Diagnostic Solutions laboratory

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Patient: Ima Sample
Accession:
Collected:
Received:
DOB:
Completed:
External ID #:
Ordered by: Diane Farhi, MD

FAP™ FATTY ACIDS PROFILE

METHODOLOGY: GC-MS - Fatty Acids Plasma

YOUR PERSONALIZED REPORT

SATURATED FATTY ACIDS

	Saturated	Result	20% 40% 60% 80%	Reference
1	**Total Saturated**	**1.76e3 H**		4.70e2 - 1.72e3 nmol/mL
2	**Myristic 14:0** *Protein myristoylation via N-myristoyl transferase*	**1.15e1**		2.23e0 - 4.49e1 nmol/mL
3	**Palmitic 16:0** *Delta-9-desaturase + iron*	**1.32e3 H**		3.21e2 - 1.28e3 nmol/mL
4	**Stearic 18:0** *Delta-9-desaturase + iron*	**4.20e2 H**		1.43e2 - 4.11e2 nmol/mL
5	**Arachidic 20:0** *Precursor to prostaglandins*	**5.15e0**		1.90e0 - 5.57e0 nmol/mL
6	**Docosanoic 22:0** *VLCFA, undergoes beta-oxidation*	**1.51e0 L**		4.73e0 - 1.25e1 nmol/mL
7	**Lignoceric 24:0** *VLCFA, undergoes beta-oxidation*	**2.16e0 L**		7.95e0 - 1.36e1 nmol/mL

MONOUNSATURATED FATTY ACIDS

	Monounsaturated	Result	20% 40% 60% 80%	Reference
8	**Total Monounsaturated**	**1.67e2 L**		2.22e2 - 6.19e2 nmol/mL
9	**Palmitoleic 16:1n7** *Elongation via beta-oxidation*	**2.11e1**		7.65e0 - 1.10e2 nmol/mL
10	**Vaccenic 18:1n7** *Elongation*	**1.55e1**		1.36e1 - 6.62e1 nmol/mL
11	**Oleic 18:1n9** *Elongation*	**1.24e2**		1.16e2 - 5.47e2 nmol/mL
12	**Eicosenoic 20:1n9** *Elongation*	**6.83e0**		3.53e0 - 9.23e0 nmol/mL

KEY: < dl = Results below detection limit.

The assays were developed and/or the performance characteristics determined by Diagnostic Solutions Laboratory. The results are for research and not for diagnostic purposes.

Patient: Sample, Ima **Accession:**

FAP™ FATTY ACIDS PROFILE

POLYUNSATURATED FATTY ACIDS

	Omega-3	Result	20% 40% 60% 80%	Reference
13	**Total Omega-3**	**6.84e1 L**		7.57e1 - 1.56e2 nmol/mL
14	**α-Linolenic (ALA) 18:3n3** *Delta-6-desaturase + B2, B3, B6, C, Mg, zinc*	**8.70e0**		7.55e0 - 3.82e1 nmol/mL
15	**Eicosanoic (EPA) 20:5n3** *Elongase + B3, B5, B6, biotin, C*	**1.04e1**		8.15e0 - 3.36e1 nmol/mL
16	**Docosapentaenoic (DPA) 22:5n3** *Delta-4-desaturase*	**1.71e1**		1.20e1 - 3.10e1 nmol/mL
17	**Docosahexaenoic (DHA) 22:6n3** *COX, LOX or delta-4-desaturase*	**3.22e1**		2.78e1 - 1.07e2 nmol/mL

	Index of Omega-3	Result	20% 40% 60% 80%	Reference
18	**% EPA + DHA** *Total Percent EPA + DHA / Total Fatty Acids*	**1.3 L**		> 1.7

	Omega-6	Result	20% 40% 60% 80%	Reference
19	**Total Omega-6**	**1.27e3**		5.20e2 - 1.28e3 nmol/mL
20	**Linoleic (LA) 18:2n6** *Delta-6-desaturase + B2, B3, B6, C, Mg, zinc*	**8.05e2**		2.69e2 - 1.01e3 nmol/mL
21	**γ-Linolenic (GLA) 18:3n6** *Elongase + B3, B5, B6, biotin, C*	**1.88e1**		1.35e0 - 2.52e1 nmol/mL
22	**Eicosadienoic 20:2n6** *Rapidly metabolized to DGLA & AA*	**1.34e1**		6.60e0 - 1.52e1 nmol/mL
23	**Dihomo-γ-linolenic (DGLA) 20:3n6** *Delta-5-desaturase + B2, B3, B6, C, Mg, zinc*	**6.61e1**		2.28e1 - 1.18e2 nmol/mL
24	**Arachidonic (AA) 20:4n6** *Elongase + B3, B5, B6, biotin, C*	**3.62e2 H**		8.81e1 - 3.41e2 nmol/mL
25	**Docosatetraenoic 22:4n6** *Delta-4-desaturase*	**4.60e0 L**		8.49e0 - 1.90e1 nmol/mL

	Omega-6 / Omega-3 Ratio	Result	20% 40% 60% 80%	Reference
26	**Omega-6 / Omega-3 Ratio** *Total Ratio*	**18.57 H**		< 12.50

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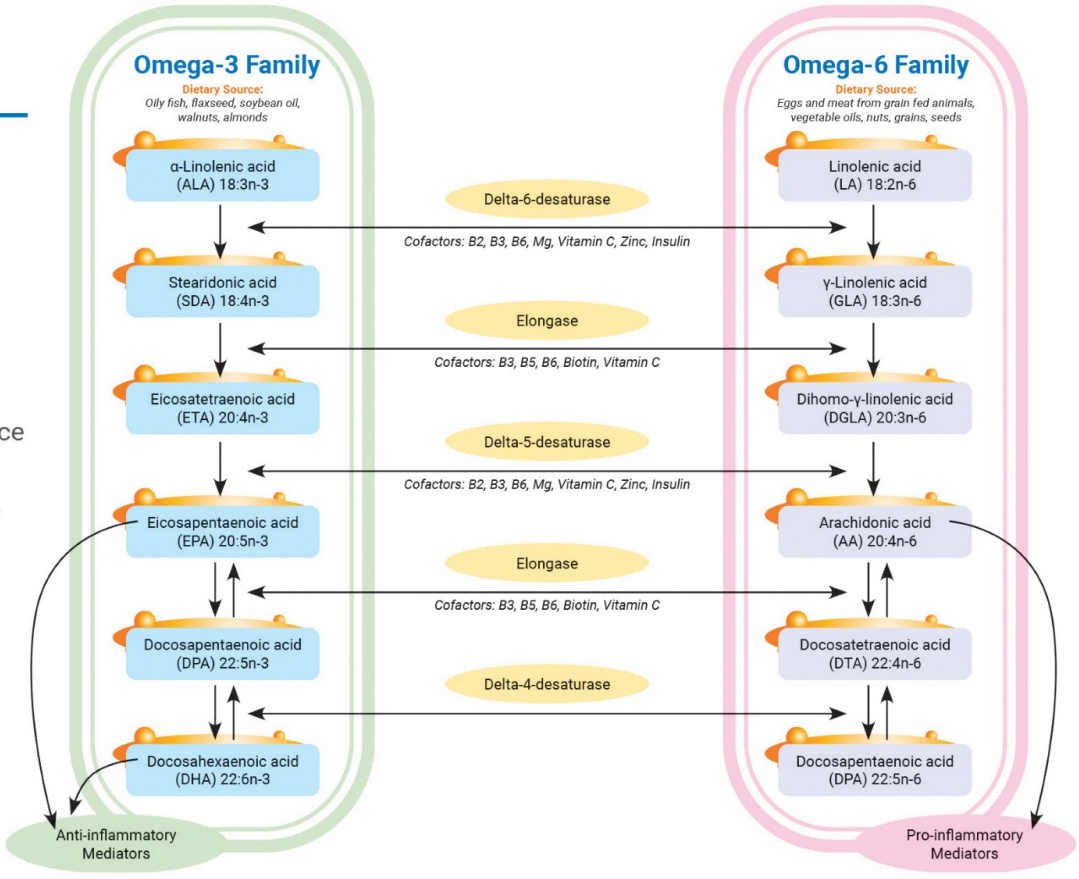
DESATURASE ENZYME ACTIVITY

	Desaturase Enzyme Activity	Result	20% 40% 60% 80%	Reference
27	**Delta-6-desaturase** *18:3n6 (GLA) / 18:2n6 (LA)*	**0.023**		0.001 - 0.041
28	**Delta-5-desaturase** *20:4n6 (AA) / 20:3n6 (DGLA)*	**5.48**		> 1.17
29	**Delta-9-desaturase** *18:1n9 (Oleic) / 18:0 (Stearic)*	**0.30**		< 1.70

KEY: < dl = Results below detection limit.

PUFA Fatty Acid Metabolism

- Biological mediators are synthesized from omega-3 and omega-6 polyunsaturated fatty acids (PUFAs).
- The conversion of precursor omega-3 and omega-6 PUFA to their respective derivatives is catalyzed by desaturase and elongase enzymes in the presence of appropriate cofactors.
- Anti-inflammatory mediators are derived from EPA and DHA.
- Pro-inflammatory mediators are derived from arachidonic acid (AA).
- These pathways can compete for enzymes if nutritional levels are imbalanced.



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SUMMARY OF FUNCTIONAL IMBALANCES

Note: *The findings on this page are designed to give you a high-level overview of your current functional imbalances.*

FUNCTIONAL CATEGORY	Finding	Intervention Considerations
SATURATED FATTY ACIDS		
Total Saturated	**High** ▲	Primary sources include butter, red meat, beef tallow, high-fat dairy, palm oil, peanut oil, corn oil, and coconut oil.
Palmitic 16:0	**High** ▲	Associated with increased metabolic issues. Evaluate intake of palm kernel oil, butter, beef, salmon, egg yolks, and cocoa butter.
Stearic 18:0	**High** ▲	Associated with metabolic issues. Evaluate intake of butter, red meat, egg yolks, and cocoa butter.
Docosanoic 22:0	**Low** ▼	Evaluate overall fatty acid intake. Food sources include rapeseed (canola) oil, peanuts, and peanut oil. Decreased with alcohol intake.
Lignoceric 24:0	**Low** ▼	Evaluate overall fatty acid intake and supplementation.
MONOUNSATURATED FATTY ACIDS		
Total Monounsaturated	**Low** ▼	Reflects MUFAs over days to weeks; primary sources include nuts, dairy, and olive oil. Individual MUFAs may impact CVD.
Vaccenic 18:1n7	**Borderline Low** ▼	Evaluate overall fatty acid intake. Food sources include dairy products.
Oleic 18:1n9	**Borderline Low** ▼	Evaluate intake of olive oil, pecan oil, sunflower oil, and canola oil. Endogenously made from stearic acid via delta-9-desaturase.

SUMMARY OF FUNCTIONAL IMBALANCES

Note: *The findings on this page are designed to give you a high-level overview of your current functional imbalances.*

FUNCTIONAL CATEGORY	Finding	Intervention Considerations
POLYUNSATURATED FATTY ACIDS		
Total Omega-3	**Low** ▼	Lower omega-3 correlated with poor diet; evaluate omega-6/ omega-3 ratio.
α-Linolenic (ALA) 18:3n3	**Borderline Low** ▼	Consider supplementation or an increase in ALA-rich foods such as flaxseeds, chia seeds, and walnuts.
% EPA + DHA	**Low** ▼	Consider increasing dietary intake or supplementation with omega-3 fatty acids.
Total Omega-6	**Borderline High** ▲	Higher omega-6 correlated with poor diet; evaluate omega-6/ omega-3 ratio.
γ-Linolenic (GLA) 18:3n6	**Borderline High** ▲	Evaluate supplementation and intake of borage, black currant, evening primrose, and safflower oil. Check elongase cofactors: B3, B5, B6, biotin, vitamin C.
Arachidonic (AA) 20:4n6	**High** ▲	Precursor to pro-inflammatory/pro-aggregatory mediators. Increases with overnutrition or a high-fat diet.
Docosatetraenoic 22:4n6	**Low** ▼	Evaluate fatty acid and total caloric intake. Food sources include sardines, black sea bream, beef, and pork.
Omega-6 / Omega-3 Ratio	**High** ▲	Associated with risk of all-cause, cancer, and cardiovascular disease mortality. Reduce intake of omega-6 fatty acids.
DESATURASE ENZYME ACTIVITY		
No Functional Imbalances Detected	**Within Range** ◆	All desaturase activity is within normal ranges.

PERSONALIZED METABOLOMIC RECOMMENDATIONS

NUTRIENT SUPPORT RECOMMENDATIONS KEY

Moderate Need for Nutrient Support | **Significant Need for Nutrient Support**

Note: *Nutrient supplementation is up to the treating clinician's discretion with full understanding of the patient's medical history and current clinical condition.*

Patterns Of Concern	Recommendations	Provider Comments
Low Index of Omega-3	Increase foods high in EPA & DHA such as salmon, sardines, herring, and mackerel.	
High Omega-6/Omega-3 Ratio	Reduce omega-6 foods and supplementation; increase omega-3 supplementation.	
High Total Saturated	Reduce intake of saturated fats such as butter, red meat, beef tallow, high-fat dairy, palm oil, peanut oil, corn oil, and coconut oil.	
Low Total Monounsaturated	Check total dietary fat; consider replacing saturated fat with monounsaturated fat. Sources include nuts, dairy, olive oil, and avocado.	