



In his Teach-in, *A Conversation About COVID-19*, Dr. Samuel Yanuck shared with us his top-of-mind thoughts for practitioners around supporting the immune system amid the spread of COVID-19. While acknowledging that interventions are speculative in these early stages, Dr. Yanuck is able to use his understanding of the inner workings of the immune system, plus early data from outbreak areas to give us clues as to how we should direct our thinking. Below you will find a summary of Dr. Yanuck's current thinking around his intervention approach.

Steps: **Note that glutathione and NAC are useful features at every step. Consider giving both.*

1. Support Th1 response and NK cell response. Goal is support for efficiency of immune surveillance. The interferon gamma will also help to quiet down Th17 effector cytokine production (IL-6, IL-17 a and f, IL-21, IL-22). Th17 cells and cytokines have a useful function, but their overproduction can drive excessive inflammatory activation that becomes problematic.
Th1 response: Berberine, Baicalin, Echinacea, Goldenseal, Glutathione, vitamin A
NK cell response: astragalus, andrographis, reishi, C
2. Contemporaneous with #1: Inhibition of over-active Th2 response: Perilla to dampen excessive IL-4. Astragalus to dampen GATA-3. NAC and quercetin to dampen histamine. Vitamin C to dampen histamine.
3. Reduce inflammation: curcumin, resveratrol, D, A, E, glutathione

Labs – The clinician is trying to understand the balance of inflammation (hsCRP, GlycA, ferritin, other acute phase reactants) and tolerogenic / suppressive effects driven by transforming growth factor beta (TGFβ). The other key piece there is glutathione (GSH) is in a reciprocal relationship with TGFβ. TGFβ pours our ROS that deplete GSH. GSH is essential to lung function.

NOTE: This is a document for clinicians. Dose listings should be superseded by clinician judgement. Dose is also affected by supplement quality, concentration of active ingredients, and other factors. When possible, dosing should be based on lab results, as with for example vitamin D, vitamin A, etc.

Substance	Dose	Surveillance	Anti-inflammatory	Fibrosis	Normal 2 Body	Lab Testable	Double Win	Priority
Glutathione	400mg bid/tid	↑ Th1	↓ Mac inflam. / ↓ ROS	↓ ROS / ↓TGFβ	Yes	Yes	Yes	1
Berberine	500mg bid/tid	↑ Th1	↑ IFNγ → ↓Th17 effector cytokines / ↑ AMPK → ↑ SIRT2 → ↓ Inflammasome	↓MDSC's → ↓TGFβ			Yes	2
Baicalin	300mg bid/tid	↑Th1	↓IL-6 → ↓Th17 / ↑IFNγ → ↓Th17 effector cytokines	↓MDSC's → ↓TGFβ			Yes	2
Echinacea		↑Th1	↑IFNγ → ↓Th17 cytokines	↓MDSC's → ↓TGFβ			Yes	2a
Goldenseal		↑Th1	↑IFNγ → ↓Th17 cytokines	↓MDSC's → ↓TGFβ			Yes	2a
Astragalus	500mg bid/tid	↑NK Cells	↑IFNγ → ↓Th17 cytokines				Yes	Pick 2. Priority 1
Andrographis	400mg bid/tid	↑NK Cells	↑IFNγ → ↓Th17 cytokines				Yes	
Reishi	400mg bid/tid	↑NK Cells	↑IFNγ → ↓Th17 cytokines				Yes	
Vitamin C	3-5mg/day	↑NK Cells	↑IFNγ → ↓Th17 cytokines		Yes	Yes	Yes	2
Perilla	300mg bid/tid	↓ IL-4 / Th2	↓Th2 → ↓Mast Cell Activation & ↑Th1				Yes	2 if needed
Vitamin D	10,000 iu qd	↑ Mac lyso. enzymes	↑NFkB, ↓CRP, ↓MMP9, ↓TIMP-1		Yes	Yes	Yes	1
Vitamin A	10,000 iu qd	↑Th1 & other	↑IFNγ → ↓Th17 cytokines		Yes	Yes	Yes	1 if needed
Quercetin	500mg bid/tid	↓ Histamine	↓Mast Cells / histamine					2 if needed
NAC	900mg bid / tid	↑GSH / ↓ Histamine	↓ mucous / ↑ GSH → ↓ mac inflammation	↓ ROS / ↓TGFβ	Yes		Yes	1
Curcumin	4-500mg bid/tid ↑ as needed	↓NFkB → ↓MDSC's	↓NFkB & ↓STAT3	↓MDSC's → ↓TGFβ			Yes	3
Resveratrol	200mg bid/tid ↑ as needed	↓NFkB → ↓MDSC's	↓NFkB & ↓STAT3	↓MDSC's → ↓TGFβ			Yes	3
Zinc	30mg bid/tid	Intracellular antiviral			Yes	Yes		1

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