

Based on the document pubmed-covidrepro-set - Copy.nbib.txt, here is the comprehensive list of all herbs, natural substances, compounds, and metabolites mentioned, categorized by their type:

1. Natural Compounds & Immunomodulators

- **Melatonin:** Identified for its "antioxidative and anti-inflammatory reprogramming" effects, helping to preserve homeostasis and potentially treating COVID-19.¹¹¹¹
- **Beta-Glucan:** A polysaccharide mentioned as an "immune training agent" (along with BCG and LPS) to train innate immune cells like monocytes and NK cells.²
- **Chitosan:** A natural polysaccharide (derived from chitin) mentioned in the context of drug delivery systems and nanoparticles.³³³³
- **Itaconate:** A metabolite with antiviral and immunomodulatory potential; low levels correlate with COVID-19 severity.⁴
- **Alpha-Ketoglutarate:** A metabolite involved in sensing platforms that stabilize HIF-1\$\\alpha\$ and resolve metabolic dysregulation.⁵
- **Dimethyloxalylglycine:** A cell-permeable derivative of alpha-ketoglutarate that affects host metabolism and glycolysis.⁶

2. Amino Acids & Derivatives

- **Tryptophan:** An amino acid whose metabolism is altered in leukemia and COVID-19; associated with metabolic reprogramming.⁷⁷⁷⁷
- **Arginine:** An amino acid that is reprogrammed during COVID-19 infection.⁸⁸⁸⁸
- **Glutamine:** Mentioned in the context of altered metabolism and "glutaminolysis" in SARS-CoV-2 infection.⁹⁹⁹⁹
- **Glutathione:** A key antioxidant produced to maintain redox balance; its metabolism is dysregulated in infection.¹⁰¹⁰¹⁰
- **Indoxyl Sulfate:** A uremic toxin/metabolite found elevated in severe COVID-19 patients, linked to monocyte apoptosis and TNF-\$\\alpha\$ production.¹¹¹¹¹¹¹¹
- **5-Methoxyindoleacetate:** A metabolite differentially expressed in leukemia bone marrow.¹²

- **Polyamine:** A class of compounds whose synthesis is dysregulated in host response to SARS-CoV-2.¹³

3. Lipids & Fatty Acids

- **Ketone Bodies (including β -hydroxybutyrate / BHB):** Produced during ketogenesis (fasting/ketogenic diet); BHB acts as an alternative carbon source to fuel T cells and restore oxidative phosphorylation.¹⁴¹⁴¹⁴¹⁴
- **Arachidonic Acid:** A fatty acid involved in inflammatory pathways; significantly upregulated following vaccination in some populations.¹⁵
- **Leukotriene B4:** A pro-inflammatory lipid mediator derived from arachidonic acid.¹⁶
- **Prostaglandin E2:** A pro-inflammatory lipid mediator derived from arachidonic acid.¹⁷
- **Fatty Acids:** General category mentioned as being reprogrammed during infection.
181818181818
- **Cholesterol:** Metabolism is broadly involved in the viral lifecycle and reprogrammed during infection.¹⁹¹⁹¹⁹¹⁹¹⁹¹⁹
- **Butanoate:** A short-chain fatty acid metabolite.²⁰
- **Phosphorylcholine:** A lipid metabolite mentioned in leukemic bone marrow profiling.²¹

4. Vitamins & Cofactors

- **Tetrahydrofolic Acid:** A derivative of Folic Acid (Vitamin B9) noted in metabolomic profiling.²²

5. Minerals

- **Calcium:** Involved in signaling pathways from damaged lysosomes that induce stress granules.²³²³²³²³

6. Macronutrients & Metabolic Fuels

- **Glucose:** Dysregulated in infection; elevated blood glucose supports viral replication and

is a key marker of metabolic reprogramming (glycolysis).

- **Heme:** Metabolism altered in leukemia samples. ²⁵

7. Drugs & Other Agents (Mentioned in context of reprogramming)

- **Metformin:** An "immunometabolic modulator" (historically plant-derived) used to target metabolic reprogramming.²⁶
 - **Fluoxetine:** An SSRI antidepressant shown to increase circulating IL-10 and protect against sepsis-induced hypertriglyceridemia.²⁷²⁷²⁷²⁷
 - **Celecoxib:** An anti-inflammatory drug mentioned in the context of macrophage metabolism.²⁸²⁸²⁸²⁸
 - **Vedolizumab:** A monoclonal antibody used to prevent graft-versus-host disease (GVHD).²⁹
 - **SPIKENET (SPK):** A therapeutic agent evaluated for its efficacy in treating long-term renal transcriptomic changes.³⁰³⁰³⁰³⁰
 - **Lipopolysaccharide (LPS):** Bacterial endotoxin used as an immune training agent.³¹
 - **BCG (Bacillus Calmette-Guérin):** Bacterial vaccine strain used for immune training.³²