

# Tobacco in Australia

## Facts & Issues

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### Relevant news and research

#### 3.24 Genetic influences on tobacco-caused disease

Last updated October 2020

#### Research:

Bray, MJ, Chen, LS, Fox, L, Hancock, DB, Culverhouse, RC, Hartz, SM et al. (2020). Dissecting the genetic overlap of smoking behaviors, lung cancer, and chronic obstructive pulmonary disease: A focus on nicotinic receptors and nicotine metabolizing enzyme. *Genet Epidemiol*. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/32803792>

Thom, CS, Ding, Z, Levin, MG, Damrauer, SM, Lee, KM, Lynch, J et al. (2020). Genetic determinants of increased body mass index mediate the effect of smoking on increased risk for type 2 diabetes risk but not coronary artery disease. *Hum Mol Genet*. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/32833022>

Brhane, Y, Yang, P, Christiani, DC, Liu, G, McLaughlin, JR, Brennan, P et al (2020). Genetic determinants of lung cancer prognosis in never smokers: A pooled analysis in the International Lung Cancer Consortium. *Cancer Epidemiol Biomarkers Prev*. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/32699080>

Deutsch, AR, & Selya, AS. (2020). Stability in effects of different smoking-related polygenic risk scores over age and smoking phenotypes. *Drug Alcohol Depend*, 214, 108154. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/32645681>

Xu, T, Monir, MM, Lou, XY, Xu, H, & Zhu, J. (2020). Conditional and unconditional genome-wide association study reveal complicate genetic architecture of human body weight and impacts of smoking. *Sci Rep*, 10(1), 12136. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/32699216>

Chen, C, Yang, M, Dou, LP, Ling, DM, & Huang, S. (2020). Association of the interaction between the rs9619311 and rs402007 polymorphisms and smoking with essential hypertension in Chinese Han population. *Medicine (Baltimore)*, 99(23), e20552. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/32502021>

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## Facts & Issues

---

Kudhair, BK, Alabid, NN, Zayed, KS, Lafta, IJ, & Taheri-Kafrani, A. (2020). The correlation of combined OGG1, CYP1A1 and GSTP1 gene variants and risk of lung cancer of male Iraqi waterpipe tobacco smokers. *Mol Biol Rep*. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/32577993>

Mishra, PP, Hanninen, I, Raitoharju, E, Marttila, S, Mishra, BH, Mononen, N et al (2020). Epigenome-450K-wide methylation signatures of active cigarette smoking: the Young Finns Study. *Biosci Rep*. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/32583859>

Purohit, A, Purohit, BM, Mani, A, & Bhambal, A. (2020). Genetic Implications of HLA-DR and HLA-DQ Genotype on Tobacco Smoking and Oral Submucous Fibrosis. *Oral Health Prev Dent*, 18(3), 455-460. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/32515416>

Roy, N, Gaudet, D, Tremblay, G, & Brisson, D. (2020). Association of common gene-smoking interactions with elevated plasma apolipoprotein B concentration. *Lipids Health Dis*, 19(1), 98. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/32430061>

Morrow, JD, Make, B, Regan, E, Han, M, Hersh, CP, Tal-Singer, R et al. (2020). DNA Methylation is Predictive of Mortality in Current and Former Smokers. *American Journal of Respiratory and Critical Care Medicine*. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31995399>

Chen, G, Hu, C, Song, Y, Zhang, H, Li, S, Lai, P et al. (2019). Effects of IL-4-590C/T (rs2243250) Polymorphism on the Susceptibility of Smoking-Related Cancer: A Meta-Analysis Involving 11,407 Subjects. *Biomed Res Int*, 2019, 3104176. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31871935>

Laczanski, L, Laczanska, I, & Lwow, F. (2019). Association of select vitamin D receptor gene polymorphisms with the risk of tobacco-related cancers - a meta-analysis. *Sci Rep*, 9(1), 16026. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31690771>

Lv, X, Cui, Z, Li, H, Li, J, Yang, Z, Bi, Y et al. (2019). Association between polymorphism in CDKN2B-AS1 gene and its interaction with smoking on the risk of lung cancer in a Chinese population. *Hum Genomics*, 13(1), 58. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31775885>

Zong, D, Liu, X, Li, J, Ouyang, R, & Chen, P. (2019). The role of cigarette smoke-induced epigenetic alterations in inflammation. *Epigenetics Chromatin*, 12(1), 65. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31711545>

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# Tobacco in Australia

## Facts & Issues

---

Huang, J, Jiang, W, Tong, X, Zhang, L, Zhang, Y, & Fan, H. (2019). Identification of gene and microRNA changes in response to smoking in human airway epithelium by bioinformatics analyses. *Medicine (Baltimore)*, 98(38), e17267. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31568004>

Yang, P, Wu, P, Liu, X, Feng, J, Zheng, S, Wang, Y, & Fan, Z. (2019). Interaction between eNOS gene polymorphism and current smoking on susceptibility to coronary heart disease in Chinese people. *Coron Artery Dis*. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31567371>

Dugue, PA, Jung, CH, Joo, JE, Wang, X, Wong, EM, Makalic, E et al (2019). Smoking and blood DNA methylation: an epigenome-wide association study and assessment of reversibility. *Epigenetics*, 1-11. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31552803>

Kaur, G, Begum, R, Thota, S, & Batra, S. (2019). A systematic review of smoking-related epigenetic alterations. *Arch Toxicol*. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31555878>

Bollepalli, S, Korhonen, T, Kaprio, J, Anders, S, & Ollikainen, M. (2019). EpiSmokEr: a robust classifier to determine smoking status from DNA methylation data. *Epigenomics*. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31466478>

Arimilli, S, Makena, P, Liu, G, & Prasad, GL. (2019). Global gene expression profiles from PBMCs treated with reference tobacco product preparations. *Data Brief*, 25, 103970. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31297406>

Herceg, Z, & Ambatipudi, S. (2019). Smoking-associated DNA methylation changes: no smoke without fire. *Epigenomics*. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31339344>

Sugitani, A, Asai, K, Watanabe, T, Suzumura, T, Kojima, K, Kubo, H et al. (2019). A Polymorphism rs6726395 in Nrf2 Contributes to the Development of Emphysema-Associated Age in Smokers Without COPD. *Lung*. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31297601>

Yamaguchi, NH. (2019). Smoking, immunity, and DNA damage. *Transl Lung Cancer Res*, 8(Suppl 1), S3-S6. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31211100>

Bergen, AW, Do, EK, Chen, LS, & David, SP. (2019). Tobacco Genomics: Complexity and Translational Challenges. *Nicotine Tob Res*, 21(6), 705-706. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31111930>

tobaccoinaustralia.org.au

# Tobacco in Australia

## Facts & Issues

---

Matoba, N, Akiyama, M, Ishigaki, K, Kanai, M, Takahashi, A, Momozawa, Y et al. (2019). GWAS of smoking behaviour in 165,436 Japanese people reveals seven new loci and shared genetic architecture. *Nat Hum Behav*, 3(5), 471-477. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/31089300>

Pasman, JA, Verweij, KJH, & Vink, JM. (2019). Systematic Review of Polygenic Gene-Environment Interaction in Tobacco, Alcohol, and Cannabis Use. *Behav Genet*. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/31111357>

Sung, YJ, de Las Fuentes, L, Winkler, TW, Chasman, DI, Bentley, AR, Kraja, AT et al. (2019). A multi-ancestry genome-wide study incorporating gene-smoking interactions identifies multiple new loci for pulse pressure and mean arterial pressure. *Hum Mol Genet*. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/31127295>

Volchenkov, R, Matthews, J, Zucknick, M, & Skalhegg, BS. (2019). Shared epitope is associated with the reactivity of Th17 cells to cigarette smoke extract regardless of smoking history. *Cell Mol Immunol*. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/31076726>

Liu, J, Zhao, W, Ammous, F, Turner, ST, Mosley, TH, Zhou, X, & Smith, JA. Longitudinal analysis of epigenome-wide DNA methylation reveals novel smoking-related loci in African Americans. *Epigenetics*, 2019. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/30764717>

Owens, L, Laing, IA, Murdzoska, Z, Zhang, G, Turner, SW, & Le Souef, PN. Glutathione S-Transferase Genotype Protects Against In Utero Tobacco Linked Lung Function Deficits. *Am J Respir Crit Care Med*, 2019. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/30726102>

Al-Obaide, MA I, Abdel-Salam, AG, Al-Hmoud, ND, Hassani, HH, & Verma, JP. Editorial: Bioinformatics and Biostatistics Applications in Tobacco Smoking Research. *Front Public Health*, 2018. 6, 366. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/30619807>

Brazel, DM, Jiang, Y, Hughey, JM, Turcot, V, Zhan, X, Gong, J et al. Exome Chip Meta-analysis Fine Maps Causal Variants and Elucidates the Genetic Architecture of Rare Coding Variants in Smoking and Alcohol Use. *Biol Psychiatry*, 2018. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/30679032>

Erzurumluoglu, AM, Liu, M, Jackson, VE, Barnes, DR, Datta, G, Melbourne, CA et al. Meta-analysis of up to 622,409 individuals identifies 40 novel smoking behaviour associated genetic loci. *Mol Psychiatry*, 2019. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/30617275>

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# Tobacco in Australia

## Facts & Issues

---

Gupta, R, van Dongen, J, Fu, Y, Abdellaoui, A, Tyndale, RF, Velagapudi, V et al. Epigenome-wide association study of serum cotinine in current smokers reveals novel genetically driven loci. *Clin Epigenetics*, 2019. 11(1), 1. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/30611298>

Loiselle, JJ, Knee, JM, & Sutherland, LC. Data relating to the transcriptomes of human lung epithelial cells exposed to radon-emitting rock, tobacco smoke or cannabis smoke. *Data Brief*, 2018. 21, 1568-1572. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6240624/pdf/main.pdf>

Loiselle, JJ, Knee, JM, & Sutherland, LC. Human lung epithelial cells cultured in the presence of radon-emitting rock experience gene expression changes similar to those associated with tobacco smoke exposure. *J Environ Radioact*, 2018. 196, 64-81. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/30396064>

McCartney, DL, Stevenson, AJ, Hillary, RF, Walker, RM, Bermingham, ML, Morris, SW et al. Epigenetic signatures of starting and stopping smoking. *EBioMedicine*, 2018. Available from: [https://www.ebiomedicine.com/article/S2352-3964\(18\)30471-7/pdf](https://www.ebiomedicine.com/article/S2352-3964(18)30471-7/pdf)

Andersson, BA, Sayardoust, S, Lofgren, S, Rutqvist, LE, & Laytragoon-Lewin, N. Cigarette smoking affects microRNAs and inflammatory biomarkers in healthy individuals and an association to single nucleotide polymorphisms is indicated. *Biomarkers*, 2018. 1-17. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/30375257>

McGinnis, KA, Justice, AC, Tate, JP, Kranzler, HR, Tindle, HA, Becker, WC et al. Using DNA methylation to validate an electronic medical record phenotype for smoking. *Addict Biol*, 2018. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/adb.12670>

Tsai, PC, Glastonbury, CA, Eliot, MN, Bollepalli, S, Yet, I, Castillo-Fernandez, JE et al. Smoking induces coordinated DNA methylation and gene expression changes in adipose tissue with consequences for metabolic health. *Clin Epigenetics*, 2018. 10(1), 126. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/30342560>

Holm, KE, Mannino, DM, Choate, R, & Sandhaus, RA. Genotype is associated with smoking and other key health behaviors among individuals with alpha-1 antitrypsin deficiency-associated lung disease. *Respir Med*, 2018. 143, 48-55. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/30261992>

Prince, C, Hammerton, G, Taylor, AE, Anderson, EL, Timpson, NJ, Smith, GD, et al. Investigating the impact of cigarette smoking behaviours on DNA methylation patterns in adolescence. *Hum Mol Genet*, 2018. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/30215712>

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## Facts & Issues

---

Haase, T, Muller, C, Krause, J, Rothemeier, C, Stenzig, J, Kunze, S, Waldenberger, M, Munzel, T, Pfeiffer, N, Wild, P S, Michal, M, Marini, F, Karakas, M, Lackner, KJ, Blankenberg, S, Zeller, T. Novel DNA Methylation Sites Influence GPR15 Expression in Relation to Smoking. *Biomolecules*. 2018 Aug 20;8(3). Available from: <https://www.ncbi.nlm.nih.gov/pubmed/30127295>

Alghanim, H, Wu, W, McCord, B. DNA methylation assay based on pyrosequencing for determination of smoking status. *Electrophoresis*, June 2018. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29956353>

Billatos, E, Faiz, A, Gesthalter, YO, LeClerc, A, Alekseyev, Y, Zhang, X, Liu, G, Ten Hacken, NHT, Heijink, I, Timens, W, Brandsma, CA, Postma, DS, van den Berge, M, Spira, A, Lenburg, ME. The Impact of Acute Exposure to Cigarette Smoke on Airway Gene Expression. *Physiol Genomics*, June 2018. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29932825>

Fujii, T, Shimada, K, Nakai, T, Ohbayashi, C. MicroRNAs in Smoking-Related Carcinogenesis: Biomarkers, Functions, and Therapy. *J Clin Med*. 2018 May 1;7(5). Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29723992>

Fusco, JP, Pita, G, Pajares, MJ, Andueza, MP, Patino-Garcia, A, de-Torres, JP, Gurrpide, A, Zulueta, J, Alonso, R. Genomic characterization of individuals presenting extreme phenotypes of high and low risk to develop tobacco-induced lung cancer. *Cancer Med*, May 2018. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29766673>

Kopa, PN, Pawliczak, R. Effect of smoking on gene expression profile - overall mechanism, impact on respiratory system function, and reference to electronic cigarettes. *Toxicol Mech Methods*. 2018 Jul;28(6):397-409. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29656668>

Xiong, Y, Xi, S, Shan, J, Hekimoglu, E, Hsiao, SH, Zhang, M, Hong, JA, Tao, C, Chen, H, Ripley, RT, Hoang, CD, Schrupp, DS. Epigenomic Alterations and Gene Expression Profiles in Human Respiratory Epithelial Cells Mediated by Hookah and Cigarette Smoke. *Ann Am Thorac Soc*. 2018 Apr;15(Supplement\_2):S124-S125. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29676637>

Huang, Y, Hui, Q, Walker, DI, Uppal, K, Goldberg, J, Jones, DP, Vaccarino, V, Sun, YV. Untargeted metabolomics reveals multiple metabolites influencing smoking-related DNA methylation. *Epigenomics*. 2018. Mar 12, 2018. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29528243>

tobaccoinaustralia.org.au

# Tobacco in Australia

## Facts & Issues

---

Li, S, Wong, EM, Bui, M, Nguyen, TL, Joo, JE, Stone, J, Dite, GS, Giles, GG, Saffery, R, Southey, MC, Hopper, JL. Causal effect of smoking on DNA methylation in peripheral blood: a twin and family study. *Clin Epigenetics*. 2018 Feb 9;10:18. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/29456763>

Sung, YJ, Winkler, TW, de Las Fuentes, L, Bentley, AR, Brown, MR, Kraja, AT et al. A Large-Scale Multi-ancestry Genome-wide Study Accounting for Smoking Behavior Identifies Multiple Significant Loci for Blood Pressure. *Am J Hum Genet*. 2018 Mar 1;102(3):375-400. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/29455858>

Jhun, MA, Smith, JA, Ware, EB, Kardia, SLR, Mosley, TH, Turner, ST, Peyser, PA, Park, SK. Modeling the Causal Role of DNA Methylation in the Association Between Cigarette Smoking and Inflammation in African Americans: A 2-Step Epigenetic Mendelian Randomization Study. *Am J Epidemiol*. 2017 Nov 15;186(10):1149-1158. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29149250>

Lopez-Flores, LA, Perez-Rubio, G, Ramirez-Venegas, A, Ambrocio-Ortiz, E, Sansores, RH, Falfan-Valencia, R. Data on polymorphisms in CYP2A6 associated to risk and predispose to smoking related variables. *Data Brief*. 2017 Sep 13;15:86-91. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/28971126>

Willing, CM, Rong, J, Tanriverdi, K, Courchesne, PL, Huan, T, Wasserman, GA, Lin, H, Dupuis, J, Joehanes, R, Jones, MR, Chen, G, Benjamin, EJ, O'Connor, GT, Mizgerd, JP, Freedman, JE, Larson, MG, Levy, D. MicroRNA Signature of Cigarette Smoking and Evidence for a Putative Causal Role of MicroRNAs in Smoking-Related Inflammation and Target Organ Damage. *Circ Cardiovasc Genet*. 2017 Oct;10(5). pii: e001678. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29030400>

Wilson, R, Wahl, S, Pfeiffer, L, Ward-Caviness, CK, Kunze, S, Kretschmer, A, Reischl, E, Peters, A, Gieger, C, Waldenberger, M. The dynamics of smoking-related disturbed methylation: a two time-point study of methylation change in smokers, non-smokers and former smokers. *BMC Genomics*. 2017 Oct 18;18(1):805. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29047347>

Gao, X, Thomsen, H, Zhang, Y, Breitling, LP, Brenner, H. The impact of methylation quantitative trait loci (mQTLs) on active smoking-related DNA methylation changes. *Clin Epigenetics*. 2017 Aug 17;9:87. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/28824732>

tobaccoinaustralia.org.au

# Tobacco in Australia

## Facts & Issues

---

Dogan, MV, Beach, SRH, Philibert, RA. Genetically contextual effects of smoking on genome wide DNA methylation. *Am J Med Genet B Neuropsychiatr Genet*, 2017. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/28686328>

Lima, CF, Alves, MGO, Carvalho, Bfdc, de Lima, TA, Coutinho-Camillo, CM, Soares, FA, Scholz, J, Almeida, JD. Is DNA ploidy related to smoking? *J Oral Pathol Med*, 2017. Available from:

<https://www.ncbi.nlm.nih.gov/pubmed/28730665>

Mertens, TCJ, van der Does, AM, Kistemaker, LE, Ninaber, DK, Taube, C, Hiemstra, PS. Cigarette smoke differentially affects IL-13-induced gene expression in human airway epithelial cells. *Physiol Rep*. 2017 Jul;5(13). pii: e13347. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/28701525>

Boldry, EJ, Patel, YM, Kotapati, S, Esades, A, Park, SL, Tiirikainen, M, Stram, DO, Le Marchand, L, Tretyakova, N. Genetic Determinants of 1,3-Butadiene Metabolism and Detoxification in Three Populations of Smokers with Different Risks of Lung Cancer. *Cancer Epidemiol Biomarkers Prev*, 2017. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28292921>

de Carvalho, LSF. Smoking-epigenetics interaction: What do microRNAs tell us about susceptibility to atherosclerotic disease in smokers? *Atherosclerosis*. 2017 May 25. pii: S0021-9150(17)30219-8.

Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28592370>

Justice, AE, Winkler, TW, Feitosa, MF, Graff, M, Fisher, VA, Young, K, Barata, L, Deng, X et al. Genome-wide meta-analysis of 241,258 adults accounting for smoking behaviour identifies novel loci for obesity traits. *Nat Commun*. 2017 Apr 26;8:14977. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/28443625>

Zhao, J, Li, M, Chen, J, Wu, X, Ning, Q, Xu, Y et al. Smoking status and gene susceptibility play important roles in the development of chronic obstructive pulmonary disease and lung function decline: A population-based prospective study. *Medicine (Baltimore)*, 2017.96(25), e7283. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28356939>

Lim, GB. Genetics: Smoking reduces genetic protection against CHD. *Nat Rev Cardiol*. 2017 Jul;14(7):382. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28518177>

Otto, JM, Gizer, IR, Ellingson, JM, Wilhelmsen, KC. Genetic variation in the exome: Associations with alcohol and tobacco co-use. *Psychol Addict Behav*. 2017 May;31(3):354-366. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/28368157>

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# Tobacco in Australia

## Facts & Issues

---

Ou, WC, Huang, YC, Huang, CL, Lin, MH, Chen, YC, Chen, YJ, Liu, CN, Chen, MC, Huang, CS, Chen, PL. Interaction between cytochrome P450 2A6 and Catechol-O-Methyltransferase genes and their association with smoking risk in young men. Behav Brain Funct. 2017 May 4;13(1):8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28472995>

Peng, DD, Xie, W, Yu, ZX. Impact of interaction between CYP1A1 genetic polymorphisms and smoking on coronary artery disease in the Han of China. Clin Exp Hypertens. 2017;39(4):339-343. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28513235>

Wu, Q, Shi, Y, Ge, L, Ma, D, Zhang, H, Wang, J. Relationship of p73 gene polymorphism and additional gene-smoking and gene-obesity interaction with non-small cell lung cancer risk. Oncotarget. 2017 May 23;8(21):34423-34428. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28415779>

Yamamoto, Y, Kiyohara, C, Suetsugu-Ogata, S, Hamada, N, Nakanishi, Y. Biological interaction of cigarette smoking on the association between genetic polymorphisms involved in inflammation and the risk of lung cancer: A case-control study in Japan. Oncol Lett. 2017 May;13(5):3873-3881. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28529598>

Jhun, MA, Smith, JA, Ware, EB, Kardina, SLR, Mosley, TH, Turner, S et al. Modeling the Causal Role of DNA Methylation in the Association Between Cigarette Smoking and Inflammation in African Americans: A 2-Step Epigenetic Mendelian Randomization Study. Am J Epidemiol, 2017. 186(10), 1149-1158. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29149250>

Yang, W, Mao, S, Qu, B, Zhang, F, Xu, Z. Association of peroxisome proliferator-activated receptor delta and additional gene-smoking interaction on cardiovascular disease. Clin Exp Hypertens. 2017;39(2):114-118. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28287878>

Yoo, SS, Kang, HG, Choi, JE, Do, SK, Lee, WK, Choi, SH, Lee, SY, Lee, J, Cha, SI, Kim, CH et al. Effects of polymorphisms identified in genome-wide association studies of never-smoking females on the prognosis of non-small cell lung cancer. Cancer Genet. 2017 Apr;212-213:8-12. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28449811>

Zhang, H, Jin, L, Mu, T, Fan, Y, Zhu, Y, Mao, X, Li, R, Tang, S. Associations of CYP4A11 gene-gene and gene-smoking interactions with essential hypertension in the male eastern Chinese Han population. Clin Exp Hypertens. 2017 May 23:1-6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28534704>

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---

Zhang, L, Li, J, Hu, J, Li, D, Wang, X, Zhang, R, Zhang, H, Shi, M, Chen, H. Cigarette smoke extract induces EGFR-TKI resistance via promoting EGFR signaling pathway and ROS generation in NSCLC cell lines. *Lung Cancer*. 2017 Jul;109:109-116. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/28577939>

Zhao, J, Li, M, Chen, J, Wu, X, Ning, Q, Xu, Y, Xie, J, Yu, J. Smoking status and gene susceptibility play important roles in the development of chronic obstructive pulmonary disease and lung function decline: A population-based prospective study. *Medicine (Baltimore)*. 2017 Jun;96(25):e7283.

Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28640141>

Zhao, Y, Fu, D, Xu, C, Yang, J, Wang, Z. Identification of genes associated with tongue cancer in patients with a history of tobacco and/or alcohol use. *Oncol Lett*. 2017 Feb;13(2):629-638. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28356939>

Deng, X, Yuan, CH, Chang. Interactions between single nucleotide polymorphism of SERPINA1 gene and smoking in association with COPD: a case-control study. *Int J Chron Obstruct Pulmon Dis*. 2017 Jan 11;12:259-265. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28138235>

Akhuemonkhan, E, Lazo, M. Association between family history of diabetes and cardiovascular disease and lifestyle risk factors in the United States population: The 2009-2012 National Health and Nutrition Examination Survey. *Prev Med*. 2016 Dec 19. pii: S0091-7435(16)30420-0. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/28007493>

Vanni, I, Coco, S, Bonfiglio, S, Cittaro, D, Genova, C, Biello, F, Mora, M, Rossella, V, Dal Bello, MG, Truini, A, Banelli, B, Lazarevic, D, Alama, A, Rijavec, E, Barletta, G, Grossi, F. Whole exome sequencing of independent lung adenocarcinoma, lung squamous cell carcinoma, and malignant peritoneal mesothelioma: A case report. *Medicine (Baltimore)*. 2016 Nov;95(48):e5447. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27902597>

Gao, X, Mons, U, Zhang, Y, Breitling, LP, Brenner, H. DNA methylation changes in response to active smoking exposure are associated with leukocyte telomere length among older adults. *Eur J Epidemiol*, Nov 2016. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27832427>

Pfeifer, GP. How tobacco smoke changes the (epi)genome. *Science*. 2016 Nov 4;354(6312):549-550. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27811253>

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## Facts & Issues

---

Zhang, C, Lauderdale, DS, Pierce, BL. Sex-specific and time-varying associations between cigarette smoking and telomere length among older adults. *Am J Epidemiol*, 2016. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27856448>

Alves, MG, Carta, CF, de Barros, PP, Issa, JS, Nunes, FD, Almeida, JD. Repair genes expression profile of MLH1, MSH2 and ATM in the normal oral mucosa of chronic smokers. *Arch Oral Biol*. 2016 Sep 16;73:60-65. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27693945>

Joehanes, R, Just, AC, Marioni, RE, Pilling, LC, Reynolds, LM, Mandaviya, PR, Guan, W, Xu, T et al. Epigenetic signatures of cigarette smoking. *Circ Cardiovasc Genet*, 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27651444>

Chen, H, Yu, Z, Cao, Z, Lau, C. Probing cigarette smoke-induced DNA single-strand breaks and screening natural protective compounds by use of magnetic bead-based chemiluminescence. *Anal Bioanal Chem*, Oct 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27730260>

Costa, LA, da Silva, IC, Mariz, BA, da Silva, MB, Freitas-Ribeiro, GM, de Oliveira, NF. Influence of smoking on methylation and hydroxymethylation levels in global DNA and specific sites of KRT14, KRT19, MIR-9-3 and MIR-137 genes of oral mucosa. *Arch Oral Biol*. 2016 Dec;72:56-65. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27543926>

Lee, MK, Hong, Y, Kim, SY, London, SJ, Kim, WJ. DNA methylation and smoking in Korean adults: epigenome-wide association study. *Clin Epigenetics*. 2016 Sep 22;8:103. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27688819>

Sundar, IK, Rahman, I. Gene expression profiling of epigenetic chromatin modification enzymes and histone marks by cigarette smoke: Implications for COPD and lung cancer. *Am J Physiol Lung Cell Mol Physiol*, Oct 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27793800>

Huan, T, Joehanes, R, Schurmann, C, Schramm, K, Pilling, LC, Peters, MJ, Magi, R, DeMeo, D, O'Connor, G T, Ferrucci, L, Teumer, A, Homuth, G, Biffar, R, Volker, U, Herder, C, Waldenberger, M et al. A whole-blood transcriptome meta-analysis identifies gene expression signatures of cigarette smoking. *Hum Mol Genet*, 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27577875>

Joehanes, R, Just, AC, Marioni, RE, Pilling, LC, Reynolds, LM, Mandaviya, PR, Guan, W, Xu, T et al. Epigenetic signatures of cigarette smoking. *Circ Cardiovasc Genet*, 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27651444>

tobaccoinaustralia.org.au

# Tobacco in Australia

## Facts & Issues

---

Olfson, E, Hartz, S, Carere, DA, Green, RC, Roberts, JS, Bierut, LJ, Group, P. Gen Study. Implications of personal genomic testing for health behaviors: the case of smoking. *Nicotine Tob Res*, 2016.

Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27613923>

Richmond-Rakerd, LS, Otto, JM, Slutske, WS, Ehlers, CL, Wilhelmsen, KC, Gizer, IR. A novel tobacco use phenotype suggests the 15q25 and 19q13 loci may be differentially associated with cigarettes per day and tobacco-related problems. *Nicotine Tob Res*, 2016. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/27663783>

Emma, R, Caruso, M, Polosa, R. Smoking history can influence the epigenetic and gene expression profile. *Am J Physiol Lung Cell Mol Physiol*. 2016 Aug 1;311(2):L525. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/27507815>

Sung, YJ, Winkler, TW, Manning, AK, Aschard, H, Gudnason, V, Harris, TB, Smith, AV et al. An Empirical Comparison of Joint and Stratified Frameworks for Studying G x E Interactions: Systolic Blood Pressure and Smoking in the CHARGE Gene-Lifestyle Interactions Working Group. *Genet Epidemiol*, 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27230302>

Cao, C, Chen, J, Lyu, C, Yu, J, Zhao, W, Wang, Y, Zou, D. Correction: bioinformatics analysis of the effects of tobacco smoke on gene expression. *PLoS One*, 2016;11(3):e0150778. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/26934050>

Ambatipudi, S et al. Tobacco smoking-associated genome-wide DNA methylation changes in the EPIC study. *Epigenomics*, 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26864933>

Klebaner, D et al. X chromosome-wide analysis identifies DNA methylation sites influenced by cigarette smoking. *Clin Epigenetics*, 2016. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/26913089>

Ellegaard, PK, Poulsen, HE. Tobacco smoking and oxidative stress to DNA: a meta-analysis of studies using chromatographic and immunological methods. *Scand J Clin Lab Invest*, 2016. 1-8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26767849>

Zhang, Y et al. Self-reported smoking, serum cotinine, and blood DNA methylation. *Environ Res*, Apr 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26826776>

Kupiainen, H et al. CHRNA5/CHRNA3 locus associates with increased mortality among smokers. *COPD*, 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26751916>

tobaccoinaustralia.org.au

# Tobacco in Australia

## Facts & Issues

---

Taylor, JY et al. A Genome-wide study of blood pressure in African Americans accounting for gene-smoking interaction. *Sci Rep*, 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26752167>

Vanni, I, Coco, S, Bonfiglio, S, Cittaro, D, Genova, C, Biello, F et al. Whole exome sequencing of independent lung adenocarcinoma, lung squamous cell carcinoma, and malignant peritoneal mesothelioma: A case report. *Medicine (Baltimore)*, 2016. 95(48), e5447. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27902597>

Tilley, AE et al. Cigarette smoking induces changes in airway epithelial expression of genes associated with monogenic lung disorders. Cigarette smoking induces changes in airway epithelial expression of genes associated with monogenic lung disorders. *Am J Respir Crit Care Med*, 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26771416>

Zhao, RJ et al. Probing the Serotonin transporter availability among male cigarette smokers: A SPECT study with [123I] ADAM. *J Addict Med*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26742023>

Zhu, X et al. Genome-wide analysis of DNA methylation and cigarette smoking in Chinese. *Environ Health Perspect*, 2016. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26756918>

de Melo, LG et al. Genetic polymorphisms by deletion in genes that encode for glutathione S-transferases are associated with nicotine dependence and tobacco use-related medical disorders. *Neuro Endocrinol Lett*, Dec 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26812289>

Ganapathy, V et al. Detection of In Vivo DNA Damage Induced by Very Low Doses of Mainstream and Sidestream Smoke Extracts Using a Novel Assay. *J Okla State Med Assoc*, Nov 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26817069>

Cao, C et al. Bioinformatics analysis of the effects of tobacco smoke on gene expression. *PLoS One*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26629988>

Hallden, S et al. Gene variance in the nicotinic receptor cluster (CHRNA5-CHRNA3-CHRNA4) predicts death from cardiopulmonary disease and cancer in smokers. *J Intern Med*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26689306>

Qiu, W. The impact of genetic variation and cigarette smoke on DNA methylation in current and former smokers from the COPD Gene study. *Epigenetics*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26646902>

tobaccoinaustralia.org.au

# Tobacco in Australia

## Facts & Issues

---

Cannon, DS et al. CYP2A6 effects on subjective reactions to initial smoking attempt. *Nicotine Tob Res*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26541911>

Vink, JM et al. Differential gene expression patterns between smokers and non-smokers: cause or consequence? *Addict Biol*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26594007>

Wang, J et al. Association of A118G polymorphism in the mu-opioid receptor gene with smoking behaviors: a meta-analysis. *J Toxicol Sci*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26558451>

Gao, X et al. DNA methylation changes of whole blood cells in response to active smoking exposure in adults: a systematic review of DNA methylation studies. *Clin Epigenetics*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26478754>

Wain, LV et al. Novel insights into the genetics of smoking behaviour, lung function, and chronic obstructive pulmonary disease (UK BiLEVE): a genetic association study in UK Biobank. *Lancet Respir Med*, Oct 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26423011>

Li, H et al. Association of 5-HTTLPR polymorphism with smoking behaviors: A meta-analysis. *Physiol Behav*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26363418>

Philibert, R, Erwin, C. A review of epigenetic markers of tobacco and alcohol consumption. *Behav Sci Law*, Oct 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26365064>

Allione, A et al. Novel epigenetic changes unveiled by monozygotic twins discordant for smoking habits. *PLoS One*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26043106>

Treur, JL et al. Spousal resemblance for smoking: Underlying mechanisms and effects of cohort and age. *Drug and Alcohol Dependence*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26051161>

Yang, X et al. Association between monoamine oxidase gene polymorphisms and smoking behavior: A meta-analysis. *Drug and Alcohol Dependence*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26051160>

Jensen, KP et al. A CHRNA5 smoking risk variant decreases the aversive effects of nicotine in humans. *Neuropsychopharmacology*, 2015. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25948103>

tobaccoinaustralia.org.au

# Tobacco in Australia

## Facts & Issues

---

O'Brien, ME et al. The impact of smoke exposure on the clinical phenotype of alpha-1 antitrypsin deficiency in Ireland: exploiting a national registry to understand a rare disease. COPD, 2015.

Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25938284>

Basson, J et al. Influence of smoking status and intensity on discovery of blood pressure loci through gene-smoking interactions. Genetic Epidemiology, 2015. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/25940791>

Guida F, Sandanger TM, Castagne R, Campanella G, Polidoro S, et al. Dynamics of smoking-induced genome-wide methylation changes with time since smoking cessation. Hum Mol Genet, 2015.

Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25556184>

Chen, LS et al. CHRNA5 risk variant predicts delayed smoking cessation and earlier lung cancer diagnosis- A meta-analysis. Journal of the National Cancer Institute, 2015. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/25873736>

De Oliveira, SR et al. DNA methylation analysis of cancer-related genes in oral epithelial cells of healthy smokers. Archives of oral biology, 2015. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/25791328>

Eom, SY et al. Interactions between paraoxonase 1 genetic polymorphisms and smoking and their effects on oxidative stress and lung cancer risk in a Korean population. PLoS One, 2015. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/25741997>

Ottini, L et al. Gene promoter methylation and DNA repair capacity in monozygotic twins with discordant smoking habits. Mutation research. Genetic toxicology and environmental mutagenesis, 2015. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/25813726>

Pan, L et al. Association of CYP2A6 gene polymorphisms with cigarette consumption: A meta-analysis. Drug and Alcohol Dependence, 2015. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/25683822>

Semmler, A. et al. Alcohol abuse and cigarette smoking are associated with global DNA hypermethylation: Results from the German Investigation on Neurobiology in Alcoholism (GINA). Alcohol, 2015. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/25702197>

Burki TK. Smoking and mosaic Y chromosome loss. Lancet Oncol, 2014. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/25524797>

tobaccoinaustralia.org.au

# Tobacco in Australia

## Facts & Issues

---

Nicole, W. Building a solid case: cigarette smoking and epigenomic alterations. *Environ Health Perspect*, 2014. 122(7), A194. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24984253>

Bushueva O, Solodilova M, Churnosov M, Ivanov V, and Polonikov A. The Flavin-Containing Monooxygenase 3 Gene and Essential Hypertension: The Joint Effect of Polymorphism E158K and Cigarette Smoking on Disease Susceptibility. *Int J Hypertens*, 2014; 2014:712169. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25243081>

Abdul-Ghani, R, Qazzaz, M, Dabdoub, N, Muhammad, R, Abdul-Ghani, A. Studies on cigarette smoke induced oxidative DNA damage and reduced spermatogenesis in rats. *J Environ Biol*, 2014. 35(5), 943-947. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25204071>

Barrett, JR. A smoking gun? Epigenetic markers of tobacco use history. *Environ Health Perspect*, 2014. 122(2), A56. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24486792>

Bloom, AJ, Hartz, SM, Baker, TB, Chen, LS, Piper, ME, Fox, L et al. Beyond cigarettes per day. A genome-wide association study of the biomarker carbon monoxide. *Ann Am Thorac Soc*, 11(7), 1003-1010. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25072098>

De Bantel A, Fleury-Feith J, Poirot C, Berthaut I, Garcin C, et al. Simultaneous vitality and DNA-fragmentation measurement in spermatozoa of smokers and non-smokers. *Cytometry B Clin Cytom*, 2014. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25220539>

Guttikonda VR, Patil R, and Kumar G. DNA damage in peripheral blood leukocytes in tobacco users. *J Oral Maxillofac Pathol*, 2014; 18(Suppl 1):S16-20. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25364170>

Kreiner-Moller E, Strachan DP, Linneberg A, Husemoen LL, Bisgaard H, et al. 17q21 gene variation is not associated with asthma or susceptibility to smoking in adult populations. *Allergy*, 2014. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25331618>

Paul S and Amundson SA. Differential Effect of Active Smoking on Gene Expression in Male and Female Smokers. *J Carcinog Mutagen*, 2014; 5. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25621181>

Lutz SM and Hokanson JE. Genetic influences on smoking and clinical disease. Understanding behavioral and biological pathways with mediation analysis. *Ann Am Thorac Soc*, 2014; 11(7):1082-3. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25237988>

tobaccoinaustralia.org.au



# Tobacco in Australia

## Facts & Issues

Huzen, J, Wong, LS, van Veldhuisen, DJ, Samani, NJ, Zwinderman, AH, Codd, V et al. Telomere length loss due to smoking and metabolic traits. *J Intern Med*, 2014. 275(2), 155-163. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24118582>

Ghorbanihaghjo, A, Safa, J, Alizadeh, S, Argani, H, Rashtchizadeh, N, Taghinia, MV, Abbasi, MM. Protective effect of fish oil supplementation on DNA damage induced by cigarette smoking. *J Health Popul Nutr*, 2013. 31(3), 343-349. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24288948>

Youngblom, E, Pariani, M, Knowles, JW. (1993). Familial Hypercholesterolemia. RA Pagon, MP Adam, HH Ardinger, SE Wallace, A Amemiya, LJB Bean, TD Bird, N Ledbetter, HC Mefford, RJH Smith, K Stephens (Eds.), *GeneReviews*(R). Seattle (WA), 1993. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24404629>

### News reports:

Shrine, N, Guyatt, AL, Erzurumluoglu, AM, Jackson, VE, Hobbs, BD, Melbourne, CA et al. New genetic signals for lung function highlight pathways and chronic obstructive pulmonary disease associations across multiple ancestries. *Nature Genetics*, 2019. Available from: <https://doi.org/10.1038/s41588-018-0321-7>

National Heart Lung and Blood Institute. Researchers use cigarette smoking behavior to identify genes that regulate blood pressure. *Medical Xpress*, 2018. Mar 5, 2018. Available from: <https://medicalxpress.com/news/2018-03-cigarette-behavior-genes-blood-pressure.html>

No authors listed. Cigarette Smoking alters Epigenetics. *WorldHealth.net* ( American Academy of Anti-Aging), 2017. Oct 20, 2017. Available from: <https://www.worldhealth.net/news/cigarette-smoking-alters-epigenetics/>

Alexandrov, LB, Ju, YS, Haase, K, Van Loo, P, Martincorena, I, Nik-Zainal, S, Totoki, Y, Fujimoto, A, Nakagawa, H, Shibata, T, Campbell, PJ, Vineis, P, Phillips, DH and Stratton, MR. Mutational signatures associated with tobacco smoking in human cancer. *Science*. 2016 Nov 4;354(6312):618-622. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27811275>

Sample, Ian. DNA study lays bare devastating damage caused by smoking. *The Guardian*, 2016. Nov 3, 2016. Available from: <https://www.theguardian.com/society/2016/nov/03/dna-study-lays-bare-devastating-damage-caused-by-smoking>

tobaccoinaustralia.org.au

# Tobacco in Australia

## Facts & Issues

---

Watson, Amy. Ageing gene linked to 'smoking, diet and exercise'. The Scotsman, 2015. Oct 26, 2015. Available from: <http://www.scotsman.com/news/health/ageing-gene-linked-to-smoking-diet-and-exercise-1-3928397#axzz3pl8XtzJd>

No authors listed. Gene variant linked to smoking longer, getting lung cancer sooner. Medical News Today, 2015. Apr 16, 2015. Available from: <http://www.medicalnewstoday.com/releases/292439.php?tw>

tobaccoinaustralia.org.au