Live Blood Analysis:
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Live Blood Analysis: Patient Results

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The Task:

We have been requested to analyse patient data from Australian Biologics and comment in the form of an official scientific report on the significant correlations that could exist between results provided by General Practitioners and the request for the Live Blood Analysis Test and Standard Biological Pathology Tests that were also requested or comments made by the GPs that were related to the diagnoses of the patients.

The following Excel Spreadsheets were provided:

1. Live Blood Analysis and Red Blood Cell Morphology
2. Live Blood Analysis and Immune Function
3. Live Blood Analysis and Digestive System Function
4. Live Blood Analysis and Fat Metabolism
5. Live Blood Analysis and Liver Function
6. Live Blood Analysis and Gallbladder Function
7. Live Blood Analysis and Bowel Toxicity

Definition of Terms and Abbreviations:

Anisocytosis: A condition where the red blood cells are unequal in size, evident on blood smear.

Microcytosis/Mirocythemia: Abnormally small red blood cells, found in some types of anaemia.

Macrocytosis: Macrocytosis is enlargement of the red blood cells as defined by a red cell mean corpuscular volume (MCV) of greater than 100 fl.

Macrocytosis is present in 1 to 4 % of the adult population. The most common cause is alcoholism. Other causes include: nutritional deficiencies (B12 and folate), chemotherapy, drug side effects, haemolysis, liver dysfunction, myelodysplasia and hypothyroidism.

Poikilocytosis: Irregularity of red cell shape

Elliptocytosis: Haematologic disorder characterised by elliptically shaped red blood cells (elliptocytosis) with variable breakup of red cells (haemolysis) and varying degrees of anaemia. Inherited as a dominant trait. Due to mutation (change) in one of the genes encoding proteins of the red cell membrane skeleton. There are at least 2 forms of elliptocytosis, one form unlinked to the Rh blood group and another form linked to Rh (now known to be on chromosome 1). The Rh-linked form, (EL1) in chromosome region 1p34.2-p33 is due to a mutation in erythrocyte membrane protein 4.1. Forms of elliptocytosis not linked to Rh are due to mutations in the alpha-spectrin gene, the beta-spectrin gene, or the band 3 gene.

Target cells: An erythrocyte in target cell anaemia, with a dark centre surrounded by a light band that again is encircled by a darker ring; it thus resembles a shooting target; such cell's also appear after splenectomy.

Acanthocytosis: A rare condition where the majority of red blood cells are acanthocytes (red blood cells with multiple spiny cytoplasmic projections), a feature of abetalipoproteinaemia.

Schistocytosis: The occurrence of many schistocytes in the blood. Schistocytes are fragments of red blood cells found in the circulation

Hypersegmented Neutrophils: An aged and degenerated neutrophil in which there may be 6 to 10 lobes in the nucleus.

Eosinophilia: The formation and accumulation of an abnormally large number of eosinophils in the blood

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FBE: Full Bloood Analysis.

RBC: Red Blood Cell

WBC: White Blood Cell

AB: Australian Biologics

Path: Pathology

LBA: Live Blood Analysis

Summary of the Data:

We have found considerable correlations between numerous standard pathology generated results, comments provided by General Practitioners and the Live Blood Analysis results on 278 patients.

The Live Blood Analysis provided information on:

- Red Blood Cell Morphology and the Oxygen Carrying Capacity of the Blood and how this correlated with normal and abnormal FBE pathology. The data are presented in Table 1. There was a strong correlation for microcytosis, macrocytosis, anisocytosis and acanthocytosis. Moderately strong correlations were observed for poikilocytosis, elliptocytosis and schistocytosis.
- Immune Function and White Blood Cell Morphology and how these correlated with immune function subset cells and their markers and bacterial infections. . The data are presented in Table 2. Strong correlations were observed with eosinophilia and elevated levels of immunoglobulin E and comments by GPs pertaining to allergies. Other correlations were associated with the presence of bacterial species and abnormal white blood cell counts.
- Digestive System Function and Bowel Toxicity and how these correlated with leaky gut, malabsorption pathology and liver metabolic dysfunction. . The data are presented in Table 3. The data strongly correlated with leaky gut syndrome and gut malabsorption and liver dysfunction. A moderate correlation was noted for elevated blood lipids.
- Fat Metabolism and how these correlated with blood lipids and liver dysfunction. The data are presented in Table 4. This data should be viewed in conjunction with that presented for Table 3. Strong correlations observed with elevated blood lipids.
- Liver Metabolic Function and blood lipids. The data are presented in Table 5. Here also the data should be viewed in conjunction with that presented for Tables 3 and 4. Strong correlations were observed with blood lipids and moderate correlations with blood proteins metabolism.
- Additional spreadsheets on LBA data were presented specifically for gallbladder function and protein metabolism and these are presented in Tables 6 and 7. Moderate correlations were observed with for blood lipids and blood proteins.

- **The Data:**

1. Live Blood Analysis and Red Blood Cell Morphology

   This Spreadsheet contained information on a total of 62 patients referred by 5 different General Practitioners to Australian Biologics for assessment with LBA.

   Table 1 lists a summary of the data provided.

Table 1 – LBA and RBC Specific Morphology Observed

Blood Cell Characteristic Observed with LBA	LBA No. (%)	Yes FBE – Pathology Normal	Yes FBE – Pathology Abnormal	No FBE – Pathology positive for characteristic
Anisocytosis	24 / 27 (89%)	7 / 9	6 / 6	11 / 12
Microcytosis	17 / 17 (100%)	9 / 9	3 / 3	5 / 5
Macrocytosis	17 / 20 (85%)	9 / 9	2 / 2	6 / 6
Poikilocytosis	13 / 20 (65%)	3 / 4	5 / 8	5 / 8
Elliptocytosis	16 / 22 (73%)	2 / 3	7 / 11	7 / 8
Target cells	17 / 20 (85%)	9 / 10	4 / 5	4 / 5
Acanthocytosis	5 / 5 (100%)	2 / 2	3 / 3	-
Schistocytosis	3 / 3 (100%)	2 / 2	-	1 / 1
Hypersegmented Neutrophils	1	1	-	-
Eosinophilia	1	1	-	-
L – forms	1	1	-	-

2. Live Blood Analysis and Immune Function

This Spreadsheet contained information on a total of 72 patients referred by 4 different General Practitioners to Australian Biologics for assessment with LBA.

Table 2 lists a summary of the data provided.

Table 2 – LBA and White Blood Specific Cell Morphology Observed

WBC Characteristic Observed with LBA	LBA No. (%)	GP / Path Comments Provided Patients (No)	Pathology Variable Provided Patients (No)
Leucocytes - normal range - low - elevated	65 / 72 47 / 65 (72%) 11 / 65 (17%) 7 / 65 (11%)	GPs: Depression (1) Allergies/Asthma (2) Immune deficit (1) Path: FBE normal (15) Abnormal WBC (8) Eosinophilia (5) Eosinophilia and Elevated IgE (3)	WBC count (12) Neutrophils (6) Lymphocytes (5) Eosinophils (8) IgA (1) IgE (8) C-Reactive Protein (1) HLA/DR (2) CD3 (4) $CD3^+$ $CD4^+$ (1) $CD3^+$ $CD4^+$ (1) $CD4^+$ $CD8^+$ (3) CD4 (3) CD8 (3) CD19 (2) B cells (1) NK cells (5) K. pneumoniae (1) C. freundii (1) P. aeruginosa (1) D. fragilis (1)
Hypersegmented Neutrophils	2 / 2 (100%)		
Eosinophilia - slight - moderate - severe	8 /72 6 2 -		
Leucocyte Viability - poor - good - hyperactive	61 / 72 6 / 61 (10%) 36 / 61 (59%) 3 / 61 (5%)		
Protoplasts	8 / 8 (100%)		
Artherosclerotic Plaques	1 / 1		

3. Live Blood Analysis and Digestive System Function and Bowel Toxicity

This Spreadsheet contained information on a total of 132 patients referred by 4 different General Practitioners and 3 Non Medical Practitioners to Australian Biologics for assessment with LBA.

Table 3 lists a summary of the data provided.

Table 3 – LBA and Blood Cell Gross Morphology and Crystal Precipitates Observed

Blood Cell Characteristic Observed with LBA	LBA No. (%)	AB / GP / Path Comments Provided Patients (No)	Pathology Variable Provided Patients (No)
Protein Linkage from RBC - none - slight - moderate - severe	41 (100%) 1 / 41 (2.5%) 11 / 41 (27%) 17 / 41 (41.5%) 12 / 41 (29%)	AB: Motile rods and cocci observed (65) Cholesterol crystals (6) Mucosal integrity changes (11) Path: Leaky gut (18) Malabsorption (6) Hepatitis (1) Bacterial gut flora problem (1)	Total cholesterol (21) Triglycerides (10) HDL (2) LDL/HDL (4) LDL (2) ALK Phos (3) ALT (6) AST (7) Total Protein (1) Apo b (1) Lip a (1) GGT (1) Globulin (7) LD (4) Bacteroides (3) Lactobacillus sp (3) E. coli (5) Enterococcus (3) α Haemolytic Strep (2) φ Haemolytic Strep (2) Strep sp (3) Bifidobacteria (3) Pseudomonas sp (2) P. aeruginosa (1) P. mirabilis (1) Klebsiella sp (1) Candida sp (5) Other microbes (10) % glutathionation % glucuronidation % glycination sulphate glucuronide (1) sulphation (1) Lactose recovery (7) Mannitol Recovery (16)
RBC Roleaux - none - slight - moderate - severe	28 (100%) 1 /28 (3.5%) 1 /28 (3.5%) 22 / 28 (78.5%) 4 / 28 (14%)		
Erythrocyte Aggregation - slight - moderate - severe	12 (100) 1 / 12 (8%) 9 / 12 (75%) 2 / 12 (17%)		
Thrombocyte Aggregation - slight - moderate - severe	44 (100%) 21 / 44 (48%) 17 / 44 (38.5%) 6 / 44 (13.5%)		
Spicule Formation - slight - moderate - severe	45 (100%) 14 (31%) 14 (31%) 17 (38%)		
Presence of Chylomicrons	10 / 10 (100%)		
Red Crystals	4 / 4 (100%)		
L – forms - slight - moderate - severe	81 (100%) 18 (22%) 42 (52%) 21 (26%)		

4. Live Blood Analysis and Fat Metabolism

   This Spreadsheet contained information on a total of 23 patients referred by 3 different General Practitioners to Australian Biologics for assessment with LBA.

   Table 4 lists a summary of the data provided.

Table 4 – LBA and Specific Platelet Morphology Observed

Platelet Morphology and Characteristic with LBA	LBA No. (%)	AB / GP / Path Comments Provided Patients (No)	Pathology Variable Provided Patients (No)
Thrombocyte Aggregation - slight - moderate - severe	11 (100%) 5 (45.5%) 4 (36.5%) 2 (18%)	AB: Low EFAs (1)	Sodium (1) Bicarbonate (2) Phosphate (2) Urea (1) Uric Acid (3) ALK phos (1) AST (1) ALT (3) Cholesterol (17) LDL (2) HDL (4) LD (1) Triglycerides (8) GGT (2) Globulins (1) Total Protein (2) $\phi 3 - \phi 6$ ratio (1) Saturated Fats (1)
Spicule Formation - slight - moderate - severe	16 (100%) 2 (13.5%) 5 (31.5%) 9 (56%)		
Presence of Chylomicrons	1 /1		

5. Live Blood Analysis and Liver Function

   This Spreadsheet contained information on a total of 100 patients referred by 4 different General Practitioners and 3 Non Medical Practitioners to Australian Biologics for assessment with LBA.

   Table 5 lists a summary of the data provided.

Table 5 – LBA and Specific Blood Cell Morphology and Precipitates Observed

Blood Cell Morphology and Precipitates Characteristics with LBA	LBA No. (%)	AB / GP / Path Comments Provided Patients (No)	Pathology Variable Provided Patients (No)
Target Cells - yes - no	13 (100%) 8 (61 5%) 5 (31.5%)	Path: Cholesterol Crystals (2) Hepatitis (1) Steatohepatitis (1)	Sodium (1) Potassium (1) Chloride (1) Bicarbonate (5) Phosphate (4) Urea (1) Uric Acid (6) HDL (4) LDL (4) VLDL (1) Triglycerides (20) Calcium (8) Bilirubin (4) Albumin (2) Alk Phos (10) GGT (11) AST (14) ALT (18) Globulin (14) Total Protein (4) Apolipo b (1) Lipo a (1) % glutathionation (1) % glucuronidation (1) % glycination (1) Homocysteine (3) Long chain FAs (1) Short Chain FAs (1)
Thrombocyte Aggregation - slight - moderate - severe	67 (100%) 31 (46%) 28 (42%) 8 (12%)		
Spicule Formation - slight - moderate - severe	79 (100%) 18 (23%) 30 (38%) 31 (39%)		
Presence of Chylomicrons - yes - no	7 (100%) 6 (86%) 1		

6. Live Blood Analysis and Gallbladder Function

This Spreadsheet contained information on a total of 14 patients referred by 2 different General Practitioners to Australian Biologics for assessment with LBA.

Table 6 lists a summary of the data provided.

Table 6 – LBA and Specific Blood Cell Morphology and Precipitates Observed

Characteristic	LBA No. (%)	AB / GP / Path Comments Provided Patients (No)	Pathology Variable Provided Patients (No)
Protein Linkage from RBC - none - slight - moderate - severe	5 (100%) - 3 2 -	No Comments Provided	Sodium (1) Total cholesterol (9) LDL (1) HDL (1) LDL/HDL (1) Bicarbonate (3) Phosphate (2) Uric Acid (1) ALP (1) LD (1) ALT (1) AST (2) Triglycerides (3)
Erythrocyte Aggregation - slight - moderate - severe	1 1 - -		
Thrombocyte Aggregation - slight - moderate - severe	8 2 6 -		
Spicule Formation - slight - moderate - severe	8 (100%) 2 3 3		
Presence of Chylomicrons	1		
Red Crystals	2		
L – forms - slight - moderate - severe	6 (100%) - 5 1		

7. Live Blood Analysis and Protein Metabolism

This Spreadsheet contained information on a total of 12 patients referred by 2 different General Practitioners to Australian Biologics for assessment with LBA.

Table 7 lists a summary of the data provided.

Table 7 – LBA and Specific Blood Cell Morphology and Precipitates Observed

Characteristic	LBA No. (%)	AB / GP / Path Comments Provided Patients (No)	Pathology Variable Provided Patients (No)
Protein Linkage from RBC - none - slight - moderate - severe	- 	No Comments	AST (2) Cholesterol (2) Total Protein (3) Bilirubin (1) Albumin (1)
Erythrocyte Aggregation - slight - moderate - severe	- 		
Thrombocyte Aggregation - slight - moderate - severe	2 1 1 -		
Spicule Formation - slight - moderate - severe	3 1 1 1		
Chylomicrons	1		