Qvanteq
smart medical technology.

Chandler Loop example:
Reduced Thrombogenicity with Qvanteq's QSTH Surface
Technology applied onto Neurovascular Stents

Kunze E., Rosenberger J.

December 20th, 2019
Arik Zucker, Stefano Buzzi

Experimental setup & method of dynamic human blood loop test

Test setup

- Flow loop model: Chandler loop
- Devices / run: Regular neurovascular stent vs. surface-treated stent per run and per donor
- Material: NiTi braiding; used for neurovascular stents
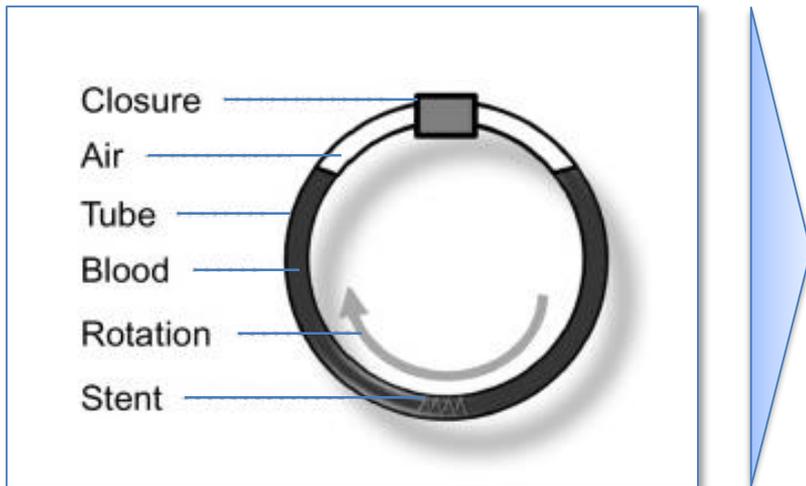
Test parameters

- Blood: human, freshly drawn (blood donation center Zurich; close proximity to Chandler Loop)
- Heparinization: 0.5 IU/ml
- Tube: Ø 4.75mm x 500mm
- Flow: 30 rpm
- Duration: 60 min
- Temp: 37°C
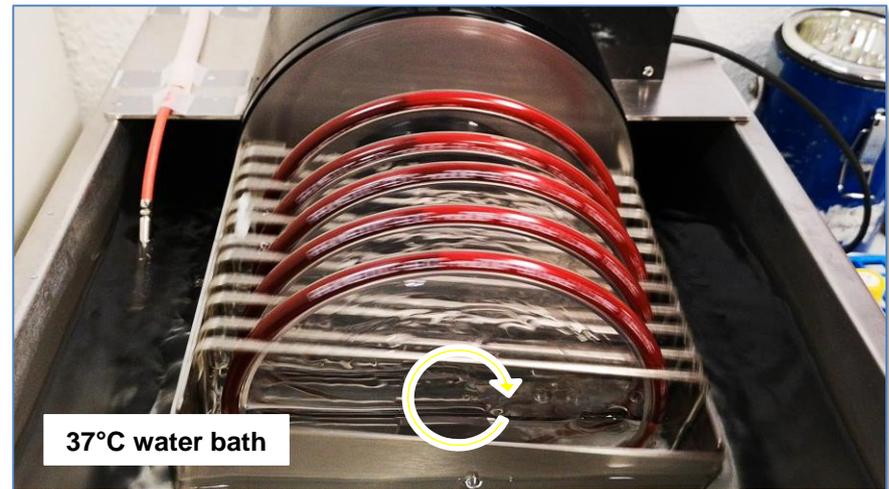
Analysis after runtime

- Blood extraction from loop tubes
  - Capturing **free-floating thrombi** (if present) with a filter
  - Determining **Thrombin-Antithrombin biomarker** to assess blood activation level difference between control & surface-treated stent, including also an empty tube as comparison
- Stent extraction from loop tubes rinsing in PBS and fixing adherent cells with PFA

Qvanteq

Working principle of dynamic human blood loop test

Loop tube

Chandler loop setup

37°C water bath

Source: Sperling C, et al. Hemocompatibility of Biomaterials for Clinical Applications, 2018

Qvanteq

QSTH surface technology significantly reduces blood activation (TAT) & thrombi

		NiTi Stent (control)			NiTi Stent + *QSTH* surface			TAT ratio: control vs. surface treated	Blood loop without stent TAT [ug/ml]
		Stent after flow loop run	Free-floating thrombi in blood loop	TAT [ug/ml]	Stent after flow loop run	Free-floating thrombi in blood loop	TAT [ug/ml]		
DYNAMIC **Human blood test in Chandler Loop**	Donor CL77			22.1			0.05	442	0.04
	Donor CL79			16.2			0.06	270	0.06
	Donor CL80			5.0			0.03	167	0.03
Avg ± Std				14.4			0.05	288	0.04

- *QSTH technology*
  - makes NiTi essentially "invisible" towards blood
  - mainly stent design influences thrombogenicity → hemodynamics

Kunze / Rosenberger

![Qvanteq – smart medical technology.]

For further enquiries, please contact:

Arik Zucker, CEO
arik.zucker@qvanteq.com
Phone: +41 (0)44 500 98 90
Mobile: +41 (0)79 786 69 19

Qvanteq AG
Technoparkstrasse 1
CH – 8005 Zürich
Switzerland