
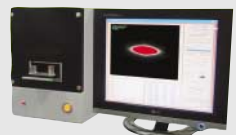



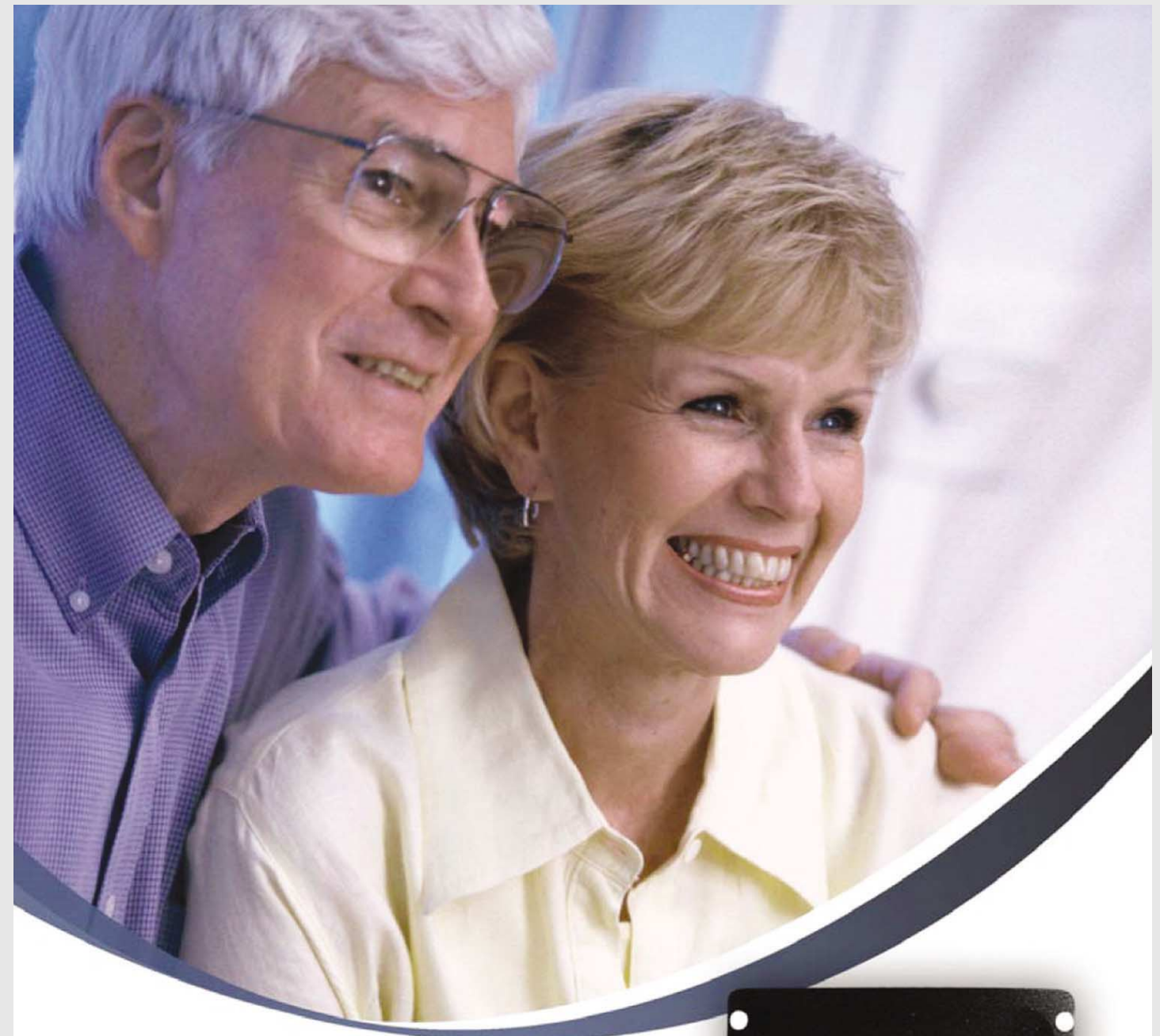
Toward to POC Hemorheology Test

● Specifications

Model	RheoScan-AnD 300			RheoScan-D 300		RheoScan-A
Image						
Measurement	Deformability	Aggregation-I	Aggregation-II	Deformability	Aggregation-I	Aggregation-II
Sample volume	6 μl	500 μl	8 μl	6 μl	500 μl	8 μl
Test time	30 s	20 s	120 s	30 s	20 s	120 s
Measuring Index	EI, SS _{1/2} , EI _{max}	τ_c (critical shear stress)	AI, M, t _{1/2} , t _{fast} , t _{slow}	EI, SS _{1/2} , EI _{max}	τ_c (critical shear stress)	AI, M, t _{1/2} , t _{fast} , t _{slow}
Operating mechanisms	Microfluidics, Laser diffraction	Microfluidics, Light backscattering	Micro-stirring, Light transmission	Microfluidics, Laser diffraction	Microfluidics, Light backscattering	Micro-stirring, Light transmission
Advantages	<ul style="list-style-type: none"> - Suitable for clinical applications (POCT) - No washing required after use - Quick & easy operation - Minimum blood sample volume 			<ul style="list-style-type: none"> - Quick test time - Disposable plastic microchip - High precision & reproducibility 		

● References

1. "Involvement of erythrocyte aggregation and erythrocyte resistance to flow in acute coronary syndromes," Clinical Hemorheol. Microcirc., 21(1999) 35-43
2. "Red blood cell (RBC) deformability, RBC aggregability and tissue oxygenation in hypertension," Clinical Hemorheol. Microcirc., 21 (1991)169-177
3. "A transient, microfluidic approach to the investigation of erythrocyte aggregation: The threshold shear-stress for erythrocyte disaggregation," Clinical Hemorheol. Microcirc., 42 (2009) 117-125
4. "Measurement of erythrocyte aggregation in a microchip stirring system by light transmission," Clinical Hemorheol. Microcirc., 41(2009) 197-207
5. "Progressive impairment of erythrocyte deformability as indicator of microangiopathy in type 2 diabetes mellitus," Clinical Hemorheol. Microcirc., 36(2007) 253-261
6. "Validation and application of a microfluidic ektacytometer (RheoScan-D) in measuring erythrocyte deformability," Clinical Hemorheol. Microcirc., 37(2007) 319-328



Innovative Diagnostic POC Technology of Blood Rheology



Rh

● RBC

Red blood cells (RBCs) are highly specialized cells that carry oxygen from the lungs to the tissue and allow carbon dioxide to move from the tissue to the lungs.

- Oxygen carrier
- Biconcave disk shape
- Tend to aggregate



● RBC Aggregation

RBC aggregation is one of key factors in determining blood flow resistance in the **micro-circulation**.

RBC aggregation is one of the major determinants of blood viscosity.

Increased RBC aggregation has been observed in various pathological diseases such as **cardiovascular diseases and microcirculatory diseases**.



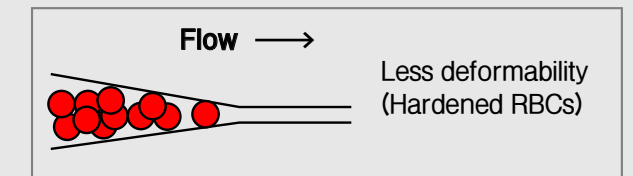
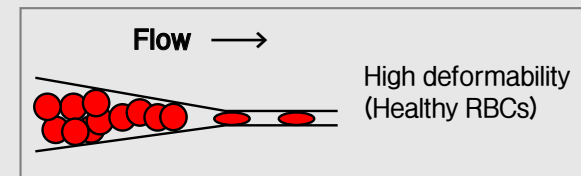
[Prof. H. Meiselman (USC)]

● Associated Pathologies : Cardiovascular Diseases

- Myocardial ischaemia
- Stroke
- Atherosclerosis
- Thrombotic disorders
- Hypertension
- Hypercholesterolemia

● RBC Deformability

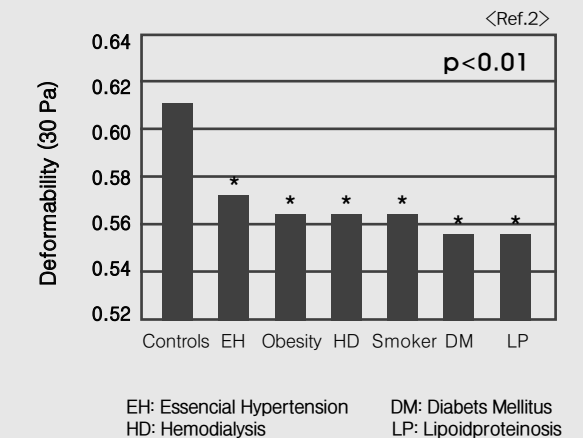
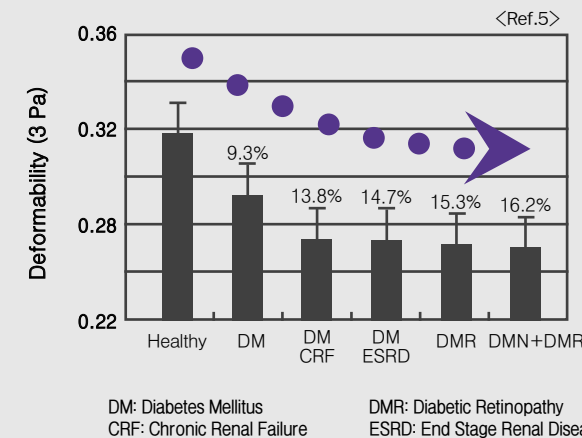
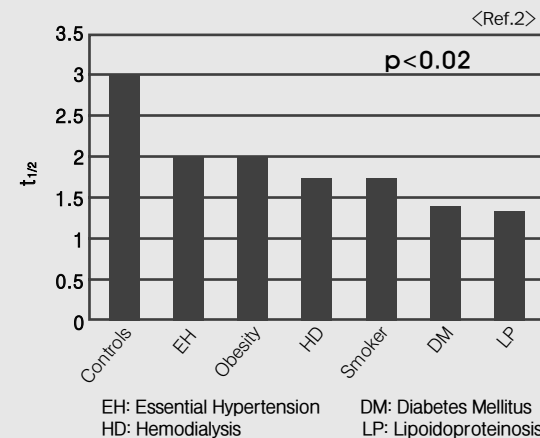
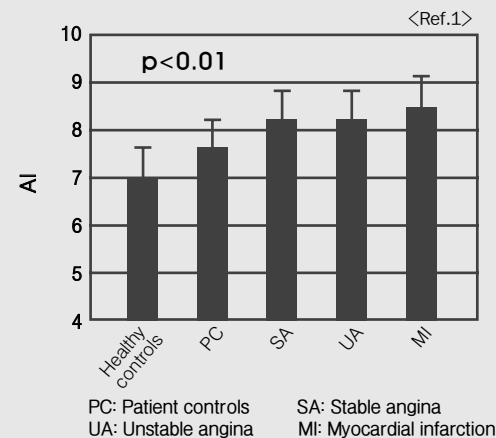
RBC deformability plays a critical role in blood circulation since they have to pass through capillaries whose diameter is smaller than their size. Impaired deformability of RBCs, which are observed in **diabetes mellitus**, can be used to **diagnose and monitor patients** at a risk for diabetic vascular complications at earlier stage.



→ Serious problems in microcirculation

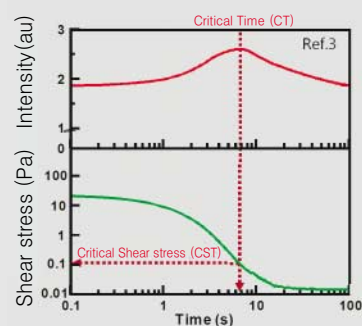
● Associated Pathologies: Microcirculatory Diseases

- Diabetes Mellitus
- Diabetic Complications
- Diabetic Retinopathy
- Diabetic Nephropathy
- Hypertension
- Hemodialysis
- Lipidproteinosis

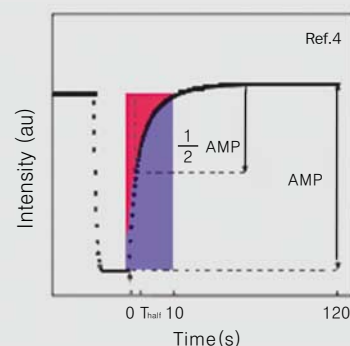


● Innovative Microchip Aggregometer

Aggregation Test-I : Critical shear stress (τ_c)



Aggregation Test-II : AI, M, $t_{1/2}$, t_{fast} , t_{slow}



● Innovative Microfluidic Diffractometer

