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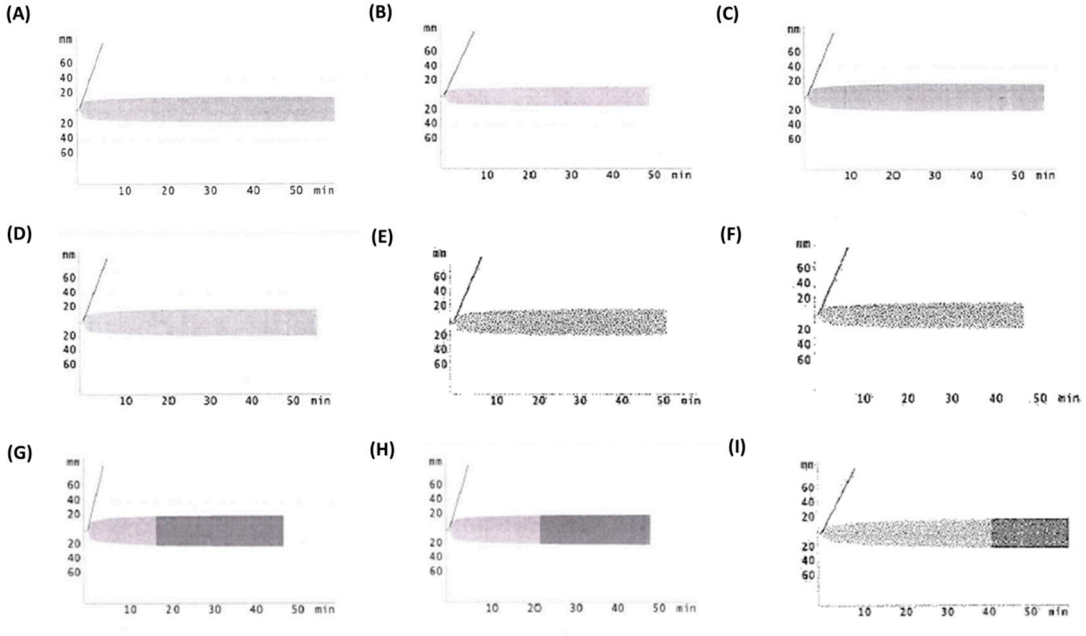
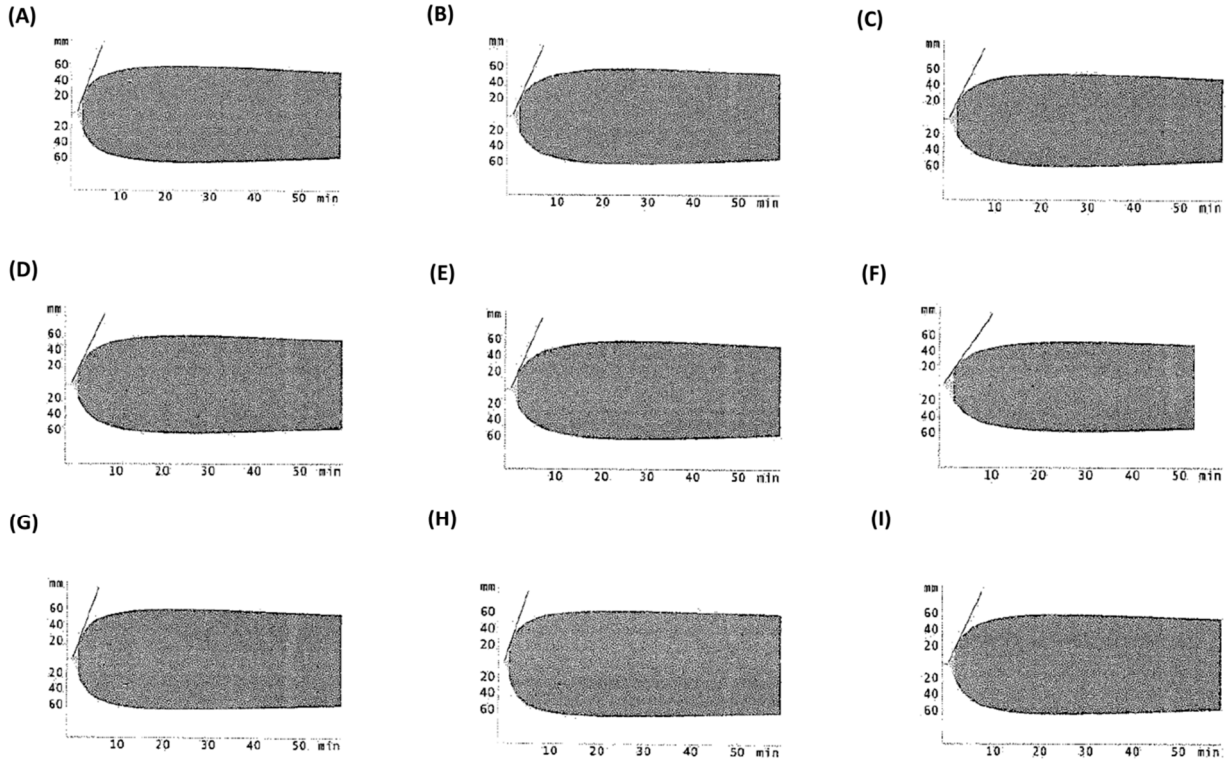
MDPI

**Supplementary Materials:**




**Supplemntary Figure 1.** The thromboelastogram resulted from citrated pool plasma spiked with (**A**) FA1, (**B**) FA2, (**C**) FA3, (**D**) FA6, (**E**) FA8, (**F**) FA12, (**G**) negative control sequence, (**H**) no aptamer and (**I**) tridegin to reach the final concentration of 2 μM for aptamers or tridegin. Plasma samples were spiked with aptamers, negative control sequence or tridegin and throboelastography was started by addition of 0.2 M $CaCl_2$ solution containing 6.25% recombinant tissue factor.

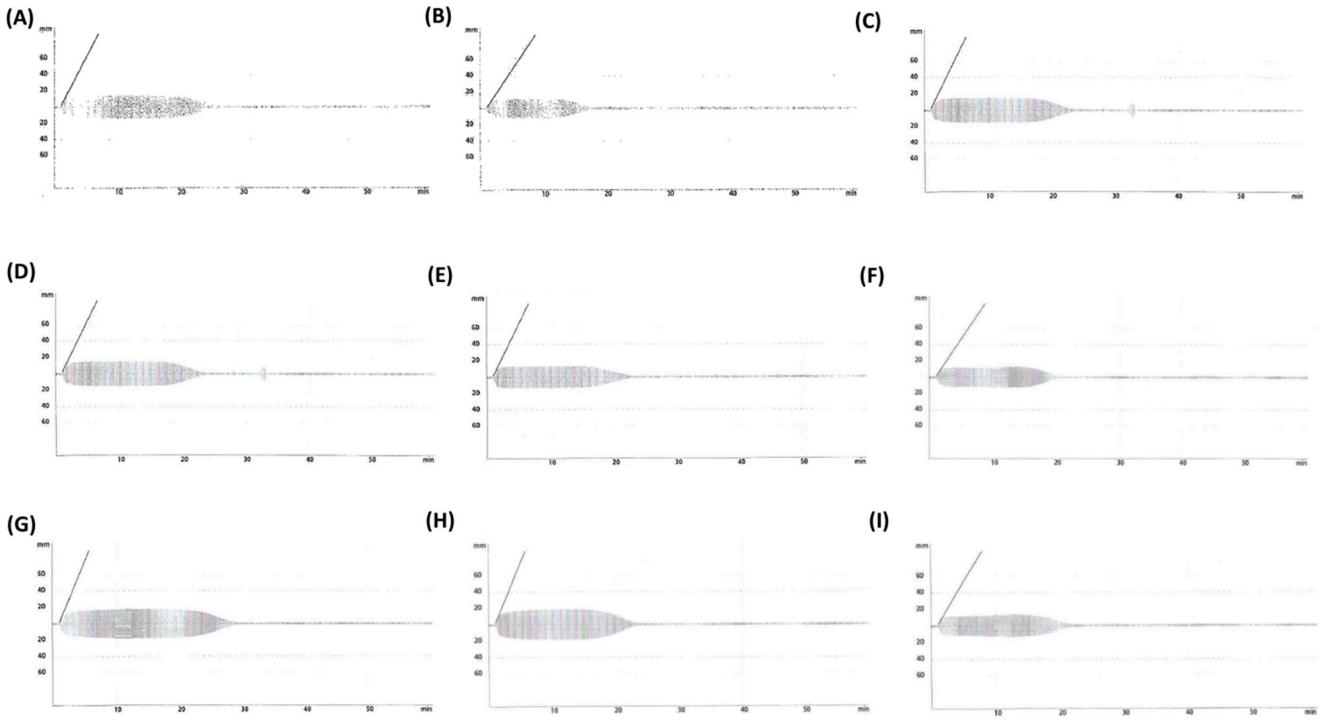



**Supplemntary Figure 2.** The thromboelastogram resulted from citrated blood spiked with (**A**) FA1, (**B**) FA2, (**C**) FA3, (**D**) FA6, (**E**) FA8, (**F**) FA12, (**G**) negative control sequence, (**H**) no aptamer and (**I**) tridegin to reach the final concentration of 2 μM for aptamers or tridegin. Throboelastography was started by addition of 0.2 M $CaCl_2$ solution containing 6.25% recombinant tissue factor.

**Supplementary Table 1.** Results of ROTEM analysis of citrated whole blood spiked with 2 μM of different aptamers or controls.

| | CT [s] | CFT [s] | MCF [mm] | A10 [mm] | A20 [mm] | MCE |
|---|---|---|---|---|---|---|
| **Whole blood** | 80.33 ± 6.67 | 60.67 ± 6.03 | 66.33 ± 1.15 | 61 ± 1 | 65.67 ± 0.58 | 197.26 ± 9.99 |
| **FA1** | 80.67 ± 0.58 | 66.67 ± 6.03 | 63.33 ± 0.58 | 57.67 ± 0.58 | 63.33 ± 0.58 | 172.77 ± 4.33 |
| **FA2** | 87.33 ± 1.53 | 84 ± 2.65 | 60 ± 1 | 53.67 ± 0.58 | 59.67 ± 0.58 | 150.1 ± 6.25 |
| **FA3** | 77.33 ± 2.52 | 91.33 ± 3.79 | 58.67 ± 1.15** | 52.33 ± 1.53* | 58.33 ± 0.58* | 142.06 ± 6.88** |
| **FA6** | 85.33 ± 8.5 | 79.33 ± 5.86 | 62.67 ± 0.58 | 56 ± 1 | 62.33 ± 0.58 | 167.9 ± 4.1 |
| **FA8** | 79.67 ± 7.5 | 108.33 ± 31.78* | 60 ± 2.65 | 51 ± 4.36** | 58.67 ± 3.21* | 150.71 ± 16.08 |
| **FA12** | 68.33 ± 3.85* | 109.66 ± 14.36* | 56.67 ± 0.58*** | 49.67 ± 1.53** | 56.33 ± 1.15*** | 130.8 ±3.05*** |
| **Tridegin** | 89.67 ± 3.75 | 88 ± 16.52 | 61.67 ± 1.53** | 55.67 ± 2.52 | 61.67 ± 1.53* | 161.14 ± 10.28** |
| **Neg. Ctrl.** | 87.33 ± 8.62 | 69.33 ± 3.79 | 63.33 ± 0.57 | 58 ± 1 | 63 ± 1 | 172.77 ± 4.33 |

CT, clotting time; CFT, clot formation time; MCF, Maximum clot firmness; A10, amplitude after 10 min; A20, amplitude after 20 min; MCE, maximum clot elasticity. Data are shown as mean ± SD of three independent measurements. All aptamers were compared to the negative control sequence whereat tridegin was compared to non-spiked whole blood using one-way ANOVA test. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

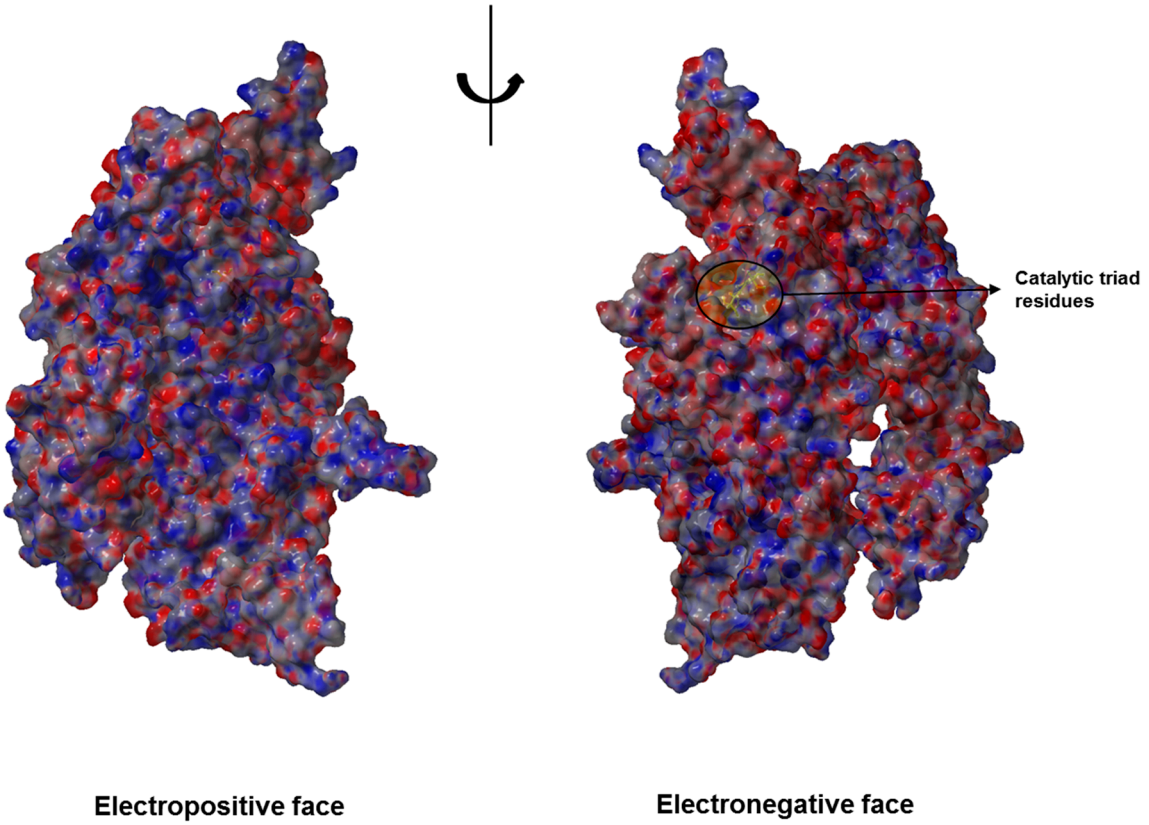



**Supplemntary Figure 3.** The thromboelastogram resulted from citrated pool plasma spiked first with 125 ng/mL tissue-type plasminogen activator and then with (**A**) FA1, (**B**) FA2, (**C**) FA3, (**D**) FA6, (**E**) FA8, (**F**) FA12, (**G**) negative control sequence, (**H**) no aptamer and (**I**) tridegin to reach the final concentration of 2 μM for aptamers or tridegin. Throboelastography was started by addition of 0.2 M $CaCl_2$ solution containing 6.25% recombinant tissue factor.

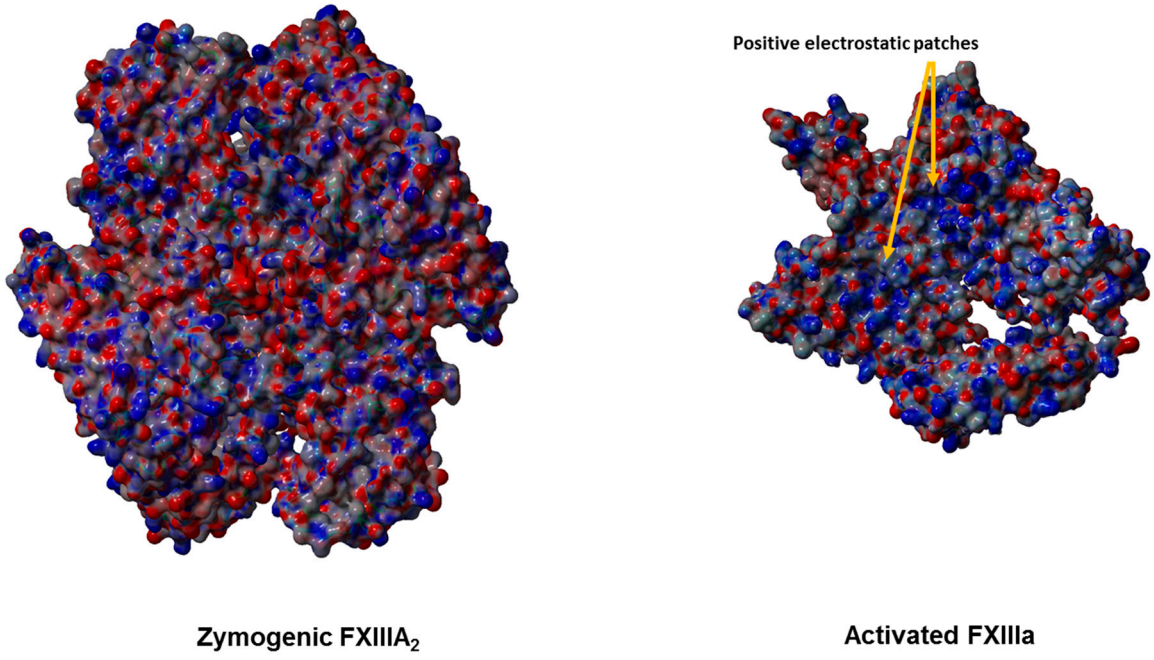
**Supplementary Table 2.** Results of ROTEM analysis of citrated pool plasma spiked with 125 ng/mL tissue-type plasminogen actiator and 2 μM of different aptamers or controls.

| | A20 | LI30[mm] | LOT |
|---|---|---|---|
| **Pool plasma** | 2.2 ± 3.34 | 1.2 ± 1.79 | 826.2 ± 153.8 |
| **FA1** | 4.0 ± 6.1 | 2.33 ± 2.5 | 875.67 ± 248.1 |
| **FA2** | 0 ± 0* | 0 ± 0* | 750 ± 123.45* |
| **FA3** | 9.5 ± 3.5 | 5.0 ± 4.24 | 1100 ± 86.27 |
| **FA6** | 1.67 ± 0.58 | 0.67 ± 0.58 | 903.33 ± 38.94 |
| **FA8** | 4.67 ± 5.0 | 2.33 ± 2.08 | 975.33 ± 162.5 |
| **FA12** | 3.0 ± 2.0 | 3.0 ± 4.36 | 943 ± 10.54 |
| **Tridegin** | 5.33 ± 2.1 | 1.33 ± 1.15 | 1004.67 ± 32.52 |
| **Neg. Ctrl.** | 12.33 ± 8.1 | 3.33 ± 3.06 | 1153 ± 179.55 |

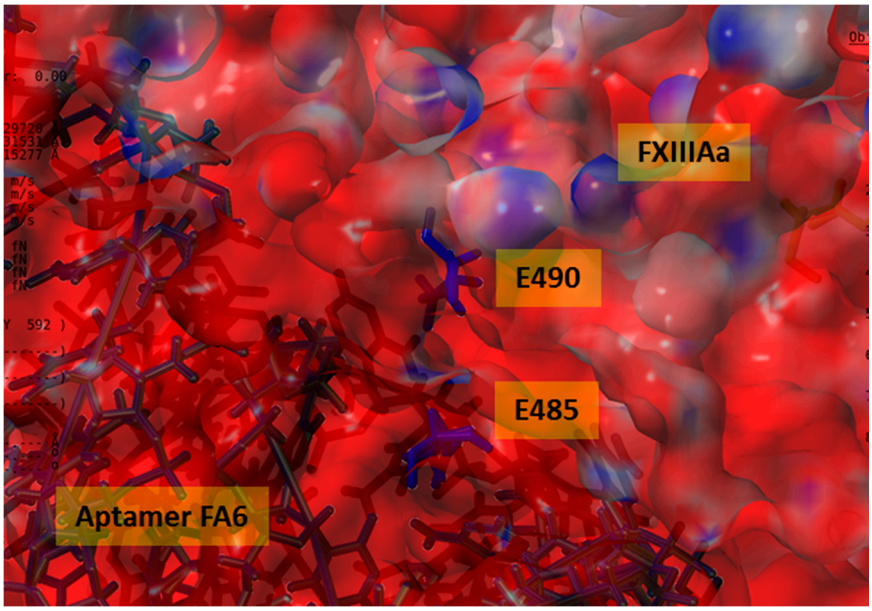
MCF, Maximum clot firmness; A20, amplitude after 20 min; MCE, maximum clot elasticity; LI30, fibrinolysis index after 30 min; LOT, lysis onset time. Data are shown as mean ± SD of three independent measurements. All aptamers were compared to the negative control sequence whereat tridegin was compared to non-spiked pool plasma using one-way ANOVA test. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.




**Supplementary Figure 4.** The image shows a PBS-based electrostatic surface representation of the FXIIIa structure from structurally reverse orientations. Red color indicates negative surface electrostatic potential, whereas blue represents positive potential.



**Supplementary Figure 5.** Zymogenic $FXIIIA_2$ vs. activated FXIII electrostatic surface. The zymogenic $FXIIIA_2$ (PDB ID: 1f13) and activated FXIIIa (PDB ID: 4kty) crystal structures are depicted by their PBS based electrostatic molecular surface representation. Red color indicates negative surface electrostatic potential, whereas blue color represents positive potential.




**Supplementary Figure 6.** A close-up view of the FA6 aptamer docking pose on FXIIIa. The aptamer is depicted in black stick format while on a PBS based molecular surface representation of FXIIIa is shown. Red color indicates negative surface electrostatic potential, whereas blue represents positive potential. The charged residues of calcium binding site 1 of FXIIIa are depicted in blue colored stick format [43].