivers biologically relevant concentrations of whole smoke to cultures at the air-liquid interface

Exposure of Bronchial Epithelial Cells to Whole Cigarette Smoke: Assessment of Cellular Responses. Phillips et al, ATLA 2005 33(3):239-248

www.bat-science.com

Future applications

Evaluation of cigarette design modifications

Investigate individual components of cigarette smoke

Other types of aerosols e.g., air pollutants, cosmetic aerosols and inhaled pharmaceuticals



Acknowledgements



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