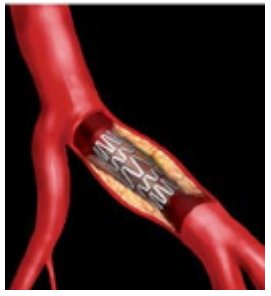
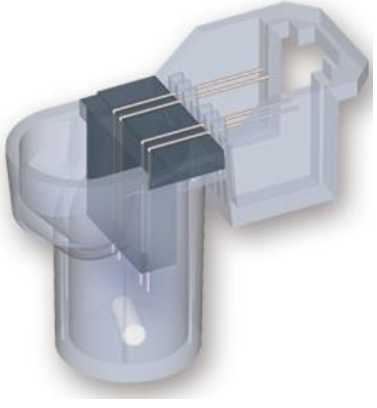
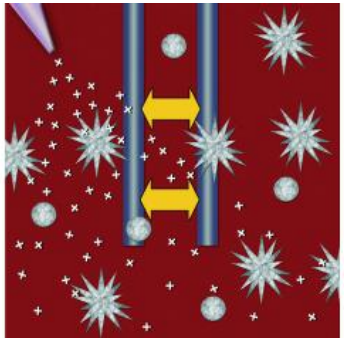
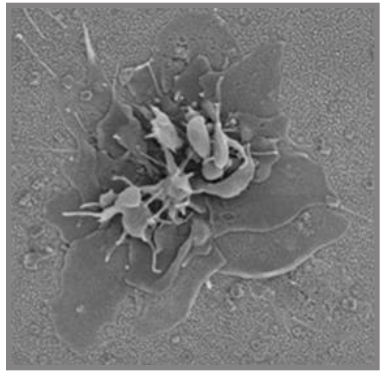


# Multiple Electrode Aggregometry (MEA - Multiplate) device demo

*Andreas Calatzis*
*Institute for Prevention of Cardiovascular Diseases*
*University of Munich*

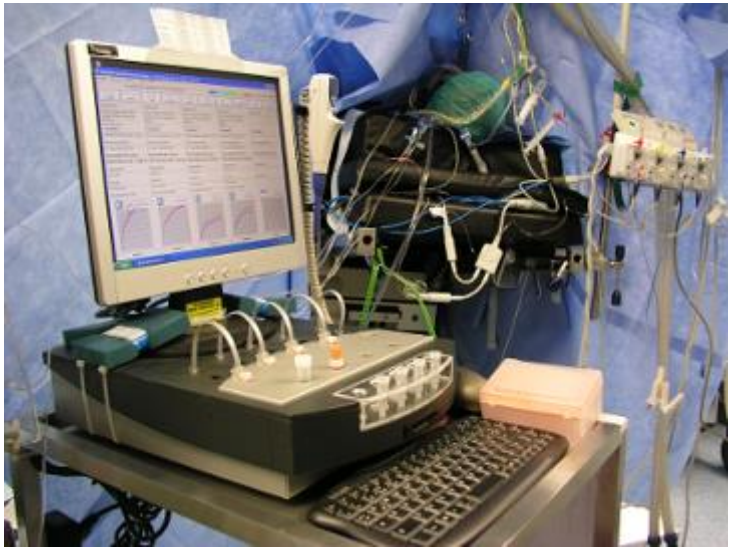






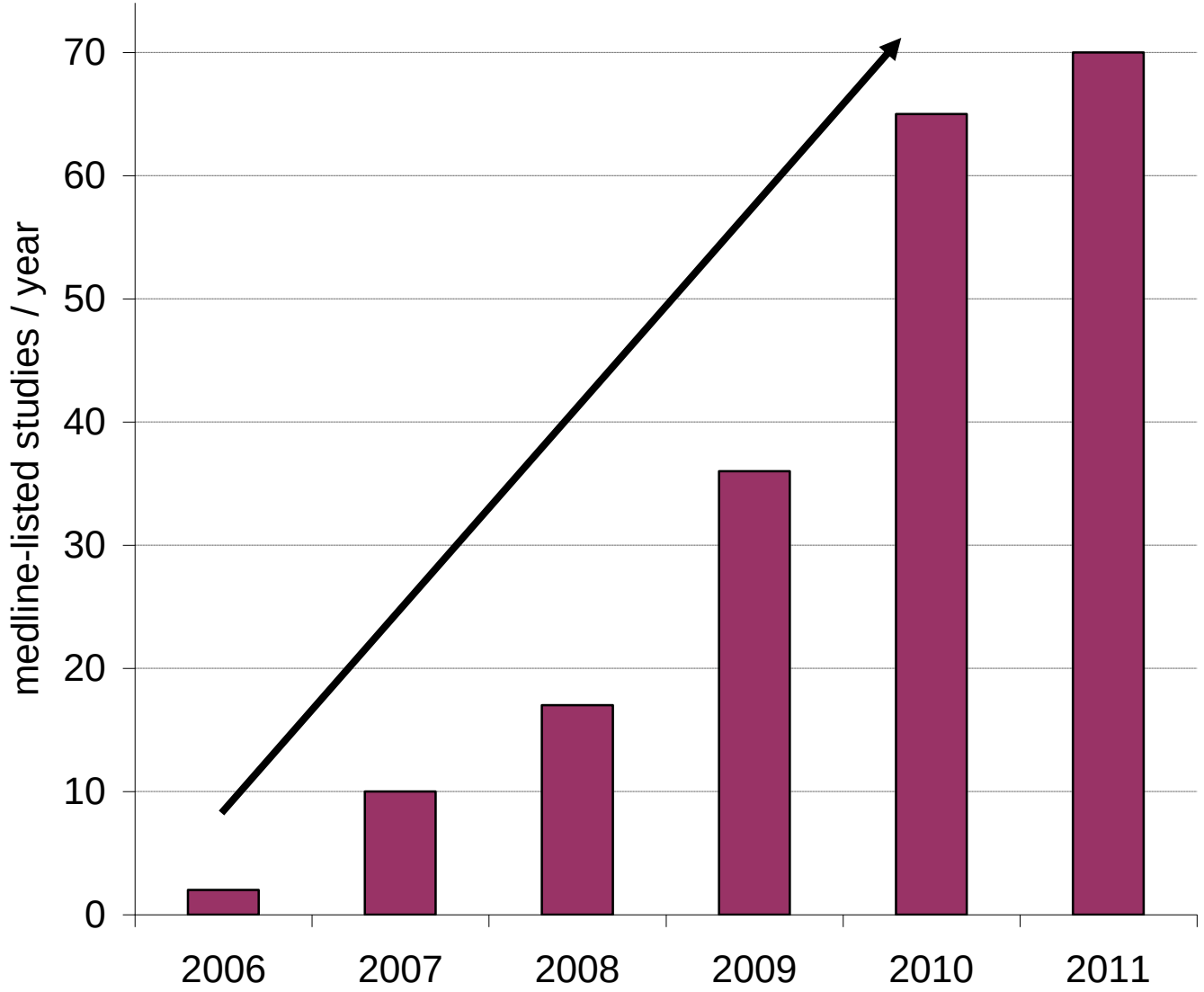
# Multiplate®
# analyzer

- platelet function analysis in whole blood
- 5 channels for parallel tests
- electronic pipetting
- applicable for laboratory and near patient analysis



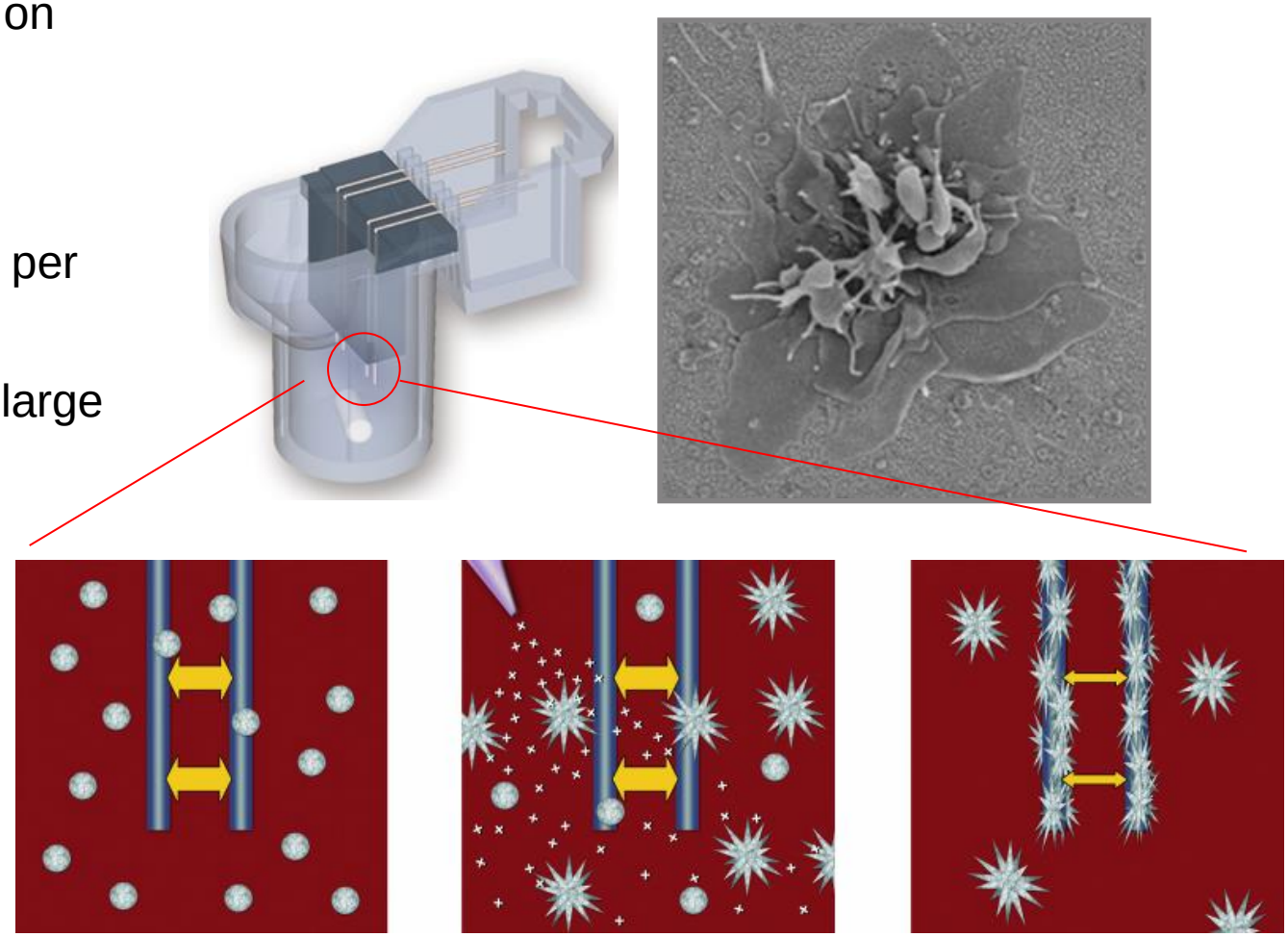
**Multiplate Analyzer**

**> 200 medline-listed publications**

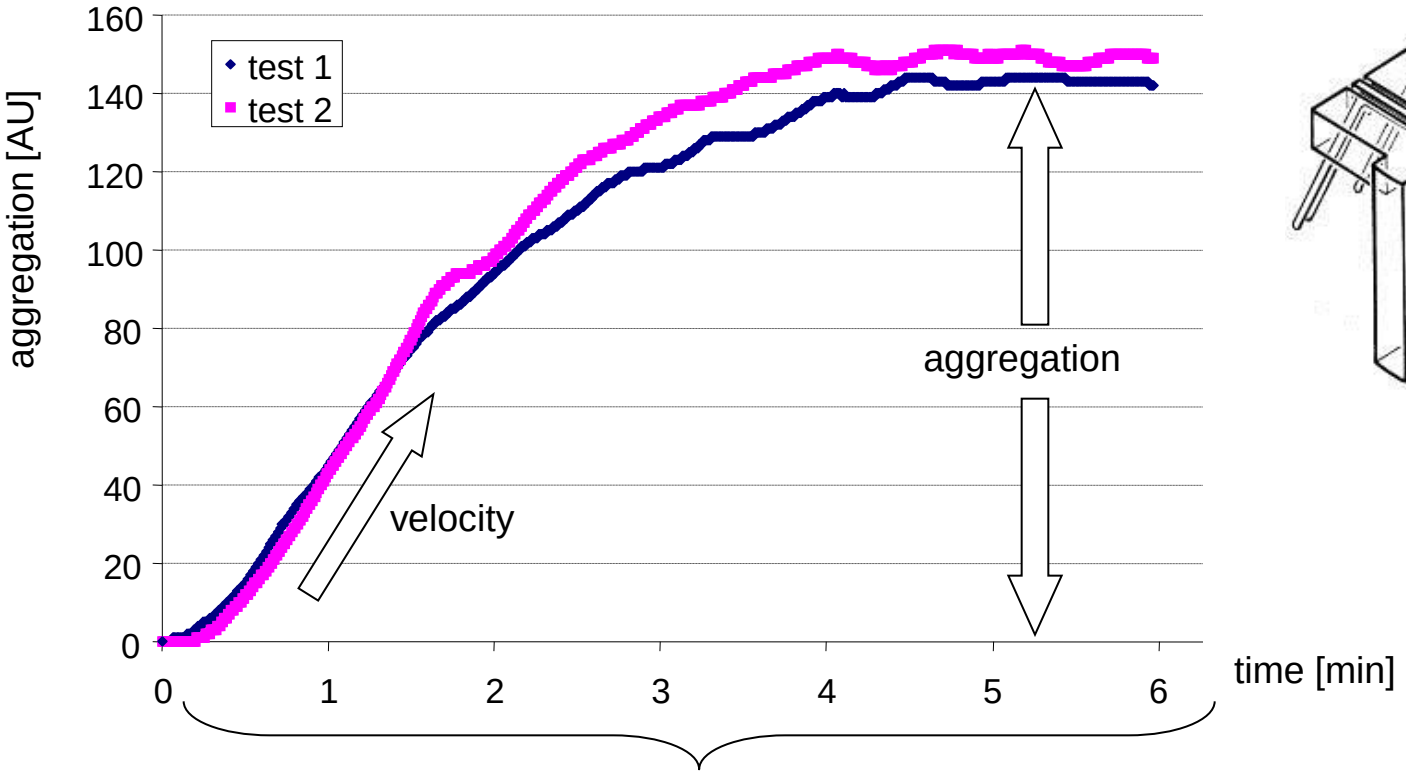


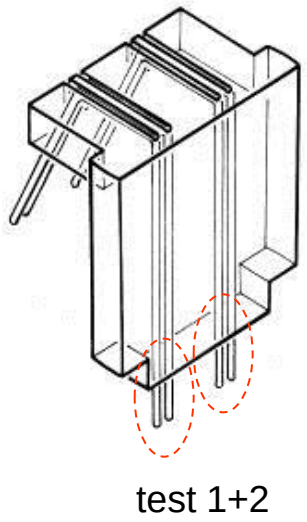
# Multiplate®
## Detection principle

- platelets aggregate on metal sensors and increase electrical resistance
- only 0.3 ml of blood per test
- high sensitivity and large dynamic range



# Multiplate
## Parameters



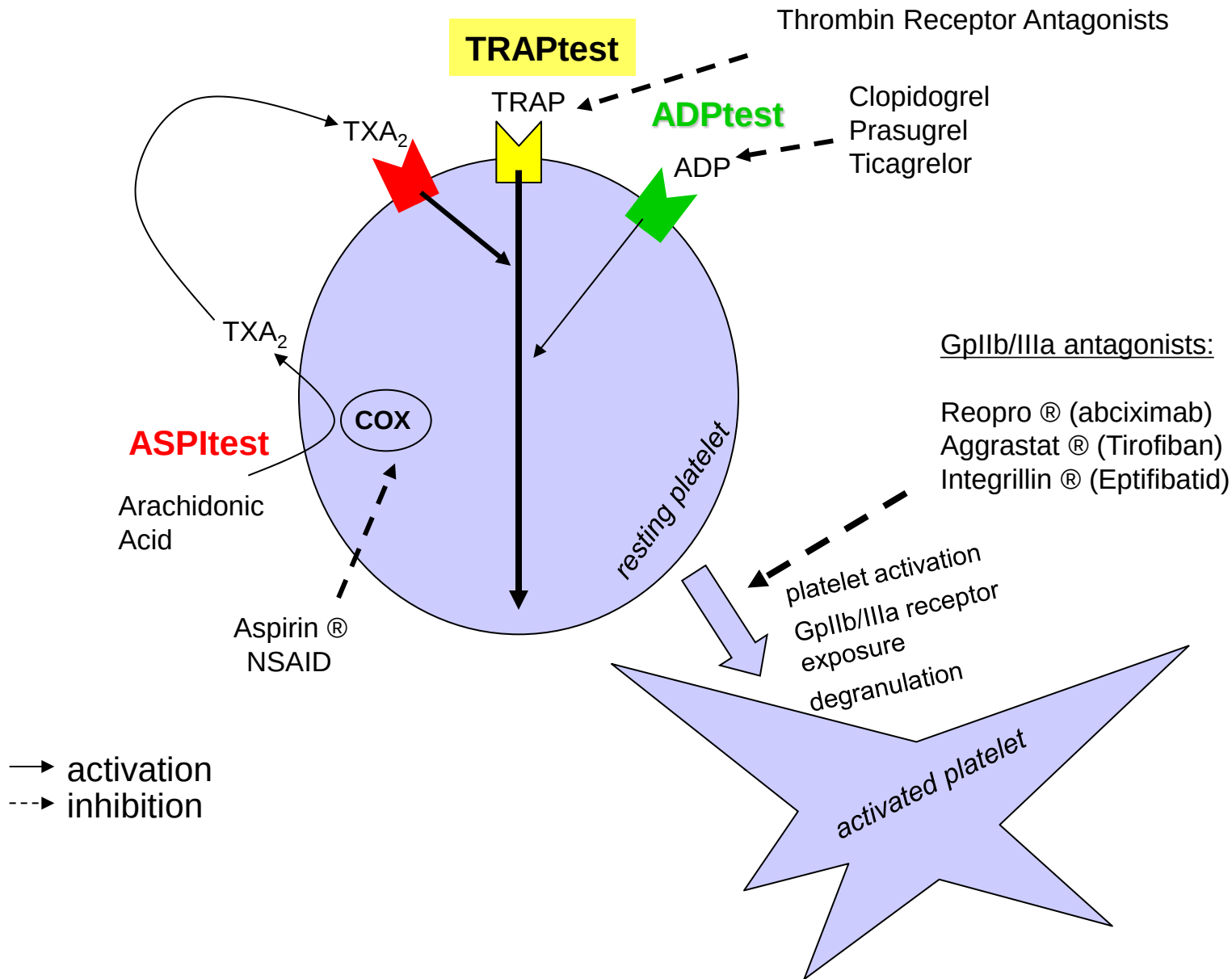



test 1+2

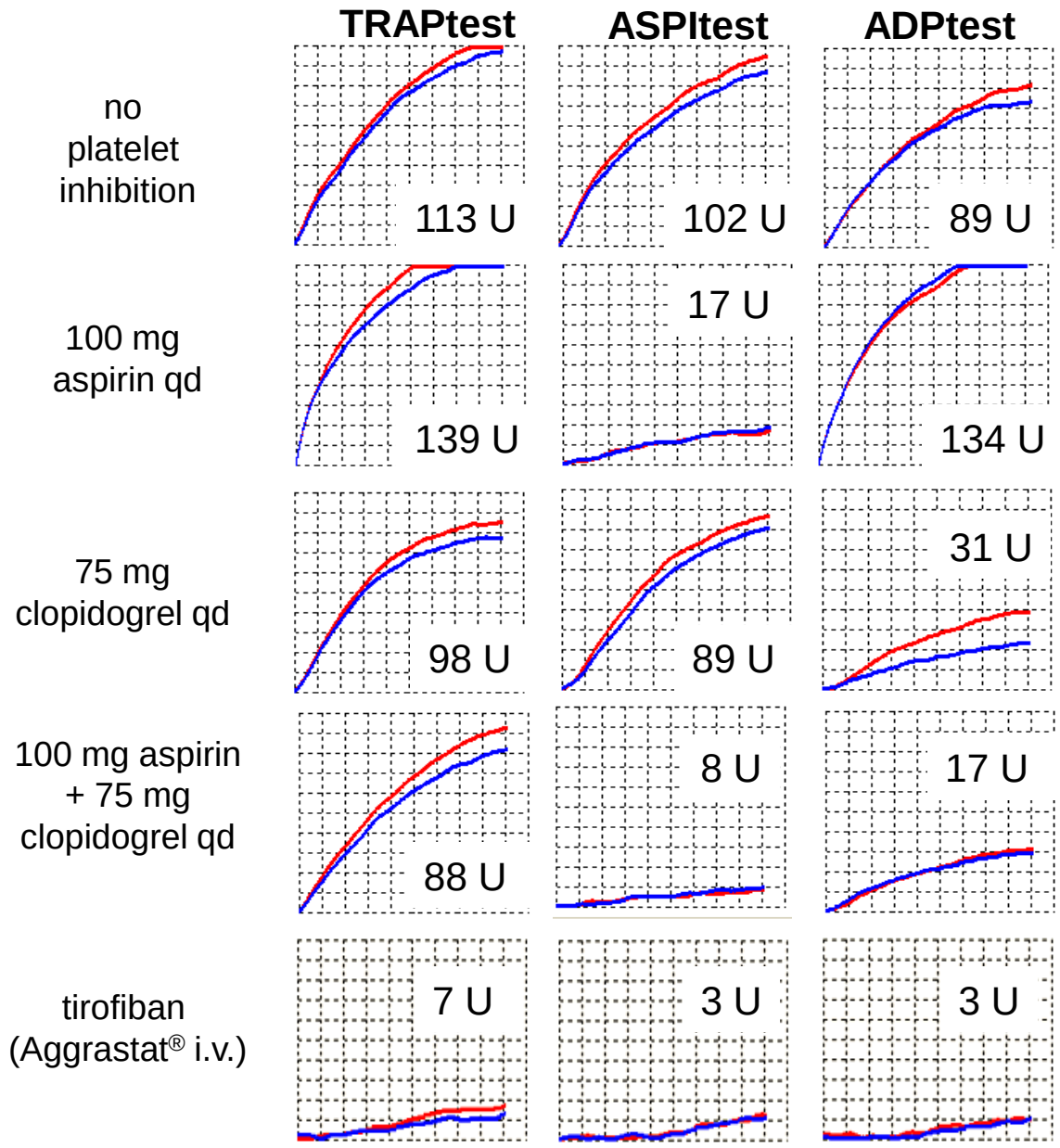
**Area under the curve = AUC**

- *most important parameter*
- *expressed in AU*min or U (10 AU*min = 1 U)*

# Multiplate
## Main tests

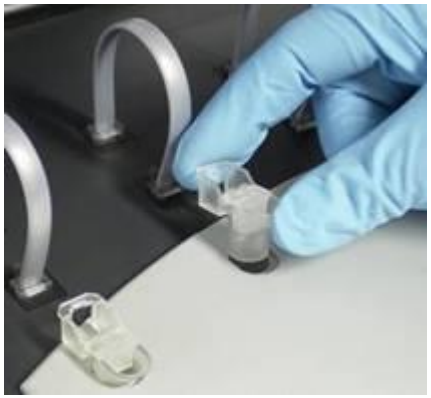


# Multiplate tracings
## Examples



# Multiplate
## Application

put the test cell into the measuring position



attach the sensor cable

pipette 300 µl of saline + 300 µl of blood*

allow 3 minutes for warming and equilibration


add the activator

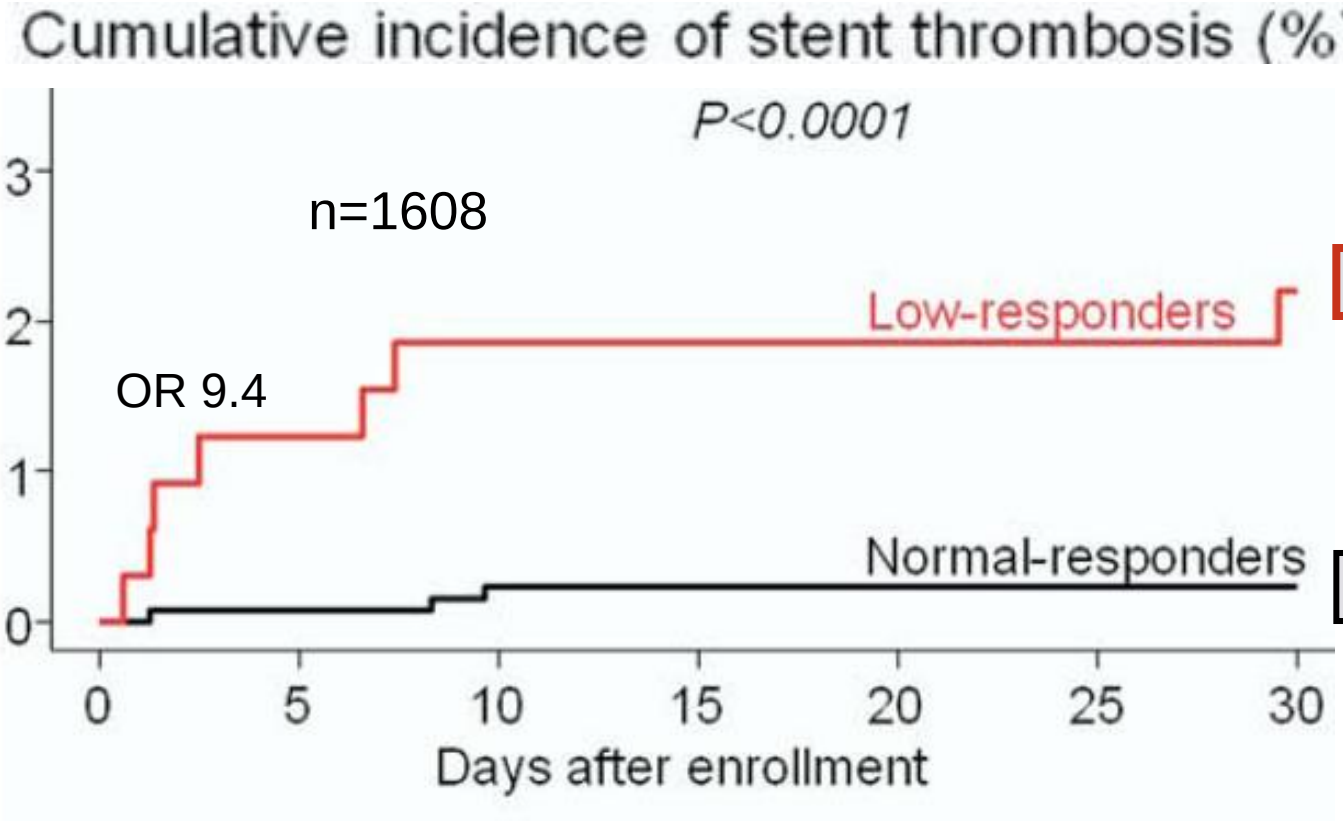
after 6 minutes:

- print the results
- discard the test cell

* usually hirudin or heparin blood

# Platelet Reactivity After Clopidogrel Treatment Assessed With Point-of-Care Analysis and Early Drug-Eluting Stent Thrombosis

Dirk Sibbing, MD, Siegmund Braun, MD, Tanja Morath, MS, Julinda Mehilli, MD, Wolfgang Vogt, MD, Albert Schömig, MD, Adnan Kastrati, MD, Nicolas von Beckerath, MD




5-10 x increased risk for ST, q-wave MI and stroke for clopidogrel low-responders (20% of the patients)

very low risk for clopidogrel „responders“ (80% of the patients)

JACC 2009 Mar 10;53(10):849-56.
Am Heart J. 2010 Aug;160(2):355-61.

**Consensus Paper on ADP receptor antagonist monitoring**

# Consensus and Future Directions on the Definition of High On-Treatment Platelet Reactivity to Adenosine Diphosphate

Laurent Bonello, MD,* Udaya S. Tantry, PHD,§§ Rossella Marcucci, MD, PHD,‖ Ruediger Blindt, MD,# Dominick J. Angiolillo, MD, PHD,‖‖ Richard Becker, MD,¶¶ Deepak L. Bhatt, MD, MPH,## Marco Cattaneo, MD,¶ Jean Philippe Collet, MD, PHD,‡ Thomas Cuisset, MD,† Christian Gachet, MD, PHD,§ Gilles Montalescot, MD, PHD,‡ Lisa K. Jennings, PHD,*** Dean Kereiakes, MD,††† Dirk Sibbing, MD,** Dietmar Trenk, PHD,†† Jochem W. Van Werkum, MD, PHD,‡‡ Franck Paganelli, MD,* Matthew J. Price, MD,‡‡‡ Ron Waksman, MD,§§§ Paul A. Gurbel, MD,§§ for the Working Group on High On-Treatment Platelet Reactivity

*JACC. 2010 Sep 14;56(12):919-33.*

**Table 2**

## Studies Linking High On-Treatment Platelet Reactivity to Ischemic Events Based on ROC Curve With a Specific Cutoff Value

| Study (Ref. #) | Assay | End Point | AUC | Odds Ratio |
|---|---|---|---|---|
| Gurbel et al. (69) | LTA | 2-year post-PCI MACE | 0.77<br>0.78 | 3.9<br>3.8 |
| Blindt et al. (62) | VASP-PRI | 6-month ST | 0.79 | 1.16 |
| Marcucci et al. (75) | VerifyNow P2Y12 assay | 1-yr CV death and nonfatal MI | 0.66 | 2.38 CV death<br>2.76 nonfatal MI |
| Sibbing et al. (80) | Multiplate analyzer-ADP | 30-day ST | 0.78 | 12.0 |
| Cuisset et al. (81) | LTA | 1-month ST | 0.69 | 5.8 |
| Breet et al. (82) | LTA<br>VerifyNow P2Y12 assay<br>Plateletworks | 1-yr death, MI, ST, and stroke | 0.63<br>0.62<br>0.62<br>0.61 | 2.09<br>2.05<br>2.53<br>2.22 |

→ best predictivity for Multiplate


**Thank you very much for your attention!**