

Wildfire Pollution – Lung Drainage Protocol

Many parts of Canada and the US are experiencing persistent, significant air quality problems. I have been getting so many questions on what we can be doing to protect ourselves and detoxify our lungs. I'll start by talking about the biology behind what is going on in the lungs and then I'll get into specific tools for thinning mucous, bringing mucous up out of the lungs, enhancing epithelial production of lysosomal enzymes, detoxifying pollutants and other useful approaches.

The lungs are a hollow space lined with epithelia, just like our gut, sinuses and vaginal tract. In the special situation involving inhalation of pollutants (such as PM2.5 and others), the body's normal response will involve some amount of mucous production generated to mechanically expel the airborne particulates. Inflamed or damaged pulmonary epithelia make TSLP, IL-25, and IL-33. These cytokines drive the activation of innate lymphoid cells type 2 (ILC2's) and also drive Th2 polarization. Both the ILC2's and the Th2 cells make IL-4, IL-5, and IL-13. The IL-13 drives mucous production (some amount of which we want) and can also drive basement membrane thickening (which we don't want). (Hong, et al, Allergy, 2020)

So, in the case of inhaling carbon or other forms of airborne particulate matter from residual wildfire smoke, it's appropriate to have some amount of Th2/ILC2 response, to produce mucous to protect the epithelia and also form a mechanism for expelling the inhaled particles. However, for individuals who are already Th2 dominant, it's likely they'll get into more trouble, since they're likely to over-react to the pollutants, yielding too much mucous, too much histamine, and in some cases too many eosinophils. These individuals will need some inhibition of the Th2 response, typically by inhibiting IL-4 with a [perilla supplement](#) and GATA3 with [astragalus](#) or oxymatrine.

For people exposed to increased pulmonary particulate matter, it's also crucial that their vitamin D levels are strong. Interestingly, IL-13 drives vitamin D dependent expression of cathelicidin (a lysosomal enzyme) in bronchial epithelia. (Schrumpf, Infect Immun., 2012) This suggests that when the IL-13 level starts to ramp up in order to make the mucous to drive particulate matter out of the lungs, the higher IL-13 levels also induce the bronchial epithelia to make cathelicidin, which diminishes the risk of pulmonary infection. But the process requires vitamin D. If the person's D level is too low at baseline, cathelicidin production may be blunted, leaving the person more vulnerable to infection. A recent paper also demonstrated that adequate vitamin D status correlated with and predicted reduced inflammatory impact from ozone exposure. (Perryman, PLoS One, 2023)

For people with Epstein Barr Virus (EBV) background elevation, there is a concern that EBV downregulates vitamin D receptor (VDR) function. (Yenamandra, Cell Mol Life Sci., 2010) This suggests that those who have a background elevation of EBV may have a suboptimal vitamin D response, even if their D levels are within the normal range. They may need vitamin D levels to be close to the top of the range, to offset the blunting effect of suboptimal VDR function. Combined with the paper on IL-13 driving vitamin D dependent expression of cathelicidin, this would suggest that those with low

D or those with chronic EBV, or both, would be more likely to get a pulmonary infection when their IL-13 levels ramp up.

Individuals who have been chronically exposed to airborne pollutants may need support for the clearance of pollutant metabolites. Sulforaphane, Glutathione and homeopathic drainage is highly recommended to clear out and drain the lungs (see below for full protocol).

Supplements to consider taking for the pollution:

- [Vitamin A](#) (dose to get levels near top of range) and Sunbutyrate (1 tsp 2x/day) – these will help inhibit IL-13.
- [Perilla](#) can help to downregulate the Th2 system overall. IL-4 is the autocrine loop cytokine that drives the Th2 system, so inhibiting IL-4 is essential. This is also done with perilla extract. 500mg 3x/day or more is often useful.
- [Astragalus](#): GATA3 is the gene target of IL-4, so downregulating GATA3 with astragalus 4-500mg 3x/day or oxymatrine 4-500mg 2x/day is also often useful.
- [NAC](#): NAC is known to break disulfide bonds, so it's very useful in breaking down thick mucous. Some individuals who have fibrosis shouldn't do NAC but instead should be doing glutathione.
- Horny goat weed (epimedium) or Lobelia tea: Moving mucous up out of the lungs: Epimedium, also known as horny goat weed, promotes the activity of the muco-ciliary escalator, which moves mucous up out of the lungs. Start with 500mg 2x/day. Dose to need.
- [Pure Encaps Th1 Support](#): Th1 response to offset the Th2 dominance created by the lung irritation and it has the baicalin and sulforaphane for epithelial repair and detox of airborne pollutants
- [Vitamin D](#) – This becomes especially important in patients with autoimmune disease, as vitamin D is known to downregulate autoimmune expression.
- UNDA Corylus Avellana Gemmo (lung drainage): 40 drops 2-3x/day in a bit of water sublingually. Take 15 mins before food/scents/flavours.
- UNDA pyrogenium plex (expell mucous): 10 drops 2-3x/day sublingually (with a bit of water), hold under tongue for 30s before swallowing. take 15 mins before food/scents/flavours
- UNDA Gammadyne Mg (lung support) – 1 ampoule daily sublingually 15 mins away from food/scents/flavours.
- Pure Encapsulations Liposomal glutathione (lung repairant/detoxifier) – 400mg/day

Always check with your practitioner or doctor before supplementing!

The Research

- *Role of IL-25, IL-33, and TSLP in triggering united airway diseases toward type 2 inflammation*
Allergy. 2020 Nov;75(11):2794-2804. Hong H, et al.
- *Interleukin 13 exposure enhances vitamin D-mediated expression of the human cathelicidin antimicrobial peptide 18/LL-37 in bronchial epithelial cells*
Infect Immun. 2012 Dec;80(12):4485-94. Schrumpf JA, et al.
- *Plasma sterols and vitamin D are correlates and predictors of ozone-induced inflammation in the lung: A pilot study*
PLoS One. 2023 May 15;18(5):e0285721. Perryman AN, et al.

- *Epstein-Barr virus encoded EBNA-3 binds to vitamin D receptor and blocks activation of its target genes*
Cell Mol Life Sci. 2010 Dec;67(24):4249-56. Yenamandra SP, et al.
- *Rapid and sustainable detoxication of airborne pollutants by broccoli sprout beverage: results of a randomized clinical trial in China.* *Cancer Prev Res (Phila).* 2014 Aug;7(8):813-823. Egner PA, et al.
- *A proof-of-concept clinical study examining the NRF2 activator sulforaphane against neutrophilic airway inflammation*
Respir Res. 2016 Jul 22;17(1):89. Duran CG, et al.