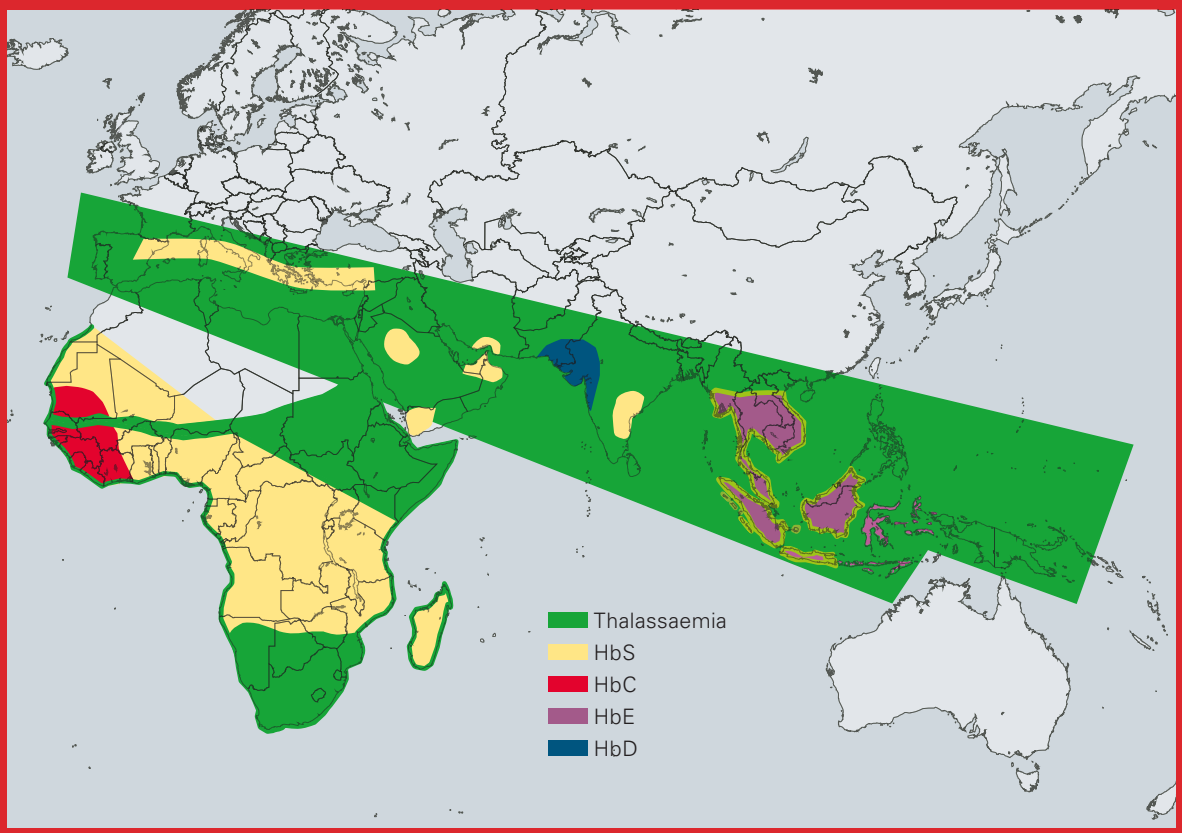
TOSOH

HLC-723G11
ß-THALASSAEMIA ANALYSIS MODE
THE ULTIMATE HAEMOGLOBINOPATHY SOLUTION FOR YOUR LAB

TOSOH BIOSCIENCE

Haemoglobinopathies are among the most common hereditary diseases of the world's population. About 4.5% of all human beings carry a gene for a thalassaemia or haemoglobin anomaly[1]. The areas in which such abnormalities were originally most common extend from Africa over the Mediterranean basin and the Near- and Middle East to Southeast Asia and the Indian subcontinent. Global migration in the modern period has led to a continual spread of these anomalies to all regions of the world, with the result that they are rapidly becoming more common in the industrialised regions of Northern and Central Europe as well[2].



Variants of thalassaemias and main abnormal haemoglobins interact to produce a wide range of clinical disorders of varying severity[3-4]. Homozygotes for ß-thalassaemia may develop either thalassaemia major or thalassaemia intermedia. Individuals with thalassaemia major are usually diagnosed within the first 2 years of life and require regular blood transfusions to survive[5].

LABORATORY DIAGNOSIS

Diagnosis of Beta-Thalassaemia and other types of haemoglobinopathies should be done based on clinical symptoms (if available) and a number of laboratory tests, such as MCV, MCH, total red cell count, HbF, HbA2 and iron markers.

TOSOH G11 BETA-THALASSAEMIA SOLUTION

- Quantitative determination of HbF and HbA_2 in 5 minutes
- Chromatographic separation between HbA_2 and HbE
- High resolution chromatogram thanks to Tosoh's over 40 years' experience in HPLC
- Full reagent traceability
- Easy to use and intuitive instrument
- Highly reliable system
- Instrument connectable to open laboratory automation lines

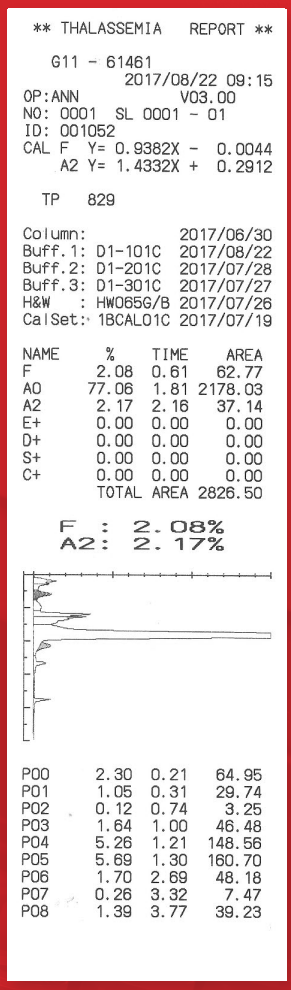
As a guideline, the below scheme can be used (Adapted from Mosca et at. J.Clin.Pathol. 2009 – with permission)

HbA_2	reduced < 2.3%			normal 2.3 - 3.5%				borderline 3.6 - 4.0%		increased 4.1 - 8.0%
MCV MCH	**reduced**	normal or **reduced**		normal				normal or	**reduced**	
RBC	normal or **reduced**	normal or **increased**	normal or **increased**		normal	normal or **reduced**	normal or **increased**		normal	normal **increased** or **reduced**	normal or **increased**
HbF	<1%	<1%	<1%	<1%	**3 - 16%**	<1%	<1%	**3 - 16%**	<1% or	<1% or	<1-8%
IRON MARKERS	**altered**	normal	normal	normal	normal	**altered**	normal	normal	normal	normal	normal
POSSIBLE DIAGNOSIS	iron deficiency	α-thal traits	δ or α-gene defects	**normal**	HPFH	iron deficiency	α-thal carrier Large β thal deletions	δ β thalassaemia γ δ β thalassaemia		Norm. HbA_2 β thal carriers α-gene triplications Hb variants with β or α-thalassaemia phenotype Some unstable Hb variants	High HbA_2 β thal carrier
MOLECULAR CONFIRMATION		α-Gap-PCR α or δ sequence α-MLPA			β-Gap-PCR γ-sequence β-MLPA		Gap-PCR α or δ sequence α and β-MLPA		β-Gap-PCR γ-sequence β-MLPA	β or α-sequence α-Gap-PCR α-MLPA	β-sequence

MLPA: Multiplex ligation-dependent probe amplification

- Software to assist in the interpretation of chromatograms
- Tosoh Bioscience offers an on-line clinical interpretation platform under the supervision of highly knowledgeable experts in the field

Example chromatograms: Normal, ß-Thalassaemia trait, HbS trait, HbE trait



** THALASSEMIA REPORT **

G11 - 61461
2017/08/22 09:15
OP:ANN V03.00
NO: 0001 SL 0001 - 01
ID: 001052
CAL F Y= 0.9382X - 0.0044
A2 Y= 1.4332X + 0.2912

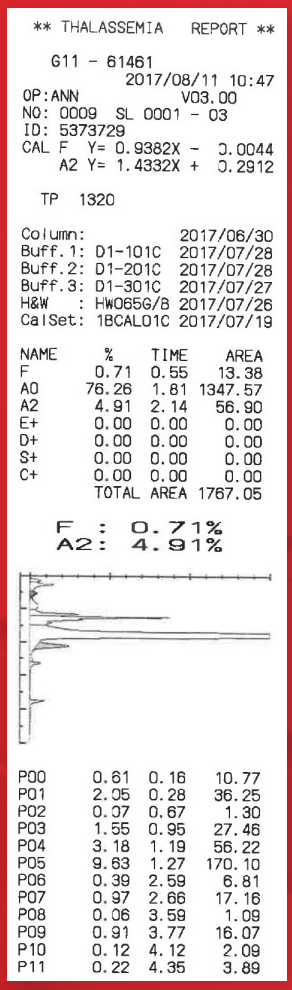
TP 829

Column: 2017/06/30
Buff.1: D1-101C 2017/08/22
Buff.2: D1-201C 2017/07/28
Buff.3: D1-301C 2017/07/27
H&W : HW065G/B 2017/07/26
CalSet: 1BCAL01C 2017/07/19

NAME	%	TIME	AREA
F	2.08	0.61	62.77
A0	77.06	1.81	2178.03
A2	2.17	2.16	37.14
E+	0.00	0.00	0.00
D+	0.00	0.00	0.00
S+	0.00	0.00	0.00
C+	0.00	0.00	0.00
	TOTAL	AREA	2826.50

F : 2.08%
A2: 2.17%

P00	2.30	0.21	64.95
P01	1.05	0.31	29.74
P02	0.12	0.74	3.25
P03	1.64	1.00	46.48
P04	5.26	1.21	148.56
P05	5.69	1.30	160.70
P06	1.70	2.69	48.18
P07	0.26	3.32	7.47
P08	1.39	3.77	39.23



** THALASSEMIA REPORT **

G11 - 61461
2017/08/11 10:47
OP:ANN V03.00
NO: 0009 SL 0001 - 03
ID: 5373729
CAL F Y= 0.9382X - 0.0044
A2 Y= 1.4332X + 0.2912

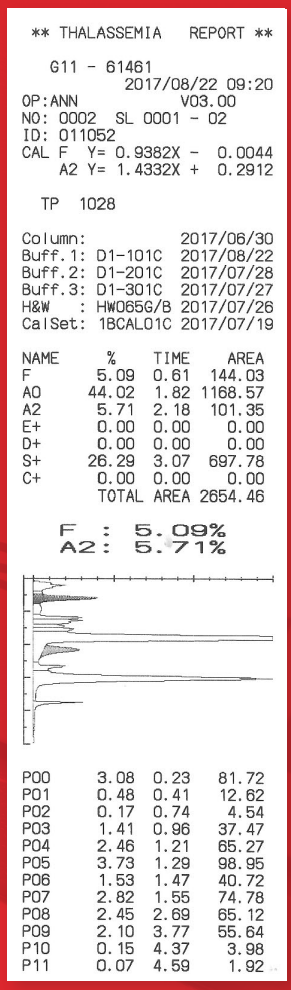
TP 1320

Column: 2017/06/30
Buff.1: D1-101C 2017/07/28
Buff.2: D1-201C 2017/07/28
Buff.3: D1-301C 2017/07/27
H&W : HW065G/B 2017/07/26
CalSet: 1BCAL01C 2017/07/19

NAME	%	TIME	AREA
F	0.71	0.55	13.38
A0	76.26	1.81	1347.57
A2	4.91	2.14	56.90
E+	0.00	0.00	0.00
D+	0.00	0.00	0.00
S+	0.00	0.00	0.00
C+	0.00	0.00	0.00
	TOTAL	AREA	1767.05

F : 0.71%
A2: 4.91%

P00	0.61	0.16	10.77
P01	2.05	0.28	36.25
P02	0.07	0.67	1.30
P03	1.55	0.95	27.46
P04	3.18	1.19	56.22
P05	9.63	1.27	170.10
P06	0.39	2.59	6.81
P07	0.97	2.66	17.16
P08	0.06	3.59	1.09
P09	0.91	3.77	16.07
P10	0.12	4.12	2.09
P11	0.22	4.35	3.89



** THALASSEMIA REPORT **

G11 - 61461
2017/08/22 09:20
OP:ANN V03.00
NO: 0002 SL 0001 - 02
ID: 011052
CAL F Y= 0.9382X - 0.0044
A2 Y= 1.4332X + 0.2912

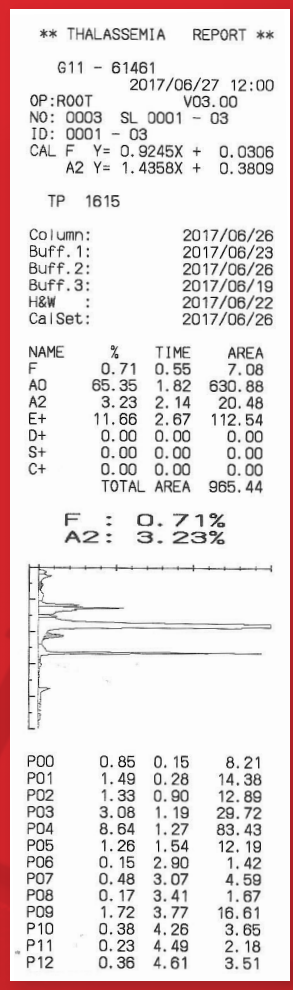
TP 1028

Column: 2017/06/30
Buff.1: D1-101C 2017/08/22
Buff.2: D1-201C 2017/07/28
Buff.3: D1-301C 2017/07/27
H&W : HW065G/B 2017/07/26
CalSet: 1BCAL01C 2017/07/19

NAME	%	TIME	AREA
F	5.09	0.61	144.03
A0	44.02	1.82	1168.57
A2	5.71	2.18	101.35
E+	0.00	0.00	0.00
D+	0.00	0.00	0.00
S+	26.29	3.07	697.78
C+	0.00	0.00	0.00
	TOTAL	AREA	2654.46

F : 5.09%
A2: 5.71%

P00	3.08	0.23	81.72
P01	0.48	0.41	12.62
P02	0.17	0.74	4.54
P03	1.41	0.96	37.47
P04	2.46	1.21	65.27
P05	3.73	1.29	98.95
P06	1.53	1.47	40.72
P07	2.82	1.55	74.78
P08	2.45	2.69	65.12
P09	2.10	3.77	55.64
P10	0.15	4.37	3.98
P11	0.07	4.59	1.92



** THALASSEMIA REPORT **

G11 - 61461
2017/06/27 12:00
OP:ROOT V03.00
NO: 0003 SL 0001 - 03
ID: 0001 - 03
CAL F Y= 0.9245X + 0.0306
A2 Y= 1.4358X + 0.3809

TP 1615

Column: 2017/06/26
Buff.1: 2017/06/23
Buff.2: 2017/06/26
Buff.3: 2017/06/19
H&W : 2017/06/22
CalSet: 2017/06/26

NAME	%	TIME	AREA
F	0.71	0.55	7.08
A0	65.35	1.82	630.88
A2	3.23	2.14	20.48
E+	11.66	2.67	112.54
D+	0.00	0.00	0.00
S+	0.00	0.00	0.00
C+	0.00	0.00	0.00
	TOTAL	AREA	965.44

F : 0.71%
A2: 3.23%

P00	0.85	0.15	8.21
P01	1.49	0.28	14.38
P02	1.33	0.90	12.89
P03	3.08	1.19	29.72
P04	8.64	1.27	83.43
P05	1.26	1.54	12.19
P06	0.15	2.90	1.42
P07	0.48	3.07	4.59
P08	0.17	3.41	1.67
P09	1.72	3.77	16.61
P10	0.38	4.26	3.65
P11	0.23	4.49	2.18
P12	0.36	4.61	3.51

References

1. Angastiniotis M, Vives Corrons J-L, Soteriades ES, Eleftheriou A. The Impact of Migrations on the Health Services for Rare Diseases in Europe: The example of Haemoglobin Disorders, in: The Scientific World Journal Volume 2013
2. Haemoglobinopathies on the move: Is Europe ready? Report by group of experts from the European Network for Rare and Congenital Anaemias (ENERCA) and the Thalassemia International Federation (TIF) in collaboration with the International Organization for Migration (IOM), Migration Health Division, Regional Office Brussels
3. Weatherall DJ, Clegg JB. 2001. The thalassaemia syndromes. 4th Edition. Oxford: Blackwell Science Ltd 2001
4. Thein SL. The molecular basis of ß-thalassemia. Cold Spring Harb Perspect Med. 2013 May 1;3[(5)]
5. Cao A, Kan YW. The prevention of thalassemia. Cold Spring Harb Perspect Med. 2013 Feb 1;3[(2)]

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