

*“Familiarity can blind you”*

—Robert M. Pirsig from *Zen and the Art of Motorcycle Maintenance*<sup>1</sup>

## Joint Care

Pain is part of the game and even something you may purposefully seek out: Enduring pain – when training in the gym or when dieting down to subhuman levels of body fat – is part and parcel of competitive bodybuilding. By embracing this pain, it’s easy to become so familiar with it that one seemingly forgets that pain, especially **joint pain**, in and of itself is **not** the goal. In fact, joint pain can severely hamper your gains if you can’t train properly.

Granite Supplement’s Joint Care formula is combines two rising stars in the joint care supplement scene (plus [Bioperine®](#) to optimize absorption):

- **Undenatured collagen** (as 40mg of [UCII®](#)) to ensure your body’s immune system is being kind to your joints.
- [Curcumin C3 Complex®](#) (500mg), a blend of three turmeric-derived curcuminoids designed to both prevent formation and quench free radicals.
- [Bioperine®](#) (2.5mg) Curcumin C3 Complex is coupled with Bioperine (2.5mg) to chauffeur the curcuminoids into your bloodstream<sup>2,3</sup>.

### Undenatured Collagen as [UCII®](#) (40mg)

- Because the cartilage that allows our joints to articulate freely is largely composed of collagen, specifically of the type II form<sup>4-8</sup>, it’s not surprising that common joint inflammation [a.k.a. (osteo)arthritis] reflects proper upkeep of this important protein<sup>9</sup>. Healthy inflammatory responses are a function of the immune system, of course, which has the formidable task of surveilling the body’s own proteins, those derived from symbiotic bacteria (in the microbiome), as well as those we’ve consumed<sup>10,11</sup>.
- Consuming type II collagen in it’s **undenatured** form (not broken down in any way) confers immuno-tolerance<sup>10</sup> as it passes through the gut’s “immuno-check points” called Peyer’s patches<sup>12</sup>, informing the immune system that type II collagen is not pathogenic. (This is a good thing!) In both humans<sup>13,14</sup> and animals<sup>15-18</sup> with arthritis, **consuming** undenatured collagen orally reduces arthritic symptoms, whereas direct injection of type II collagen (bypassing the Peyer’s patches) can trigger immunoreactive arthritis<sup>19,20</sup>.
- In horses<sup>18</sup> and dogs<sup>15,17</sup>, only very small doses of UC-II® undenatured type II collagen is enough to alleviate osteoarthritis. In a study of human subjects with pre-existing knee osteoarthritis of the knee and **for whom a glucosamine / chondroitin combo was not effective**, consuming UC-II® (40mg / day) for 90 days reduced knee pain and improved several indices of physical function during daily life (e.g., when walking and climbing stairs)<sup>21</sup>.
- More impressively, UC-II may **improve joint function** even when you’re not aware you have joint issues! In **healthy individuals** neither complaining of knee pain nor meeting diagnostic criteria for knee arthritis, 120 days of UC-

II® (40mg / day) increased joint **range of motion** and extended the exercise time on a **stepmill** before reporting **knee pain**<sup>22</sup>. Additionally, those with osteoarthritis who already use an NSAID like acetaminophen (brand name Tylenol®) may find that undenatured collagen Type II has an additive effect in relieving symptoms<sup>23</sup> that comes without side effects<sup>24</sup>.

### **Curcumin C3 Complex® (500mg)**

- Exercise in general (barring an injury, of course) is good for the joints, but most of you know full well that heavy lifting can inflame your joints and eventually take its toll<sup>25,26</sup>. Curcumin C3 Complex® was designed specifically to both neutralize and prevent the formation of free radicals<sup>27</sup>, known to play a role in arthritis<sup>28-31</sup>.
- While animal research supports Curcumin C3 Complex®' anti-arthritic effect<sup>32</sup>, only large doses Curcumin C3 Complex® will substantially elevate blood levels<sup>33,34</sup>. For this reasons we've added **Bioperine®** (2.5mg; see below) to ensure bioavailability<sup>2,35</sup> and that Curcumin C3 Complex® can thus inhibit of prostaglandin formation<sup>36</sup> [which is also the mechanism of action of non-steroidal anti-inflammatory pain-killers like aspirin<sup>37</sup>].
- With the 500mg of Curcumin C3 Complex® (plus 2.5mg of Bioperine®) in each dose of **Joint Care**, we've got you going in the right direction to take full advantage of the joint pain-alleviating effects of Curcumin C3 Complex®. When 1500mg / day (500mg of Curcumin C3 Complex® plus 5mg of Bioperine, three times per day) was given to mild-to-moderate sufferers of knee osteoarthritis, all measures of joint pain and physical function improved compared to placebo, and more than 80% of those all those taking Curcumin C3 Complex® voluntarily reduced their use of non-steroidal anti-inflammatories<sup>38</sup>.
- Interestingly, in this study<sup>39</sup>, unlike others where subjects have metabolic syndrome<sup>40,41</sup>, Curcumin C3 Complex® did not reduce **systemic** inflammatory markers. This suggests that Curcumin C3 Complex®' effects in limiting oxidative stress is the key here<sup>41,42</sup>, or possibly even it's ability to inhibit cyclooxygenase and thus prostaglandin synthesis<sup>36,43-46</sup> may be underlying it's efficacy.
- For those who might already be using Tylenol (acetaminophen) for joint pain, preliminary evidence suggests that curcuminoids like those found in C3 complex do not interfere with acetaminophen metabolism<sup>47</sup>.

### **Bioperine® (2.5mg)**

- When it comes to many dietary supplements, bioavailability (absorption) is the name of the game. To enhance the availability of Curcumin C3 Complex® (see above), Joint Care contains 2.5mg of **Bioperine®**, a black pepper extract containing 95+% **piperine**. By inhibiting p-glycoprotein's actions<sup>48</sup> and preventing glucoronidation in the gut<sup>49</sup>, **piperine** diminishes the intestinal barrier for many substances<sup>50</sup> and makes them more lipid soluble (and thus able to traverse lipid membranes). Indeed, piperine has a good record of increasing bioavailability of drugs and supplements<sup>48</sup>, including of course

curcumin<sup>2,35</sup>, as well as beta-carotene<sup>51</sup>, resveratrol<sup>52</sup>, iron<sup>53</sup>, selenium<sup>54</sup> and CoQ<sub>10</sub><sup>55</sup>.

**Disclaimer** Piperine may interact with drug metabolism<sup>48</sup>. The above statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

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