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| **Third-hand E-Cigarette Vapour Exposure Causes Pulmonary Effects in Mice** |
| Andrew E. Thorpe1,2, Chantal Donovan1,2,3, Richard Kim1,2,3, Howard Vindin2,4, Razia Zakayra1,5, Hanna Miyayi1, Yik L. Chan1, David Van Reyk1, Hui Chen1, Brian G.G. Oliver1,2 |
| 1School of Life Sciences, Faculty of Science, University of Technology Sydney, Sydney, NSW 2007, Australia  2Respiratory Cellular and Molecular Biology, Woolcock Institute of Medical Research, Macquarie University, Glebe, NSW 2037, Australia  3Immune Health Program, Hunter Medical Research Institute, University of Newcastle, Newcastle, NSW 2000, Australia  4School of Life and Environmental Sciences, Faculty of Science, Charles Perkins Centre, The University of Sydney, Sydney, NSW 2006, Australia  5Epigenetics of Chronic Disease, Woolcock Institute of Medical Research, Macquarie University, Glebe, NSW 2037, Australia |
| **Introduction/Aim:**  In the past decade, there have been an estimated 82 million e-cigarette users worldwide, representing a tremendous increase in e-cigarette popularity. Particularly in young children, third-hand exposure to e-cigarettes occurs as a result of chemical residues left behind on clothing and surfaces by e-cigarette aerosol. Due of their invisibility, very little is known about the health effects of long-term exposure to third-hand e-cigarette smoke, which was the purpose of this investigation.  **Methods:**  Male BALB/c mice (4 weeks of age) were housed with a towel exposed to nicotine free (0mg/mL) or containing (18 mg/mL) e-vapours that were replaced daily for 4 weeks. At the endpoint, mice were subject to lung function testing. Lungs were collected for analysis.  **Results:**  Central and transpulmonary resistance, tissue damping, and tissue elastance was reduced (p<0.05,p<0.01, 18mg vs SHAM). There was an increase in large airway epithelial thickness (p<0.05, 18mg vs 0mg) and epithelial layers in both large (p<0.05, 18mg vs 0mg) and small airways (p<0.01, 18mg vs 0mg & SHAM) by third-hand nicotine-containing e-cigarette exposure. Alveolar disruption was increased by both nicotine-free e-cigarette (p<0.001, 0mg vs SHAM) and nicotine-containing e-cigarette (p<0.0001, 18mg vs SHAM). Collagen was increased in the small airway by nicotine-containing third-hand e-cigarette (p<0.05, 18mg vs SHAM). Fibronectin was decreased in nicotine containing e-cigarette exposure (p<0.05, 18mg vs SHAM).  An increased trend of smooth muscle thickness was observed in third hand containing e-cigarette exposure. Mucus cells showed an increased trend in nicotine free e-cigarette.  **Conclusion:**  The lung health of young mice can be severely affected by third-hand exposure to e-cigarettes, particularly nicotine-containing e-cigarettes. Greater public knowledge of the dangers of third-hand exposure to e-cigarettes is required to decrease these adverse health effects.  **Grant Support:** Project was supported by NHMRC project grant (APP1158186) |