



Immunity

E-newsletter, March 2022

Kangcare Bioindustry Co.,Ltd

Background and Significance:

Immunity, we can define it as the body's ability to recognize and resist foreign invaders. All diseases are related to immunity, without immunity, people can not live for several days, can not emphasize the importance of human immunity too much.

The human body has a strong immunity, which is the key to resist the virus. In the current COVID-19 outbreak, for everyone, only through the strict protection of their own immunity, can reduce the damage of the virus.



Kangcare focuses on immune research and modulates immunity through the following three mechanisms of action:

(1) Increase macrophage activity;

Macrophages are important immune cells that regulate inflammation and host defense by secreting proinflammatory cytokines, chemokines, NO, PGE₂, and the expression of inflammatory proteins. Macrophages secrete NO and cytokines to increase the activity, and increase the amount of lysozyme secretion of macrophages to increase the activity of macrophages.

*BRM activates immune cells T,B,NK, macrophages, etc. :

Glucosaccharide biological immune response modulator (BRM) activates the immune response by binding to the pattern recognition receptor (PPR) on the surface of immune cells such as macrophages. Most BRM is β -glucan, and BRM binds to the polysaccharide receptor on the surface of macrophages to activate the cellular signal transduction pathway. Increase the secretion of cytokines such as INTERleukin-1 (IL-1), α -tumor necrosis factor (TNF- α), γ -interferon (IFN- γ) and NO. These immunoactive factors act as endogenous signals of intercellular interactions and induce the production of other cytokines secondary. Like IL-2, IL-6, IL-8, IL-12 and Ig-G, they play a regulatory role in the immune response of the body. IL-1 and IL-2 can promote the reproduction of T cells, promote the production of antibodies by B cells, and enhance the killing function of CTL and NK cells. TNF- α and IFN- γ have a direct cytotoxic effect and growth inhibition on tumor cells. NO has strong killing effect on tumor cells and microbial pathogens.

(2) Regulate Th1/Th2 (helper T cell) balance;

As both Th1 cells and Th2 cells can secrete cytokines to promote their own increment and the increment of each other, Th1 cells and Th2 cells are in a relatively balanced state in the collective under normal circumstances. But when the body functions abnormally, it often shows a balance in favor of one side, known as "Th1/Th2 drift." Once the balance between Th1 cells and Th2 cells is broken, it is likely that the dynamic balance of the cytokine network in human body will be broken, which will lead to the emergence and development of many diseases. Many studies are directed towards discovering and developing drugs and methods that can reverse or stabilize the Th1/Th2 balance.



(3) Calcium ions helps activate T cells;

Calcium ions change the function of lipid molecules, which helps T cells activate and increase their sensitivity to foreign antigens, helping the body to eliminate pathogens. After T cell activation, calcium channels on the cell surface automatically open, resulting in increased intracellular calcium concentration, which lasts for several hours. Calcium ion can bidirectional regulation of T cell function, such as the immune function of T cells infiltrated by tumor tissue, can promote the recovery of T cell function, and for example, in organ transplantation rejection, autoimmune disease attack, can also inhibit their overreaction.

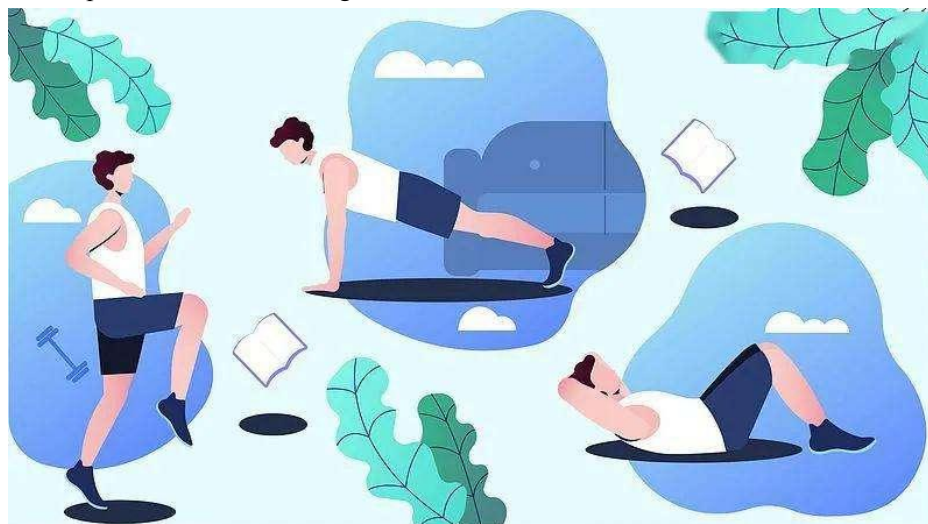
Recommend the raw materials:

1) L-Glutathione

L-Glutathione has two immune mechanisms, one is to regulate the activity of neutrophils and dendritic cells, and the other is to regulate the proliferation and activity of T cells. GSH level controls Th1/Th2 balance by regulating the cytokine pattern and the cellular environment of antigen-presenting cells. GSH depletion leads to a preponderant Th2 response that inhibits CD8+ and cytotoxic lymphocyte function and activates CD4+ and T lymphocytes, leading to inflammatory/immune-mediated disease. Changes in intracellular levels of GSH and shifts in Th1/Th2 balance have been associated with a variety of inflammatory diseases and immune disorders, including rheumatoid arthritis, autoimmune thyroiditis, Amyotrophic lateral sclerosis, AIDS, Alzheimer's disease, alcoholic liver disease, cataracts, and acute respiratory distress syndrome.

2) Yeast β -glucan

Yeast β -glucan can activate macrophages by binding with macrophages. In addition, it can activate T lymphocytes, B lymphocytes, macrophages, natural killer cells (NK) and other immune enhancers. It also secretes cytokines that activate immune cells; It can also activate neutrophils and phagocytes in gastrointestinal tissues, further activate and influence the "immune-neuro-endocrine" regulatory network, enhance its anti-infection, anti-stress and cellular adaptive protection ability, at the same time, it also has adsorption, mycotoxin elimination, anti-radiation, promote wound healing and other functions.



3) Inulin

Inulin can selectively promote the growth and metabolism of intestinal beneficial bacteria, inhibit the growth of harmful bacteria, adjusting intestinal flora balance, can increase antioxidant enzymes and glutathione S-transferase gene expression, can increase the expression of calcium binding protein, promote the absorption of calcium, promote the proliferation of intestinal cells, thus increase the intestinal absorption surface area.

4) L-theanine

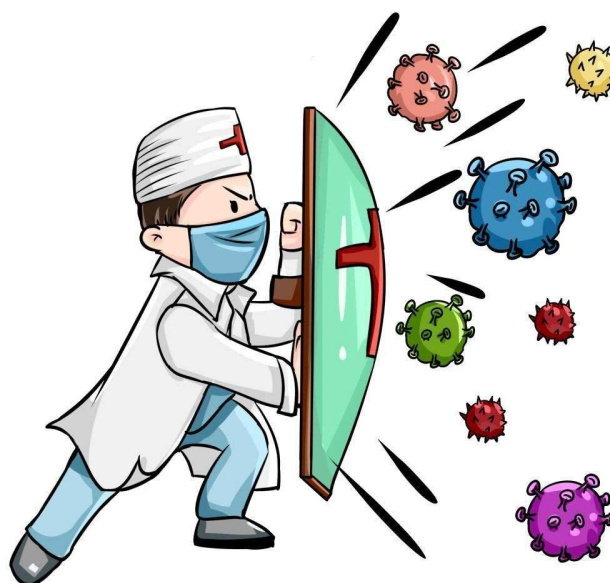
L-theanine can enhance immunity through the following three mechanisms: One, it can significantly increase the content of IL-2 and IFN - γ in serum and enhance the resistance to disease; Two, it can activate $\gamma\delta$ T cells, and secrete interferon - γ (IFN - γ) and tumor necrosis factor - α (TNF - α), killing the infected cells and presenting antigen to $\alpha\beta$ T cells, assist B cells to produce antibodies, improve the immune capacity of the body; Three, single or combined use of L-theanine and cystine can promote the synthesis of GSH in immune cells, enhance antioxidant capacity and improve immune function.

5) Foodborne bioactive peptide:

The immunomodulatory activity of foodborne protein peptides is related to the amino acid composition, sequence, length, charge, hydrophobicity and molecular structure of the peptides. Studies have shown that protein peptides with hydrophobic amino acids, glutamine, glutamic acid, tyrosine, tryptophan, cysteine, asparagine and aspartic acid residues have strong immunomodulatory activities. The immunomodulatory functions and anti-inflammatory effects of food-borne protein peptides are closely related to the positive charge of the peptides.

The results of cytokine study showed that mung peptide could activate macrophages and exert immune activity, but it did not cause inflammation, and this was related to the molecular weight of mung peptide. Mung bean peptide can enhance the life activities of normal cells and improve their resistance to infection. At the same time, mung bean peptide can play an antagonistic role in inflammatory cells.

Kangcare will always be here if you have any inquiries.





免疫力

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研究背景:

免疫力,我们可以把它定义为人体识别和抵御外来入侵的能力。所有的疾病都与免疫力有关,没有免疫力,人几天都活不了,怎么强调人体免疫的重要性都不为过。

人体存在着强大的免疫力,它是抵抗病毒的关键所在,在如今新冠肺炎疫情之下,对每个人而言,只有通过自身免疫力的严防死守,才能减少病毒的侵害。

Kangcare 专注于免疫研究,通过以下三大作用机制进行免疫调节:

一, 增加巨噬细胞活性;

巨噬细胞是重要的免疫细胞,通过分泌促炎细胞因子、趋化因子、NO、PGE2 以及炎症蛋白的表达来调节炎症和宿主防御。巨噬细胞分泌 NO 和细胞因子,增加活性,并增加巨噬细胞溶菌酶的分泌量,增加巨噬细胞的活性。

*BRM 激活免疫细胞 T,B,NK,巨噬细胞等:

多糖类生物免疫应答调节剂 (BRM) 与巨噬细胞等免疫细胞表面模式识别受体 (PPR) 结合启动了免疫应答,大多数 BRM 为 β -葡聚糖, BRM 和巨噬细胞等表面多糖受体结合,激活了细胞信号转导途径,促使白介素-1 (IL-1)、 α -肿瘤坏死因子 (TNF- α)、 γ -干扰素 (IFN- γ)、NO 等细胞因子的分泌量增加,这些免疫活性因子作为细胞间相互作用的内源性信号,继发

地诱导产生其他细胞因子，像 IL-2、IL-6、IL-8、IL-12、Ig-G，对机体的免疫应答起到调节作用，IL-1 和 IL-2 能促进 T 细胞繁殖，促进 B 细胞产生抗体，增强 CTL 和 NK 细胞的杀伤功能，TNF- α 和 IFN- γ 对肿瘤细胞具有直接细胞毒作用和生长抑制作用，NO 对肿瘤细胞和微生物病原体具有很强的杀伤作用。



二，调节 Th1/Th2（辅助性 T 细胞）平衡；

由于 Th1 细胞和 Th2 细胞都能分泌细胞因子促进自身的增值并一直对方的增值，因此在正常情况下集体中 TH1 细胞和 Th2 细胞处于相对平衡的状态。但是当机体发生功能异常时，常表现出平衡偏向其中一方，称为“Th1/Th2 漂移”。一旦 Th1 细胞和 Th2 细胞之间的平衡被打破，很可能造成人体细胞因子网络的动态平衡被破坏，进而引起许多疾病的产生和发展。许多研究正倾向于发现、开发能逆转或稳定 Th1/Th2 平衡的药物和方法。

三，通过钙离子帮助激活 T 细胞；

钙离子能够改变脂质分子功能，从而帮助 T 细胞活化，提高其对外来抗原的敏感性，有助于机体清除病原体。在 T 细胞活化后，细胞表面的钙离子通道自动开放，促使细胞内的钙离子浓度增高，并可持续数小时。钙离子可以双向调节 T 细胞功能，如被肿瘤组织浸润的 T 细胞免疫功能底下时，可增进 T 细胞功能恢复，又如在器官移植排异、自身免疫疾病发作时，也可抑制其反应过度。



推荐原料:

(1) 谷胱甘肽:

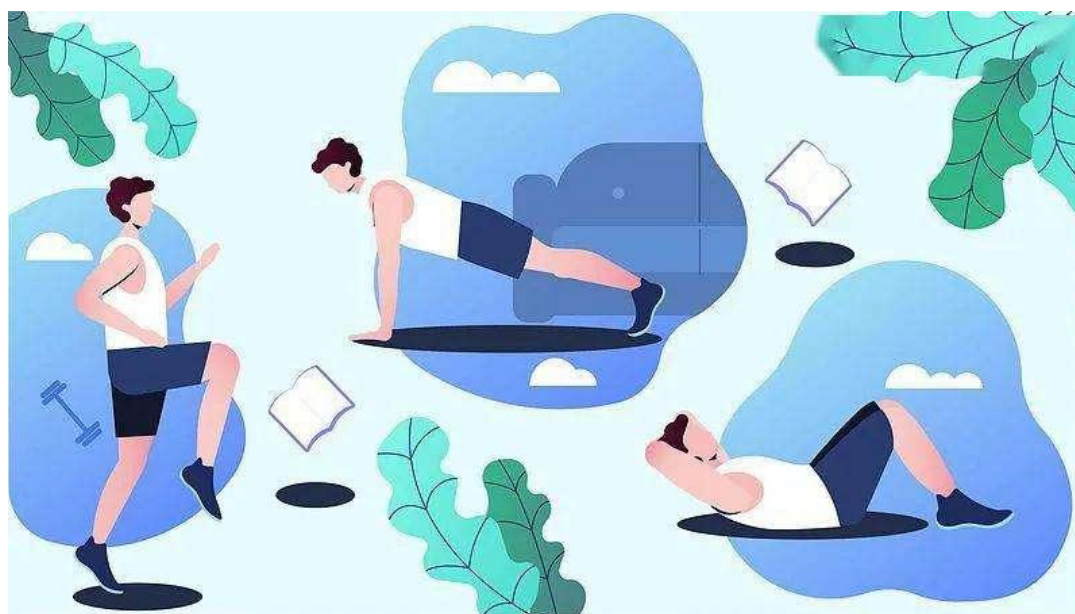
谷胱甘肽的免疫机制有两种，一是调节中性粒细胞和树突细胞的活性，二是调控 T 细胞增殖和活性，GSH 水平通过调节细胞因子模式以及抗原呈递细胞的细胞环境，从而控制 Th1/Th2 平衡。GSH 耗竭会导致 Th2 反应占优势，抑制淋巴细胞 CD8+ 和细胞毒性淋巴细胞功能，并激活 CD4+ 和 T 淋巴细胞，导致炎症/免疫介导性疾病。多种炎症病变和免疫失调症均与 GSH 胞内水平变化、Th1/Th2 平衡发生漂移有关，包括类风湿性关节炎、自身免疫性甲状腺炎、肌萎缩侧索硬化症、艾滋病、阿尔茨海默病、酒精性肝病、白内障和急性呼吸窘迫综合征等。

(2) 酵母β-葡聚糖:

研究证明，酵母β-葡聚糖能够与巨噬细胞结合而激活巨噬细胞；另外能激活 T 淋巴细胞、B 淋巴细胞、巨噬细胞、自然杀伤细胞（NK）等发挥免疫增强剂的作用；它还可分泌一些激活免疫细胞的细胞因子；还可活化胃肠组织中的嗜中性粒细胞和吞噬细胞，由此进一步活化和影响“免疫—神经—内分泌”调控网络，增强其抗感染、抗应激和细胞适应性保护能力，同时，还具有吸附、排除霉菌毒素，抗辐射，促进伤口愈合等作用。

(3) 菊粉:

菊粉能选择性地促进肠道有益菌的生长和代谢，抑制有害菌的生长，调节肠道菌群平衡，能够增加抗氧化酶和谷胱甘肽 S-转移酶的基因表达，能增加钙结合蛋白的表达，促进钙离子的吸收，能够促进肠细胞的增殖，从而增加肠道吸收表面积。



(4) L-茶氨酸:

L-茶氨酸主要通过以下三种作用机制从而增强机体免疫力：一是显著增加血清中 IL-2 和 IFN- γ 的含量，增强抗病能力；二是它能激活 $\gamma\delta$ T 细胞，并分泌干扰素- γ (IFN- γ) 和肿瘤坏死因子- α (TNF- α)，杀伤感染的细胞并呈递抗原给 $\alpha\beta$ T 细胞，协助 B 细胞产生抗体，提高机体的免疫能力；三是 L-茶氨酸与胱氨酸单用或联用能促进免疫细胞中 GSH 合成，增强抗氧化能力，提高机体的免疫功能。

(5) 食源性生物活性肽：

食源性蛋白肽具有免疫调节活性与其肽段的氨基酸组成、序列、长度、电荷、疏水性和肽分子结构有关。研究表明，拥有疏水性氨基酸、谷氨酰胺、谷氨酸、酪氨酸、色氨酸、半胱氨酸、天冬酰胺和天冬氨酸等残基的蛋白肽具有较强的免疫调节活性，食源性蛋白肽的免疫调节功能和抗炎作用与肽的正电荷密切相关。

细胞因子研究结果发现绿豆肽可以激活巨噬细胞，发挥免疫活性，但其不会引起机体的炎症反应，并且这与绿豆肽的分子量具有一定的相关性；绿豆肽可增强正常细胞生命活动，提高其抗感染性；同时，绿豆肽对于炎性细胞又可发挥拮抗炎症的作用。

