Inflammation is a Destructive and Self-perpetuating Process

Synergistic Inhibition of NF-kappaB as an Underlying Scientific Basis for Phytonutritional Supplementation and Dietary Modification of Inflammatory Pathways

An effective combination of these products may reduce the activation of NF-kappaB, thereby modifying inflammatory pathways.

References

Alex Vasquez, DC, ND, DO
1. NF-kappaB is a molecule inside each cell that promotes pain and inflammation, and is associated with auto-immune and other unwanted health conditions.

2. Inhibition of NF-kappaB is emerging as a primary goal for the reduction of pain and inflammation.

3. Several natural products safely and effectively inhibit NF-kappaB, and they can be used in combination to help doctors attain improved outcomes in their patients.

4. Application of this research is simple:
   a. low-fat, low-sugar diet
   b. daily use of:
      i. Bio-D-Mulsion Forte™: 1-2 drops per day
      ii. KappArest™: 4 caps 2 times per day
      iii. Optimal EFAs™: 1-3 caps per day

New research is showing that many inflammatory health problems are associated with inappropriate activation of nuclear transcription factor kappaB, generally referred to as NF-kappaB. Therefore, inhibition of NF-kappaB is now a major goal towards improving the well-being of patients.1

### Bio-D-Mulsion Forte™

These products work together to promote optimal health.

- **In the cytosol, NF-kappaB is made inactive by inhibitor kappaB.**

- **Exposure to “stressful stimuli” such as LPS or oxidative stress, activates “inhibitory kappaB kinase”, which phosphorylates IKB for destruction.**

- **Once IKB is destroyed, then NF-kappaB is free to bind with DNA.**

#### Inflammatory genes

- C-reactive protein (CRP)
- Interleukin-6 (IL-6)
- Tumor necrosis factor (TNF-a)
- Adhesion molecules
- NF-kappaB

#### Natural Interventions that Inhibit NF-kappaB

<table>
<thead>
<tr>
<th>Bio-D-Mulsion Forte™</th>
<th>Quote/example from the research literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>vitamin D</td>
<td>- 1. Alpha-dihydroxyvitamin D (1,25-(OH)2-D3), the active metabolite of vitamin D, can inhibit NF-kappaB activity in human MRC-5 fibroblasts, targeting DNA binding of NF-kappaB but not translocation of its subunits p50 and p65.16 - Thus, 1,25(OH)2D3 may negatively regulate IL-12 production by downregulating NF-kappaB activation and binding to the p40 b sequence.17 - Clinical studies have documented the benefits of vitamin D consumption, including studies of those with critical conditions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KappArest™</th>
<th>Quote/example from the research literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turmeric-curcumin</td>
<td>- Curcumin, EGCG and resveratrol have been shown to suppress activation of NF-kappaB.14</td>
</tr>
<tr>
<td>Lipoic acid</td>
<td>- ALA reduced the TNF-alpha-stimulated ICAM-1 expression in a dose-dependent manner to levels observed in unstimulated cells. Alpha-lipoic acid also reduced NF-kappaB activity in these cells in a dose-dependent manner.</td>
</tr>
<tr>
<td>Green tea extract</td>
<td>- In conclusion, EGCG is an effective inhibitor of NF-kappaB activity. This may explain, at least in part, some of the reported anti-inflammatory effects of green tea.</td>
</tr>
<tr>
<td>Rosemary</td>
<td>- These results suggest that carnosol suppresses the NO production and iNOS gene expression by inhibiting NF-kappaB activation, and provide possible mechanisms for its anti-inflammatory and chemopreventive action.17</td>
</tr>
<tr>
<td>Grape seed extract</td>
<td>- Constitutive and TNF-alpha-induced NF-kappaB DNA binding activity was inhibited by GSE at doses &gt; or =50 microg/ml and treatments for &gt; or =12 h.18</td>
</tr>
<tr>
<td>Propolis</td>
<td>- Caffeic acid phenethyl ester (CAPE) is an anti-inflammatory component of propolis (honeybee resin). CAPE is reportedly a specific inhibitor of nuclear factor-kappaB (NF-kappaB).</td>
</tr>
<tr>
<td>Resveratrol</td>
<td>- Resveratrol’s anti-inflammatory and growth-modulatory effects may thus be partially ascribed to the inhibition of activation of NF-kappaB and AP-1 and the associated kinases.19 - Both resveratrol and quercetin inhibited NF-kappaB DNA binding transcription to a greater extent than the glucocorticosteroid, dexamethasone.20</td>
</tr>
<tr>
<td>Phytolens®</td>
<td>- Phytolens™ is Biotics Research Corporation’s patented polyphenolic extract from lentils. Published research has documented that Phytolens® exhibits broad-based antioxidant properties, is a free radical scavenger, and shows beneficial effects on inflammatory processes.21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Optimal EFAs™</th>
<th>Findings from the research literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALA</td>
<td>- <strong>CONCLUSIONS:</strong> Dietary supplementation with ALA for 3 months significantly decreases CRP, SAA and IL-6 levels in dyslipidemic patients. This effect may provide a possible additional mechanism for the beneficial effect of plant n-3 polyunsaturated fatty acids in support of coronary and cardiac health.22</td>
</tr>
<tr>
<td>EPA and DHA</td>
<td>- EPA-derived eicosanoids include the reduction in the production of pro-inflammatory eicosanoids such as LT-B4, PAFs, and cytokines such as TNF-alpha and IL-1, as well as a large reduction in PG-E2 and TX-B2.23 - DHA, like EPA, is an important component of cell membranes. DHA functions by improving receptor function and signal transduction. Bioactive metabolites of DHA (docosatetraenoids and resolvins) mediate potent anti-inflammatory benefits; and DHA appears essential for optimal cognitive function.24</td>
</tr>
<tr>
<td>GLA</td>
<td>- GLA is the “health-promoting” n-6 fatty acid. GLA’s benefits rely on its elongation to the biologically active DGLA from which eicosanoids that have cardioprotective and anti-inflammatory benefits are derived.25,26</td>
</tr>
</tbody>
</table>

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.

---

**NF-kappaB**

- Inhibitor of NF-kappaB

- **NF-kappaB enters the nucleus and binds with DNA to activate genes which encode for the increased production of inflammatory mediators.**

- **Increased production of inflammatory mediators - such as cytokines, prostaglandins, and leukotrienes - promotes cellular dysfunction and tissue destruction.**

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.