Specification of Plasma Fractionator Evaflux 5A

Model		5A10	5A20
Hollow fiber	Material	Ethylene vinyl alcohol copolymer	
	Inner diameter	175 μm	
	Wall thickness	40 μm	
Housing	Material	Polycarbonate resin	
	Membrane surface area	1.0 m^2	2.0 m^2
	Outer dimension	45 ϕ x 280 L mm	57 ϕ x 280 L mm
Priming volume	Outside hollow fibers	Approx. 85 mL	Approx. 108 mL
	Inside hollow fibers	Approx. 82 mL	Approx. 150 mL
Filled liquid		Sterile water	
Sterilization method		Gamma-ray irradiation	

5A10

5A20

Note

*Please read instructions carefully when using the product.

*Evaflux™ is a trademark of SB-KAWASUMI LABORATORIES, INC.

Distributed by

CE 0123

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KLE-EF5A-2301-02-FF

SB-KAWASUMI

Lipid Apheresis using Plasma Fractionator Evaflux™

For patients with hyperlipidemia refractory to conventional drug therapy

SB-KAWASUMI LABORATORIES, INC.

What is Familial Hypercholesterolemia (“FH”) ?

“FH” is an autosomal dominantly-inherited disease due to a congenital absence of low-density lipoprotein receptor (LDL-R) , that transports cholesterol-carrying lipoprotein particles into cells. A congenital absence of LDL-R results clinically in elevated concentrations of plasma LDL and cholesterol.

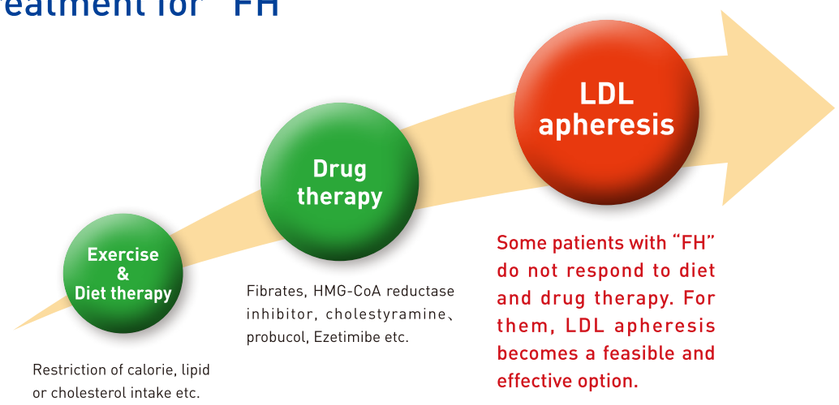
	Homozygous FH	Heterozygous FH
Pattern of Inheritance	Inheritance of the abnormal gene from both parents	Inheritance of the abnormal gene from one parent
Serum LDL-Cholesterol Levels	650-1,000 mg/dL	250-550 mg/dL
Frequency	Approx. 1 case per 1 million persons	Approx. 1 case per 500 persons

Common clinical signes of “FH”

1. Hypercholesterolemia
2. Tendon Xanthoma
3. Coronary Artery Disease

The patients with “FH” develop atherosclerosis at a young age due to the inefficient uptake of LDL by the liver and the denatured LDL which is deposited in blood vessel tissues.
In case of the patients with homozygous “FH”, **the early diagnosis and the treatment to lower LDL levels and treat other coronary risk factors** are very important because they are prone to premature atherosclerosis.

General treatment for “FH”



When should LDL apheresis commence?

FDA

- Functional **Homozygotes** with LDL >500 mg/dL
- Functional **Heterozygotes** with no known cardiovascular disease but LDL ≧ 300 mg/dL
- Functional **Heterozygotes** with known cardiovascular disease and LDL ≧ 200 mg/dL

Germany

- FH **Homozygotes**
- Patients with severe hypercholesterolemia with whom maximal dietary and drug therapy for > 1 year has failed to lower cholesterol sufficiently

UK

For patients who have failed prior treatment plans consisting of diet therapy and maximum drug therapy for at least 6 months

- FH **Homozygotes** in whom LDL is reduced by <50% and/or >9 mol /L (348 mg/dL) with drug therapy
- FH **Heterozygotes** or a “bad family history” with objective evidence of coronary disease progression and LDL >5.0 mmol /L (193 mg/dL) or decreases by <40% despite drug therapy
- Progressive coronary artery disease, severe hypercholesterolemia, and Lp(a) >60mg/dL in whom LDL remains elevated despite drug therapy

Spain

- FH **Homozygotes**
- **Heterozygotes** with symptomatic coronary artery disease in whom LDL is >4.2 mmol/L (162 mg/dL) or decreases by <40% despite maximal medical management

*Journal of Clinical Apheresis : Therapeutic Apheresis –Guidelines 2010

Double / Cascade Filtration Plasmapheresis

Double/ Cascade Filtration plasmapheresis is one of the LDL apheresis methods with the following principle.

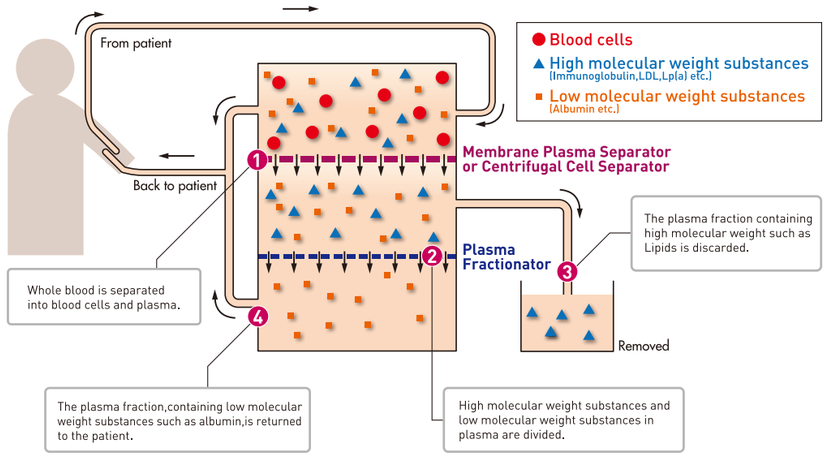
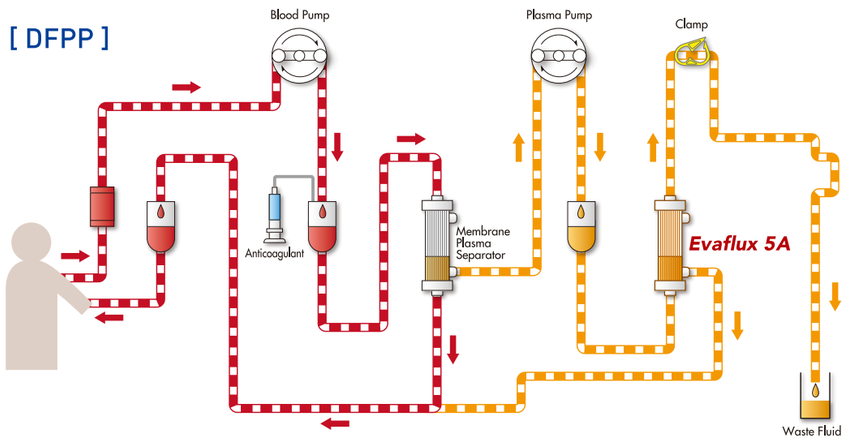


Fig 1: Principle of Double / Cascade Filtration
(Conceptual diagram was proposed by Prof.Agishi)

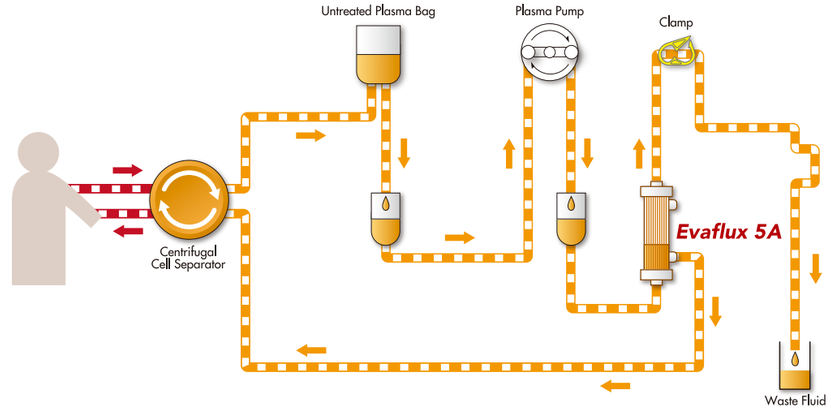
*Therapeutic Apheresis 4 (1):29-33, 2000

Flow Diagram of Double Filtration Plasmapheresis with Evaflux 5A



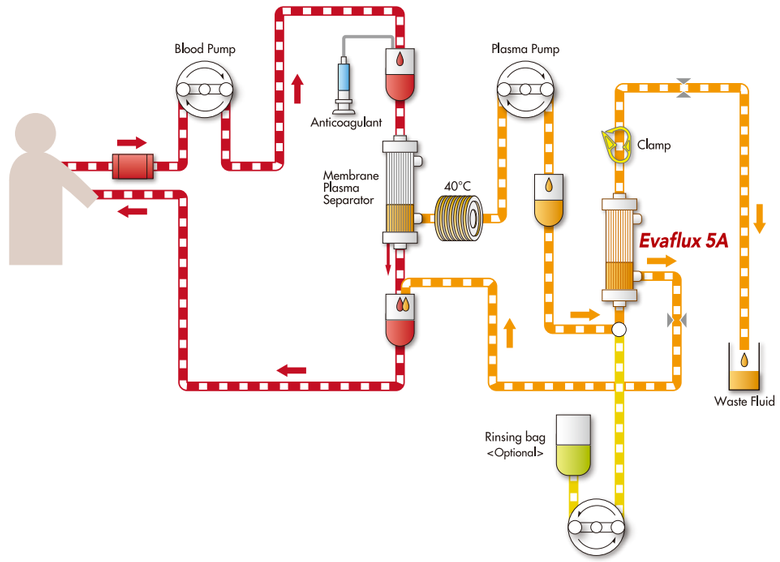
Flow Diagram of Cascade Filtration (CF) with Evaflux 5A

[in combination with Centrifugal Cell Separator]



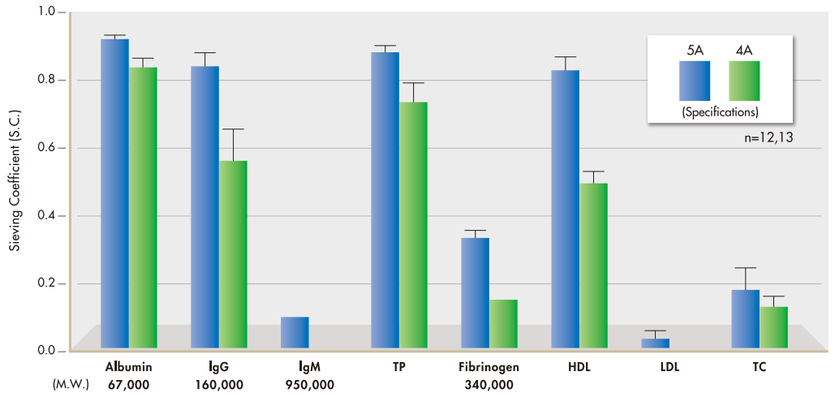
Flow Diagram of Thermo DFPP with Evaflux 5A

Plasma is warmed before being passed through Evaflux. Warming of the plasma would lower the plasma viscosity and sustain permeability of membrane.



Performance of DFPP

It is reported that DFPP using Evaflux 5A achieved the high removal rate of LDL , Lp(a) and fibrinogen, which are considered as the risk factors for arteriosclerosis.



S.C.is a parameter indicating the membrane permeability at a certain point.

Fig 2: Sieving Coefficient of "Evaflux"
(When 1,000 ml of plasma was processed)

- Evaflux 5A can remove LDL while allowing Albumin and HDL to be returned to the patient.
- Removal of high molecular weight proteins would contribute to the improvement of microcirculation.
- As Evaflux 5A returns most Albumin to the patient, it is rarely necessary to substitute Albumin during the procedure.

Removal rate of risk factors

Total cholesterol, LDL, Lp(a), and fibrinogen were removed by 60-80% after each session of DFPP treamtnet.

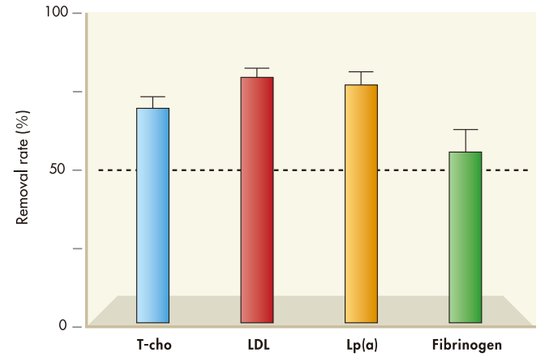


Fig 3: Removal Rate of Evaflux 5A
(When 4,000 ml of plasma was processed)

*Therapeutic Apheresis 2(3):224-227, 1998

Each patient was treated with DFPP at 2 weeks intervals for more than 3 years.

DFPP treatment lowers the risk factors and prevents the progression of atherosclerosis.