**Indole-3-Propionic Acid (IPA)**

**Why Indole-3-Propionic Acid is important:**
Indole-3-Propionic Acid (IPA) is one of the strongest antioxidants in the body and is a critical marker of a healthy gut microbiome. IPA plays a crucial role in maintaining a healthy gut by strengthening the tight cellular junctions of the intestinal wall. The bacteria *Clostridium sporogenes* produce IPA from the amino acid tryptophan.

IPA is also important for brain health because it acts as a potent neuroprotective agent that inhibits beta-amyloid fibril formation.

**Indole-3-propionic acid is involved in calculating scores for:**
- Gastrointestinal Fitness
- Immuno Fitness
- Cognitive Acuity

**When Indole-3-Propionic Acid is ABOVE optimal levels:**
- It is ideal to have higher levels of IPA, but when IPA is above optimal levels it usually means the client has a gut bacteria imbalance, known as *dysbiosis*.
- When IPA is above optimal levels, a client might experience poor sleep, a weakened immune system, or GI distress such as bloating, inconsistent digestion, or abdominal pain.
- Review the Ixcela report for the nutrition recommendations related to fiber consumption. Work with your client to diversify fiber intake. Advise them to add 3 or 4 vegetables they would typically not eat to their shopping list.
- **SMART Goal example:**
  - *I will include 1 cup of vegetables (broccoli, spinach, onion, bell pepper, etc.) in an omelet for breakfast on Monday through Friday this week.*

**When Indole-3-Propionic Acid is BELOW optimal levels:**
- It usually means that the client has a gut bacterial imbalance. This could be related to chronic physical or mental stress or poor dietary habits.
- When IPA is below optimal levels, a client might experience symptoms related to leaky gut (GI distress such as bloating, inconsistent digestion, or abdominal pain) as well as brain fog, poor sleep, or a weakened immune system.
Indole-3-Propionic Acid (IPA)

When Indole-3-Propionic Acid is BELOW optimal levels (continued):
- It is also common to have sensitivities to dairy, gluten, eggs, and soy, so a client might feel unwell after most meals. This is related to food particles “leaking” through the intestinal cell wall and triggering an immune response. Once IPA is within optimal levels, the client might notice that they can tolerate foods they previously thought they were sensitive to.
- Review the mindfulness and nutrition recommendations in the Ixcela report. Practicing the stress-reduction techniques found in the mindfulness section will help to heal the gut and create an optimal environment for *Clostridium sporogenes*. Consider including a daily serving of fermented foods and starting a multi-strain probiotic like Ixcela Biome Support.
- **SMART Goal example:**
  - *I will wake up 15 minutes early on Monday and Wednesday this week to sit quietly and complete a stretching sequence before I get ready for the day.*

More about Indole-3-Propionic Acid:
- Indole-3-propionic acid is included in Ixcela’s Indole Group because it is produced by bacteria in the gut from the amino acid tryptophan.
- IPA production depends on the health of the gut microbiome. Including fermented foods like kimchi, sauerkraut, kefir, yogurt, miso, fermented pickles, and fermented bean curd several times per week may benefit the gut microbiome and increase IPA production.
- Adequate fiber in the diet is also important for maintaining a healthy gut. Examples of fiber-rich foods include vegetables, fruits, whole grains, and sprouted beans and legumes. Refer to the fiber recommendation in the client’s report for a full list of fiber-rich foods. The fiber in these items is a food source for specific bacteria in your gut, and it assists in the production of short-chain fatty acids (SCFA).
  - As bacteria in the gut ferment dietary fiber, short-chain fatty acids are produced. Short-chain fatty acids, like butyrate, are important for a variety of health processes including immune function, digestive health, and weight maintenance.
- To support IPA levels, Ixcela recommends consuming sprouted seeds (e.g., chickpeas, mung beans, and black beans) at least 3 times per week. Sprouts can often be found in the produce section of the grocery store.
- Avoiding foods that are detrimental to the gut is important for maintaining optimal IPA levels. Foods to avoid include refined carbohydrates, simple sugars, and omega-6 oils (vegetable or nut oils).