Comparison between PDs: geometrical configuration, main components and the mechanical aortic valve used for the hydrodynamic tests. 
a) HER Pulse Duplicator: Pump (P), Ventricle Chamber (VC), Aortic Chamber (AC), Aortic Compliance (ACC), heater (H), systemic Compliance Chamber (CC), Peripheral Resistances (PR), Atrial Tank (AT). 
b) ViVitro CEL PD: SuperPump (P), Ventricle and Aortic Chamber (AC and VC), Atrium Chamber (AtC), Flow meter probe (F), Peripheral resistance controller (R). 
c) Bileaflet Mechanical Aortic Valve, On-X.
Pressure (in aorta and in ventricle) and flow measured at CO 4.0 l/min for (a) the HER Lab PD and (b) for CEL PD. Tested valve was On-X of size 25 mm. All data are averaged over 10 cycles.
Comparison between test results

- Differences were measured in terms of $\Delta P$ and EOA

The $\Delta P$ measured in HER Lab PD significantly differ from the one measured in Vivitro PD e.g.: for $CO 4.0 l/min$ $\Delta P$ is $2.4$ mmHg and $9.9$ mmHg for Vivitro and HER Lab PD, respectively

In this case the different set up of aorta compliance plays a fundamental role on the final outcomes, since the Vivitro PD worked with a compliant aortic root, whilst HER Lab PD considered a completely rigid aorta. The difference of compliance amplifies the $\Delta P$ and then the EOA.

For the present case, results give $EOA = 4.0$ cm$^2$ for Vivitro PD test and $EOA = 2.1$ cm$^2$ for HER Lab PD.

Standard requirements in terms of minimum EOA (equal to $1.25$ cm$^2$ for $25$ mm) are satisfied in both tests, BUT the ratio between measured and minimum EOA is much higher for Vivitro than for HER PD, depicting a much smaller hemodynamic performance for the same valve when tested at HER Lab.
Comparison between test results

- Absence of measured (volume of) leakage through the On-X valve into HER Lab PD!

Usually, mechanical valves exhibit mild leakage to promote leaflets washing thus preventing clots formations

**Possible explanation:** the absence of leakage may be due to a reduction of the transvalvular pressure gradient for the oscillating phenomena along the ventricular-flowmeter system that rise in the valve closing phase

To be investigated!