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Editorial

# Coagulation Disorders Beyond Technicalities

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## Editorial

The coagulation disorders have caught multidisciplinary attraction by the scientific community in the recent decades. There are several technicalities that hinder the pace of research. The research area demands highly specialized personals, proper technologies, techniques and methodologies. The conventional technologies and methods produce an extremely fewer pieces of information of issues and the research area suffers an infancy stage. Rationally speaking, the domain requires highly information oriented techniques to find the solutions to the clinical problems.

Majority of the anticoagulants in today's clinical laboratory inhibit the action of Factor Xa to certain extant. The determination of Factor Xa is crucial in routine clinical settings for practice and laboratories. The Xa monitoring keeps the fourth position in the standard assays, while the first three places are positioned by thromboplastin time (PT) [1-3] activated Partial Thromboplastin Time (aPTT) [4-6] and Thrombine Time (TT) [7] tests respectively. In reality, the test is not available in the hospitals and labourites everywhere even in developed countries. This is due to its tiresome nature, costly set ups and need of qualified or specialized staff.

PT is the first priority in clinical settings of innate coagulation disorders, dialysis, extensive surgery, or drugs having an inflammatory potency. For achieving an overview of the haemostatic system of patients, PT tests are combined with the tests for aPTT. PT assays give the information of the extrinsic part of the plasmatic coagulation system for instance coagulation Factor VII, and Factor X, V, II, while aPTT tests predict an isolated or a combined lack of the coagulation Factors of the intrinsic haemostatic cascade. The clinics suffer the deficiency of precise and accurate tests for monitoring of anticoagulants such as 'heparin' [8] or 'argatroban' [9] in human blood or plasma in surgical events. After one century since the first haemostatic test, clinics still require qualified personals for the PT or aPTT tests. ''Prothrombinase induced Clotting Time'' (PiCT) could be an alternative of aPTT, but it has not been recognized worldwide yet [10,11].

Research on thrombocytopenia is a key domain for the patients under the practice of anticoagulant therapy, but the area suffers challenges. For instance, the time-consuming and laborious step is the platelet isolation from the healthy donor's Platelet Rich Plasma (PRP) in Heparin Induced Thrombocytopenia (HIT) diagnosis tests. The laboratories for the HIT tests require highly experienced personals [12,13]. Every clinical case of HIT put a average of 9000 Euro of extra costs because of extended hospital stay by a patient and the requirement of costly alternative anticoagulants (Figure 1) [14].


**Figure 1:** Exemplary acoustic (QCM-D) instrument (www.3t-analytik.de).

Modern technologies and equipment for the haemostasis studies is a sign of hope for coping the technicalities and barriers. The equipments for supporting the Point Of Care (POC) settings could reduce the technical flaws of the routine haemostatic tests. For instance, acoustic technology has potential [15] due to its cost-effectiveness and uniqueness [16-18]. The technique keeps preeminent potential by applying the molecular imprinting, [19] biomedical engineering, miniaturization and sensor arrays [20].

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