**Supplementary informations**



**Fig. S1**: **Representative picture of shear-resistant firmly adhered Jurkat cells to hCMEC/D3 cells. TOP PANELS** Phase contrast pictures of confluent hCMEC/D3 cells stimulated with combination of cytokine (TNF + IFN) at 1 ng/ml for 24 h (RIGHT PANEL) or left unstimulated (LEFT PANEL). **BOTTOM PANELS** Fluorescent pictures (ex= 495, em= 521) of firmly adhered Jurkat T cells to hCMEC/D3 cells. Field of view (640 x 480 m).

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| **Parameter** | **Equation** | **Definitions** | **Unit** |
| **Shear rate ()** | = 8v d | **** = Shear rate**v**= Linear fluid velocity**d**= Inside diameter of the vessel | [1/s] |
| **Dynamic viscosity ()** (mu) | *F* =* A u*  *y*  | The magnitude***F*** of this force is found to be proportional to the speed ***u*** and the area ***A*** of each wall, and inversely proportional to their separation ***y***. | cP(centipoise)1cP= 1mPa s=[0.01dyn.s/cm2= (eta) |
| **Flow rate ()** |  = v⋅ | **V** = Velocity of the blood flowing**A** = Cross sectional vector of the vessel |  [ml/min] |
| **Shear stress ()** | =⋅ | Newtonian fluids flowing upon a planar surface**** = Shear stress****= Shear rate****= Dynamic viscosity | [dyn/cm2  |

**Table S1: Parameters to determine shear stress for vessel blood flow**. Assuming that the vessel is inelastic, cylindrical and straight, and, the blood is a Newtonian fluid and flow is laminar, the Haagen-Poiseuille equation indicates that the shear stress is directly proportional to blood shear rate and inversely proportional to vessel diameter. Shear stress () depends on shear rate () and dynamic viscosity (), which are related to the properties of the fluid, and the geometry of the vessel. Blood and water`s dynamic viscosities are 1.2 cP and 1 cP, respectively.

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| **Pulled thought Ibidi channel u-slide IV 0.4** | **Shear stress** | **Time (min)** |
| **Leukocyte in media** | 0.5 dyn/cm2 | 0.28 ml/min | 5 |
| **Media only** | 1.5 dyn/cm2 | 0.85 ml/min | 0.5 |

**Table S2: Parameters used for flow based adhesion in Ibidi channel u-slide IV 0.4.** Data about the geometry of the chamber can be found at www.ibidi.com.