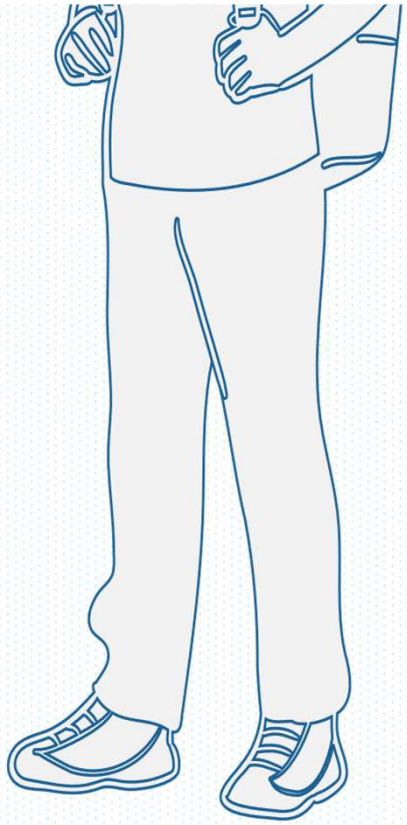
THE POWER OF

SMAT

THROMBO TRANSLATIONAL RESEARCH LAB 2025

FROM KUMAMOTO PREF. IN JAPAN

PRINCIPLE OF THE STATE-OF-THE-ART COAGULATION TEST "SMART ANALYSIS OF THROMBIN PRODUCTION : SMAT"



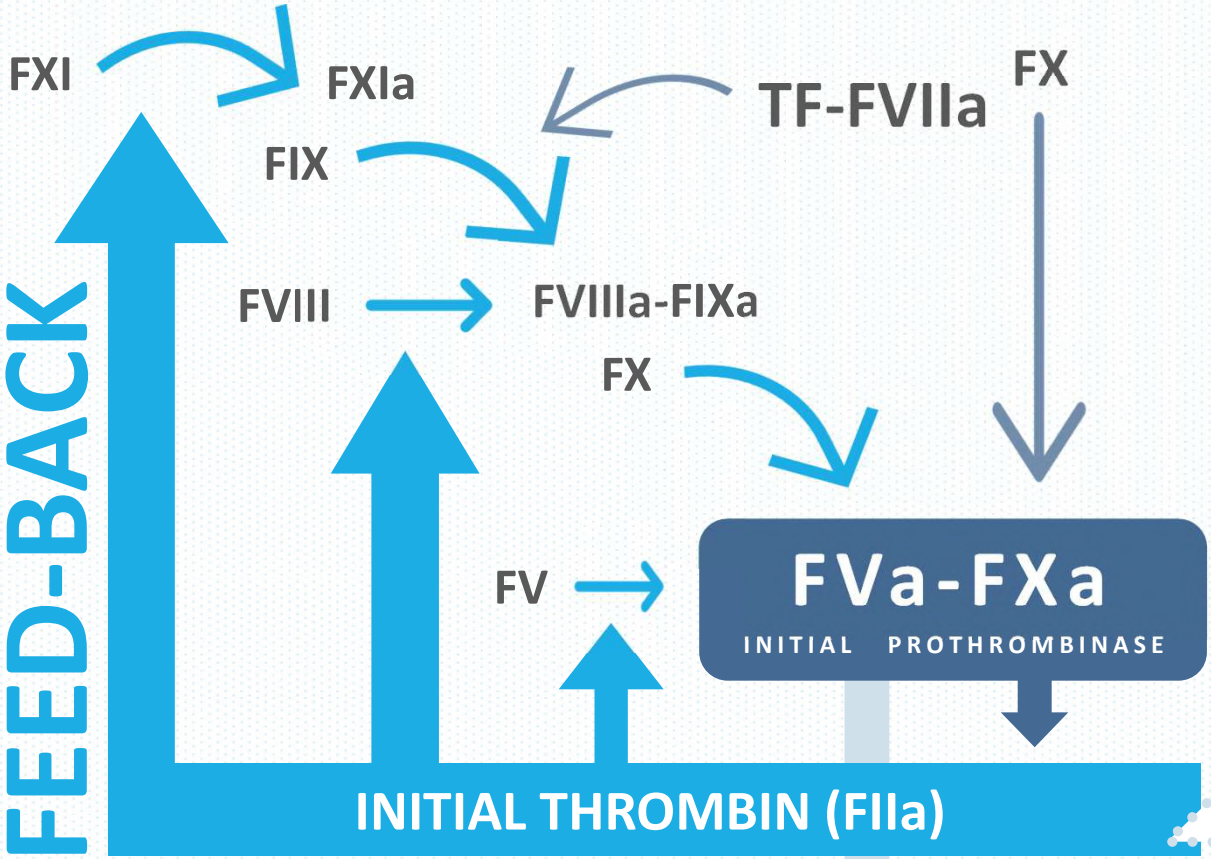
In the current scheme on coagulation mechanisms, the extrinsic pathway complex of tissue factor (TF) with FVIIa triggers a cascade of proteolytic reactions yielding FXa in the beginning phase of coagulation that forms the initial prothrombinase complex with FVa. The prothrombinase complex produces small amounts of the initial thrombin (FIIa) by its activation of prothrombin.

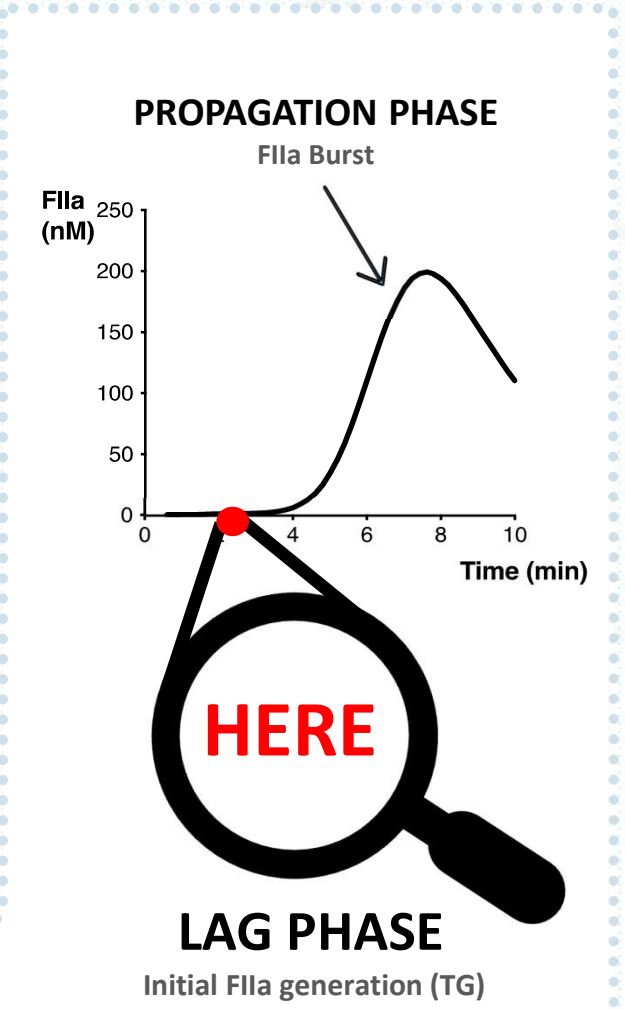
Notably, the initial FIIa exerts a central role in propagating the FIIa generation since the initial FIIa activates FV to FVa in a feedback loop. The initial FIIa also accelerates the intrinsic tenase complex (FVIIIa-FIXa)-driven FXa generation by activating FVIII and FXI to FVIIIa and FXIa, respectively, which the latter in turn activates FIX to FIXa.

Our state-of-the-art coagulation test called ***"Smart Analysis of Thrombin Production: SMAT"*** enables rapid and precise assessment of the initial FIIa generation in plasma, providing a novel tool for the prognosis and diagnosis of thrombotic and bleeding disorders.

TF PATHWAY-DRIVEN
INITIAL THROMBIN GENERATION

-SCHEMA OF TF PATHWAY-





FIIa BURST

REAGENT01

The SMAT-TF

The SMAT-tissue factor (TF) kit is a coagulaiton assay kit for assessing the TF coagulation pathway-driven initial FIIa generation in plasma independently of the FVIIIa/FIXa coagulation pathway.

In the assay, the initiator reagent including TF, phospholipids, and anti-FVIIIa inhibitory antibody is incubated with citrated plasma in the presence of calcium ion. After incubation, the FIIa generation is terminated with ethylenediamine tetraacetic acid (EDTA) solution and then fluorescence generated by FIIa cleavage of fluorogenic substrate is kinetically measured.

Intended Use:

- ✓ To evaluate abnormality in blood coagulation in patients with thrombotic and hemorrhagic disorders
- ✓ To investigate the association of cancer and infectious diseases with thrombosis
- ✓ To monitor anticoagulation drugs

REAGENT02

The SMAT-FVIII/IX

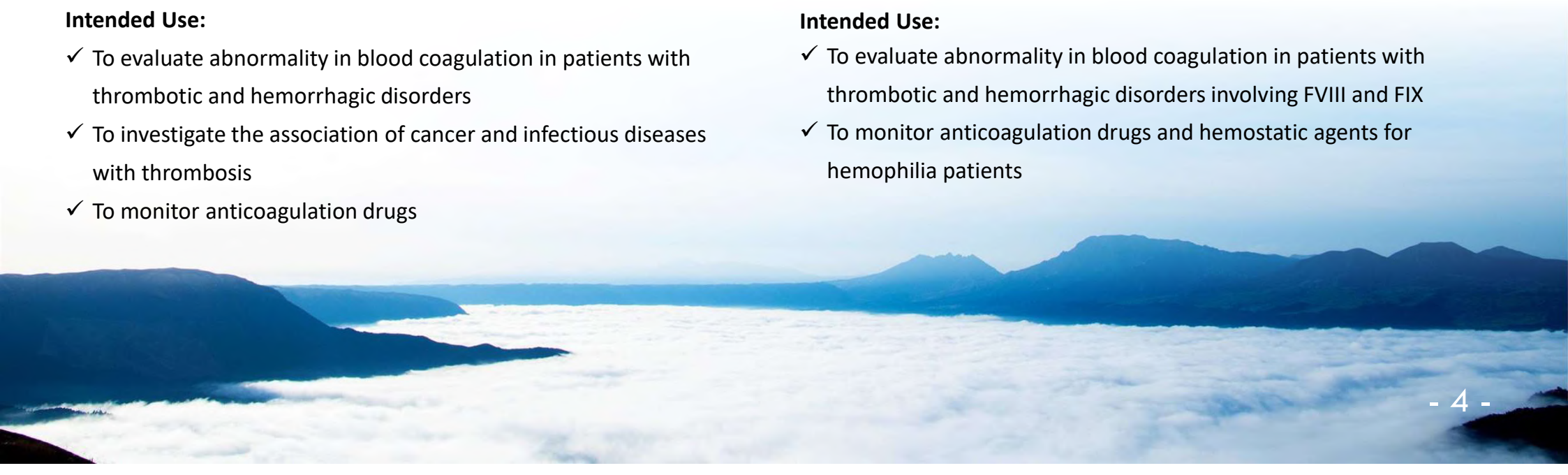
The SMAT-FVIII/FIX kit is a coagulation assay kit for the determination of initial FIIa generation in plasma induced by the intrinsic FVIIIa/FIXa complex. In principle, FVIIIa is produced in plasma by activation of FVIII via the TF-FVIIa coagulation pathway, while FIXa is produced by FXIa activation of FIX in plasma.

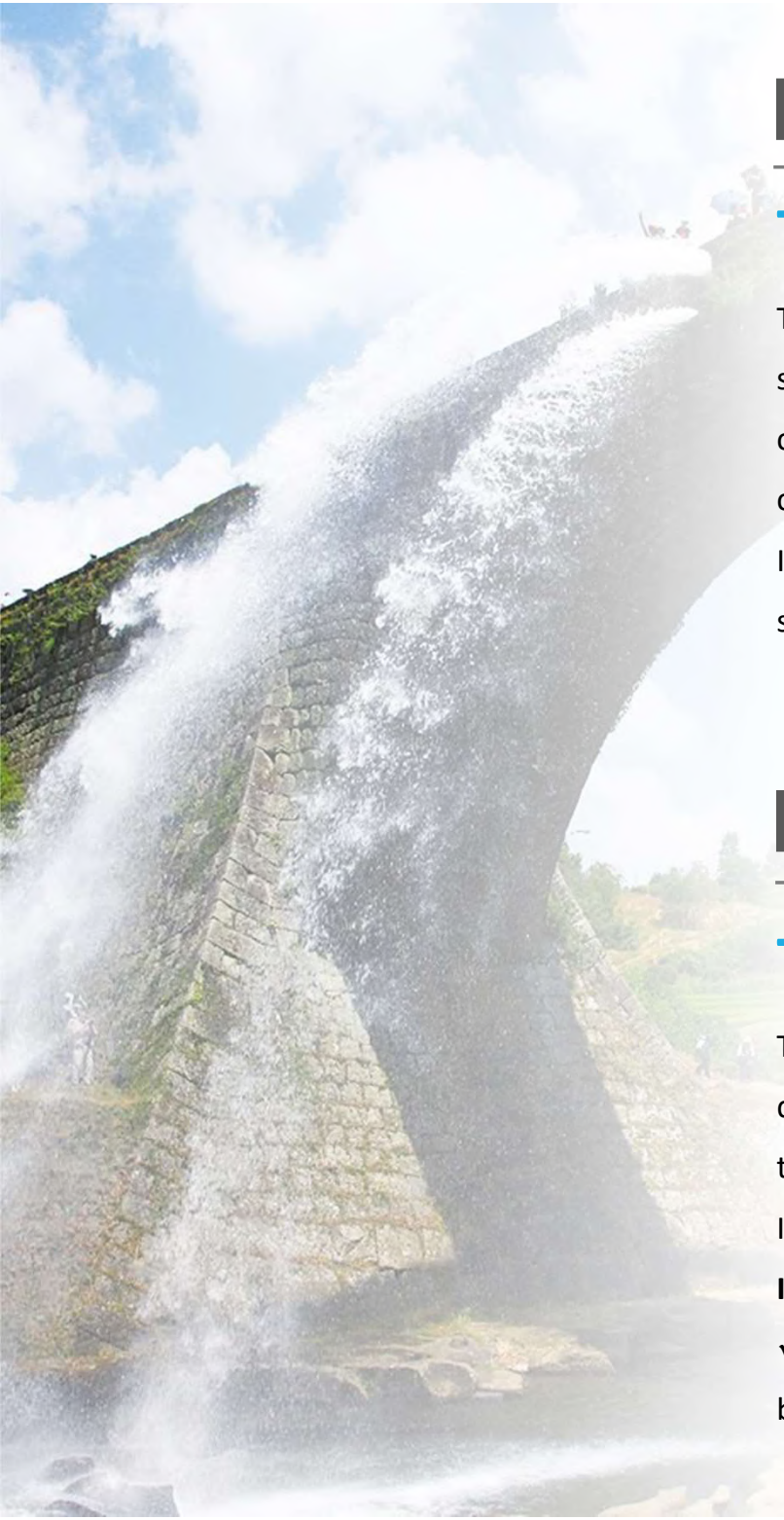
In the assay, the initiator reagent including TF, phospholipids, and FXIa is incubated with citrated plasma in the presence of calcium ion. After incubation, the levels of the initial FIIa generation are determined by kinetically measurung the generated fluorescence intensity through FIIa cleavage of fluorogenic substrate.

Reference: Blood. 130:1661-1670, 2017

Intended Use:

- ✓ To evaluate abnormality in blood coagulation in patients with thrombotic and hemorrhagic disorders involving FVIII and FIX
- ✓ To monitor anticoagulation drugs and hemostatic agents for hemophilia patients





REAGENT03

The SMAT-APCD

The SMAT-activated procoagulant detector (APCD) is a novel FIIa generation-based assay kit for screening of activated blood coagulation factors, coagulation initiators, coagulation stimulators, coagulation inhibitors in biofluids such as blood/plasma, urine, and conditioned media from cultured cells.

In the assay, the initiator reagent including phospholipids is incubated with recalcified plasma samples. After incubation, the levels of the initial FIIa generation are determined.

REAGENT04

The SMAT-TFPI

The SMAT-tissue factor pathway inhibitor (TFPI) is a novel FIIa generation-based assay for determination of TFPI anticoagulant activity in plasma. TFPI controls the initial FIIa generation through inhibition of activation of FX and FV by the TF-FVIIa complex and FXa, respectively.

In the assay, TFPI activity in plasma is defined as an ability to inhibit the initial FIIa generation.

Intended Use:

✓ Use for assessment of the profile of plasma TFPI activity in patients with thrombotic and bleeding disorders

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THE ADVANCEMENT OF THROMBOSIS AND HEMOSTASIS FOR PATIENTS 2025

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