BioLane HTI 16V

Automated In Situ Hybridization and Immunohistochemistry

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Overview

BioLane HTI 16V

- History
- Applications
- Hardware
- Accessories
- Software
- BioLane HTI 16V for Western blot processing

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History – BioLane HTI

BioLane HTI 16V

- Developed in 2001 by H&H in cooperation with JOBO as an automated system for (Western) blot staining
- *In situ* application officially launched in 2003 with 48-well plates; especially popular in zebra fish community
- Introduction of individual baskets 2004
- Development of the slide tub 2005
- June 2008, Intavis and H&H instrument joined together
- In 2008, development of the new BioLane HTI 16V, an advanced version of the old BioLane HTI
- Totally installed units about 170, exclusively Western 60-70 (of these for prionics test ~35)

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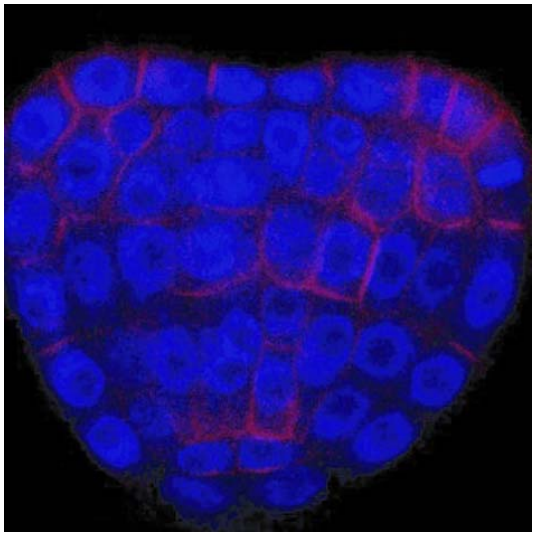
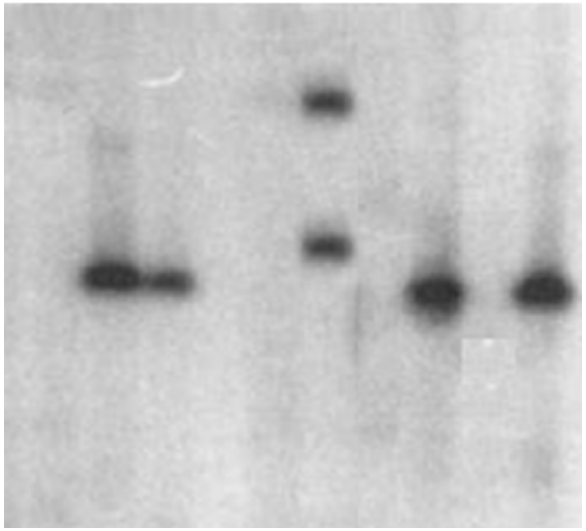
BioLane HTI 16V – Applications

BioLane HTI 16V

In situ hybridization



Immunohistochemistry



Western blot processing

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Hardware – Two systems in one

BioLane HTI 16V

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Hardware – Two systems in one

BioLane HTI 16V

- **Two independent incubation units**
  - heating/cooling
  - shaking

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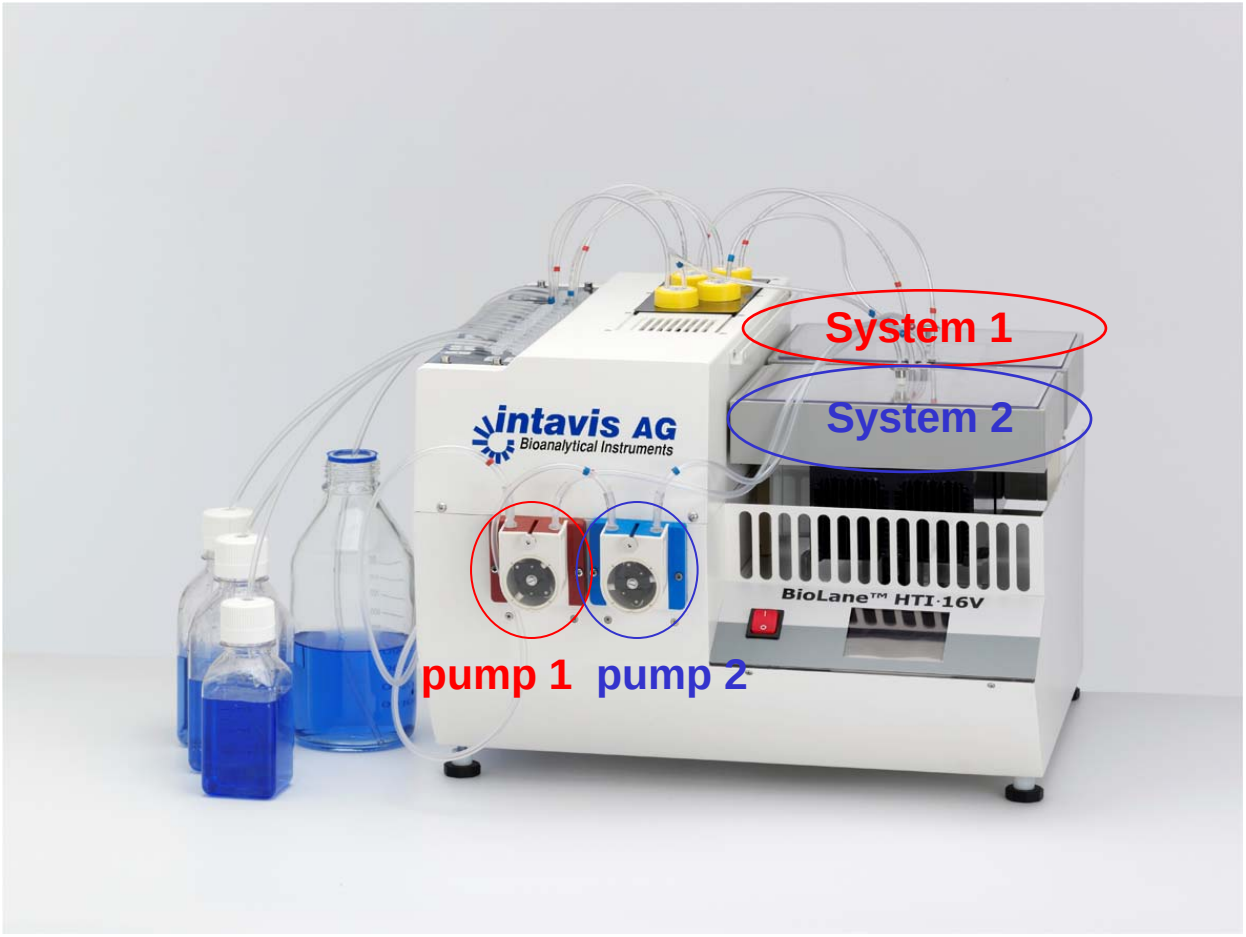
Hardware – Two systems in one

BioLane HTI 16V



- Two independent incubation units
  - heating/cooling
  - shaking
- **Two independent peristaltic pumps**
  - for buffer delivery and recovery

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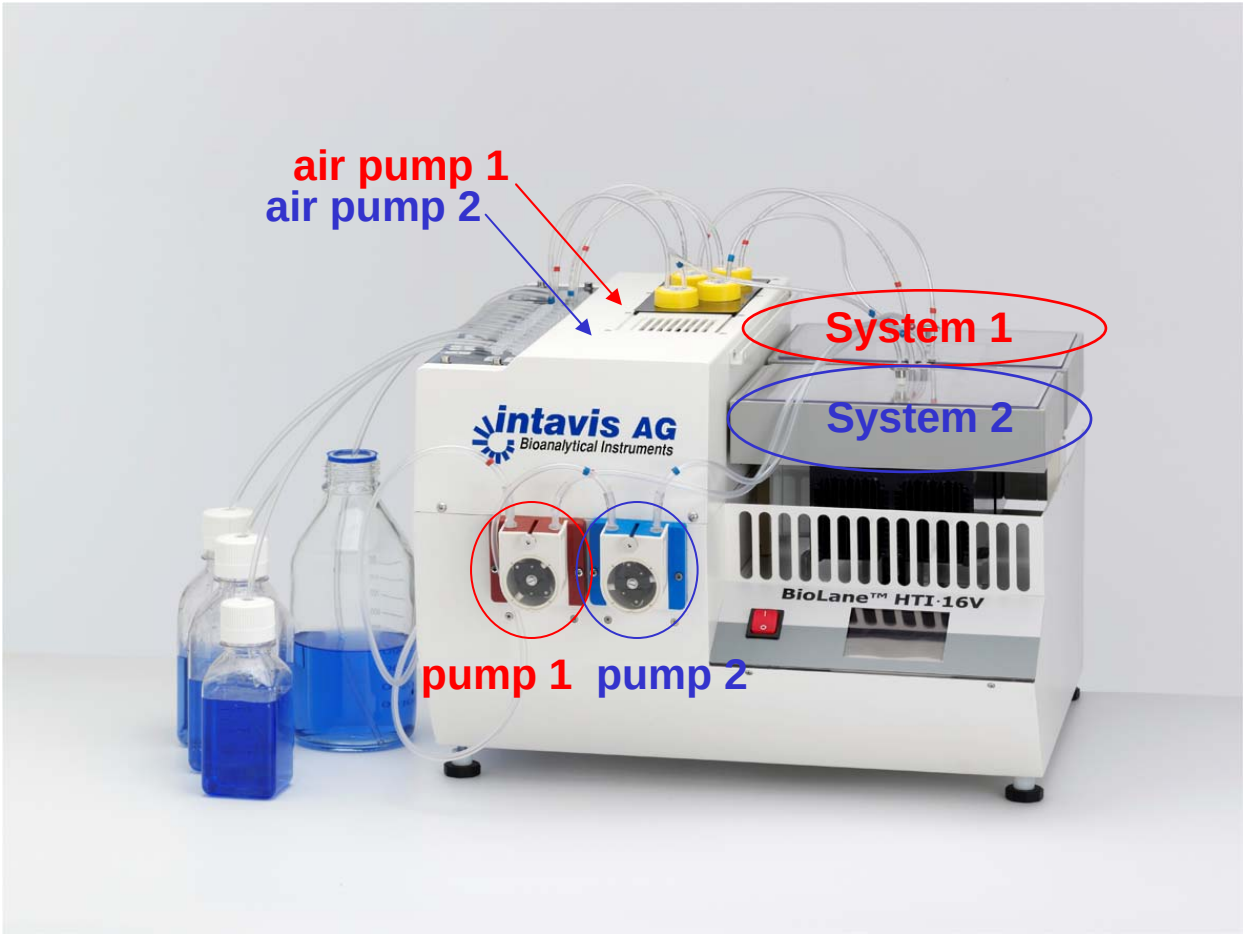
Hardware – Two systems in one

BioLane HTI 16V



- Two independent incubation units
  - heating/cooling
  - shaking
- Two independent peristaltic pumps
  - for buffer delivery and recovery
- **Two independent air pumps**
  - for antibody delivery and recovery

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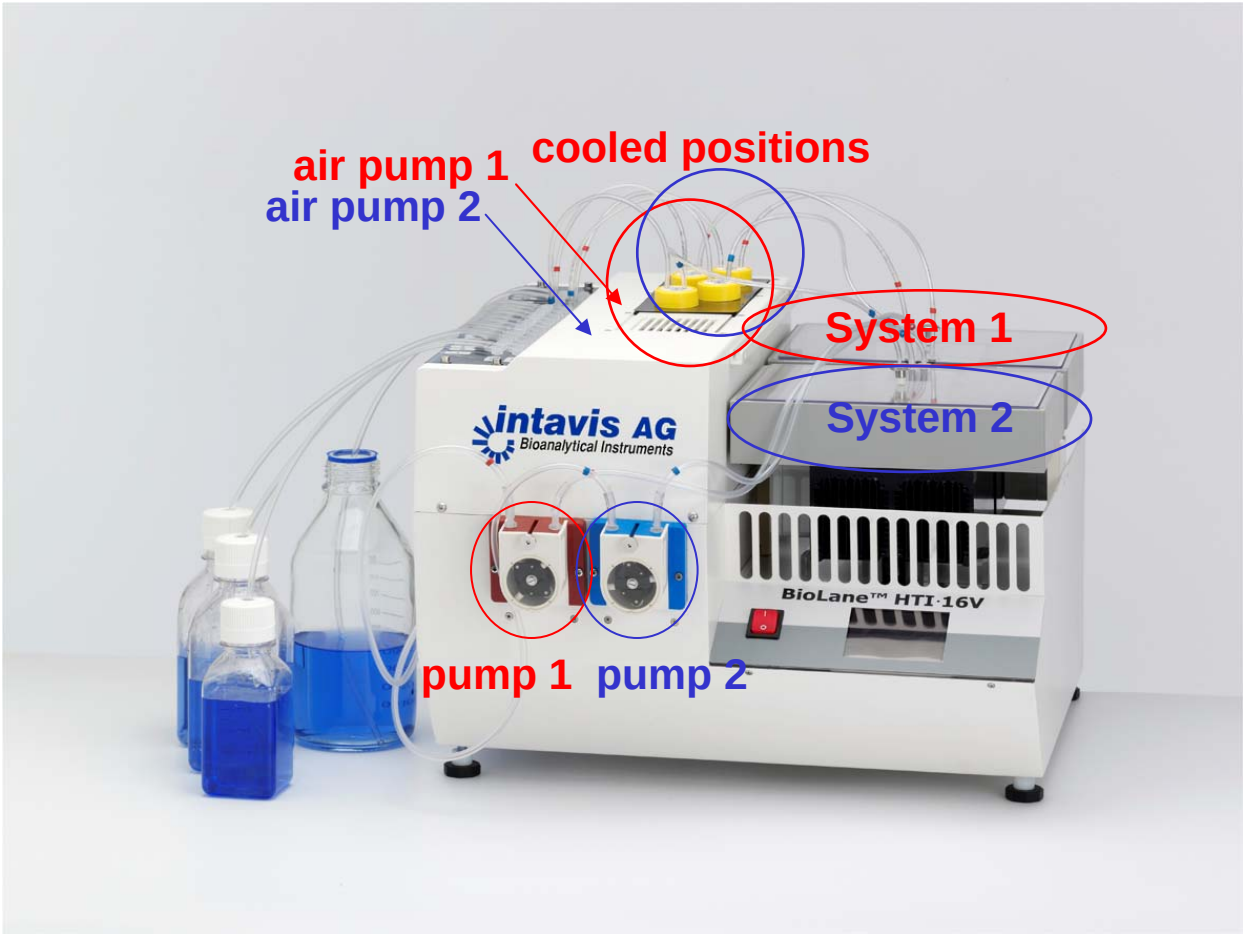
Hardware – Two systems in one

BioLane HTI 16V



- Two independent incubation units
  - heating/cooling
  - shaking
- Two independent peristaltic pumps
  - for buffer delivery and recovery
- Two independent air pumps
  - for antibody delivery and recovery
    - **Cooled positions**
  - 2x2 positions for 50 ml Falcons or 125ml vials
  - individual tube paths

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Hardware – 16 way valve

BioLane HTI 16V

- **One 16 way valve for buffer selection**
  - 2x 14 positions for buffers
  - 2x 2 positions for waste
  - independent connections for both systems

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Hardware – PDA operated

BioLane HTI 16V

- **Operated by touch screen PDA**
  - running the instrument easy by PDA
  - LAN connection for online monitoring
  - programming via external PC or PC in the network via remote control

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Hardware – Configurations

BioLane HTI 16V

- Tray plus accessories for application

→ + Medium baskets for ISH/IHC up to 40 samples/unit
→ + Large baskets for ISH/IHC of larger specimens up to 24 samples/unit
→ + plates for ISH/IHC screen up to 48 samples/unit
→ + Slides for washing ISH/IHC of sections up to 25/unit
→ Only trays for Western Blot up to 4 blots/unit, depending on size
→ + 2D incubation unit and trays for 2D-Western, up to two/unit

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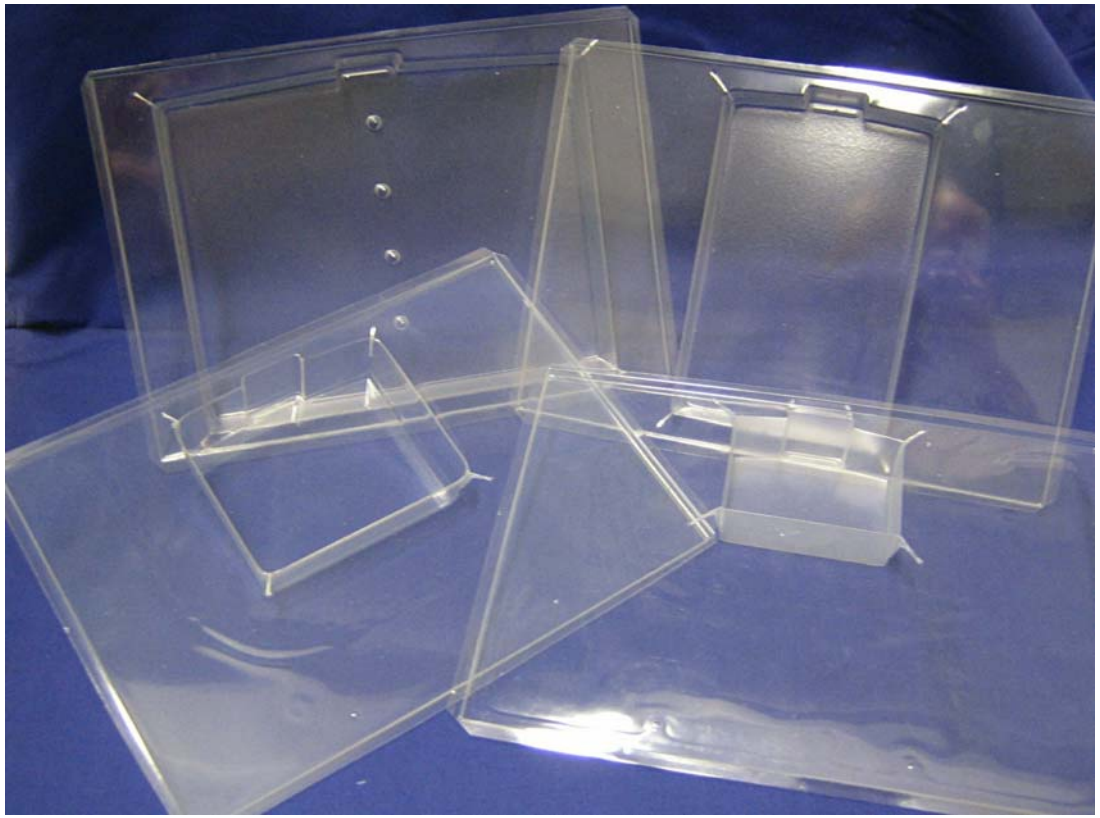
Accessories – trays

BioLane HTI 16V



- **4 different tray sizes**
  - Extra small 12-16ml
  - Small 25-30ml
  - Medium 50-60ml
  - Double medium 100-120 ml

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Accessories – incubation baskets

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Extra small:
- Up to 8 medium

Small:
- Up to 20 medium

Medium:
- Up to 40 medium

Extra small:
- Up to 6 large

Small:
- Up to 12 large

Medium:
- Up to 24 large

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Accessories – medium baskets hybridization

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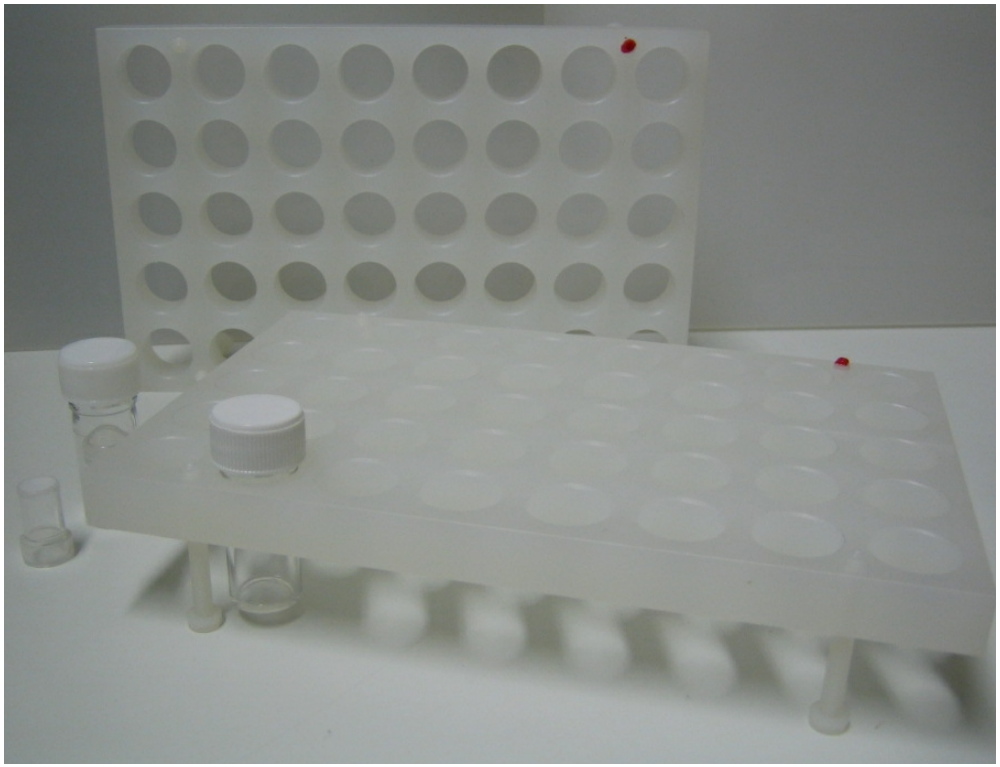

Hybridization in vials

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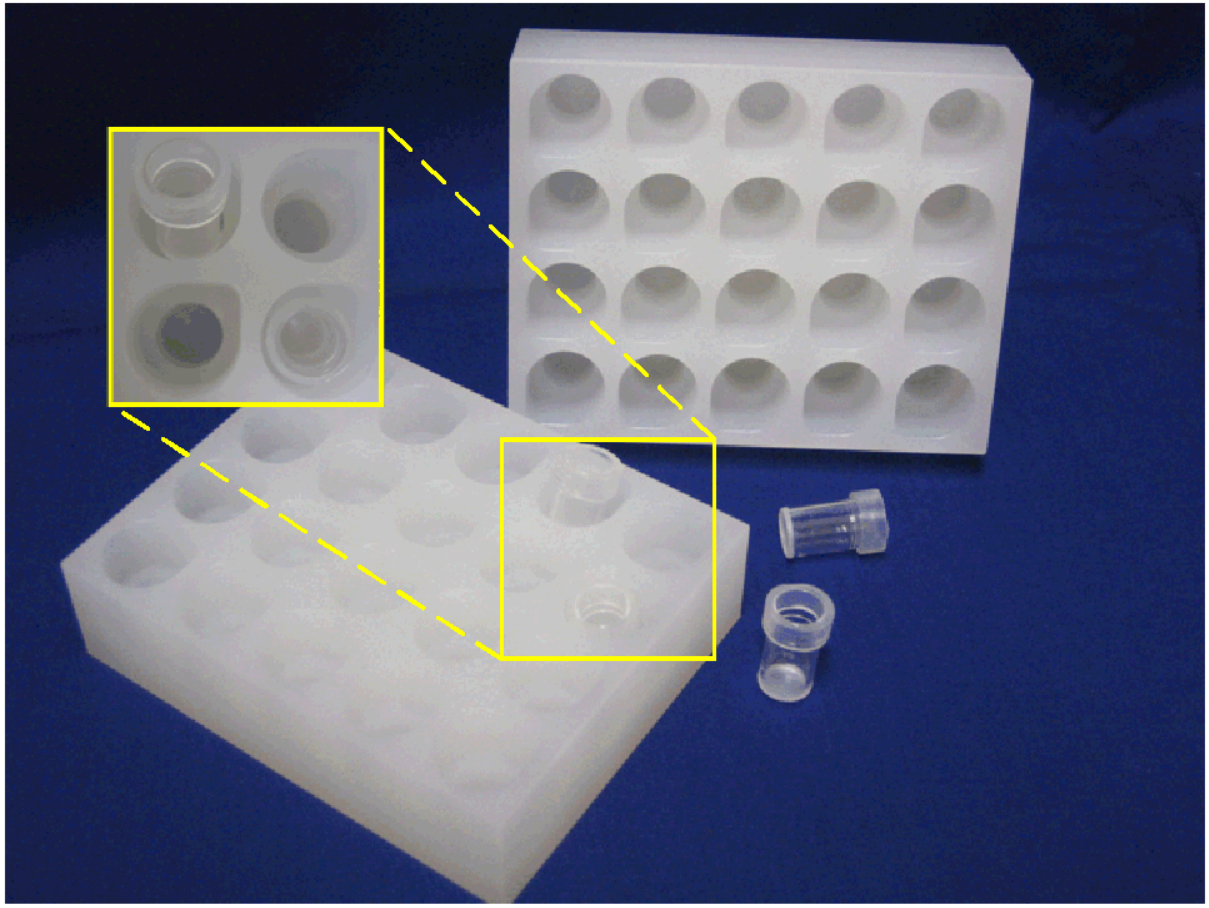
Accessories – large baskets hybridization

BioLane HTI 16V



Hybridization in plate

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Accessories – plate and plate incubation

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Only for medium tray: 48 medium in plate

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Accessories – slide incubation

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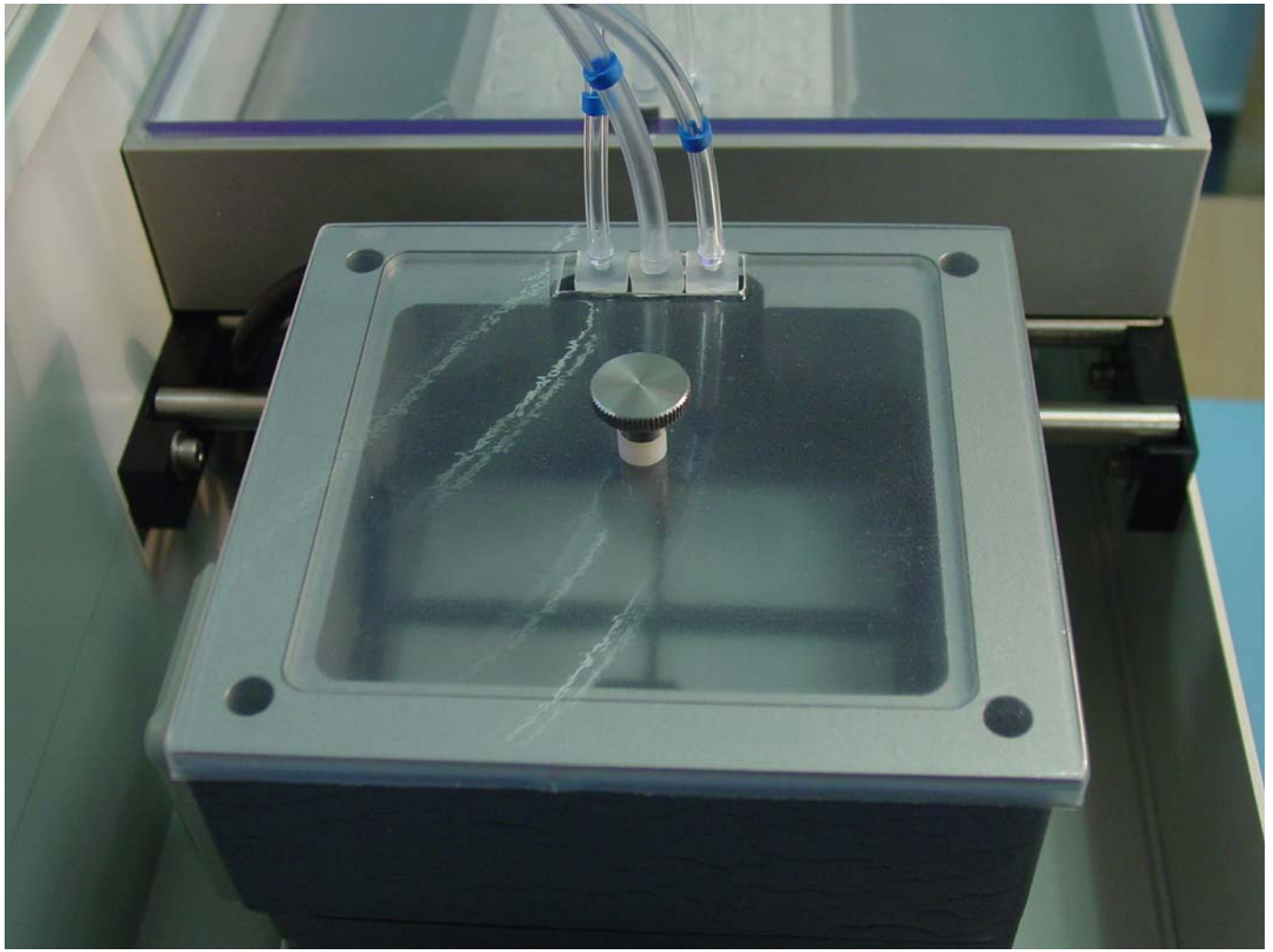

- Only washing
- Up to 25 slides/ incubation unit

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Software – Structure

Self-test

Run mode ⟷ *Edit* mode

- Switch to *Edit* mode
- Open method
- Information
- Start run/pause run
- „Print“: email method/log file
- Switch off system

- Switch to *Run* mode
- Open method
- Information
- User account administration
- Config
- Service

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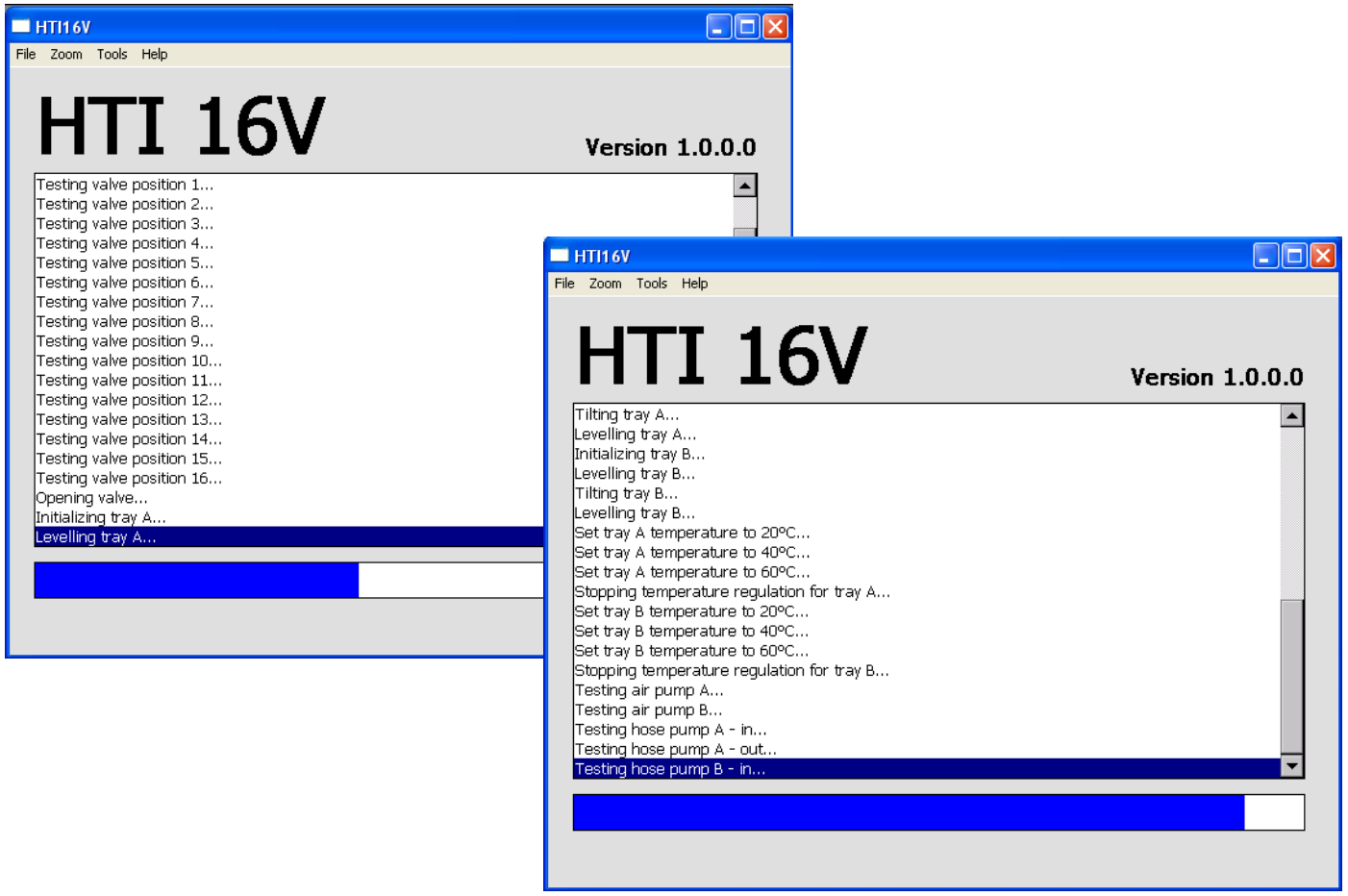
Software – Self-test



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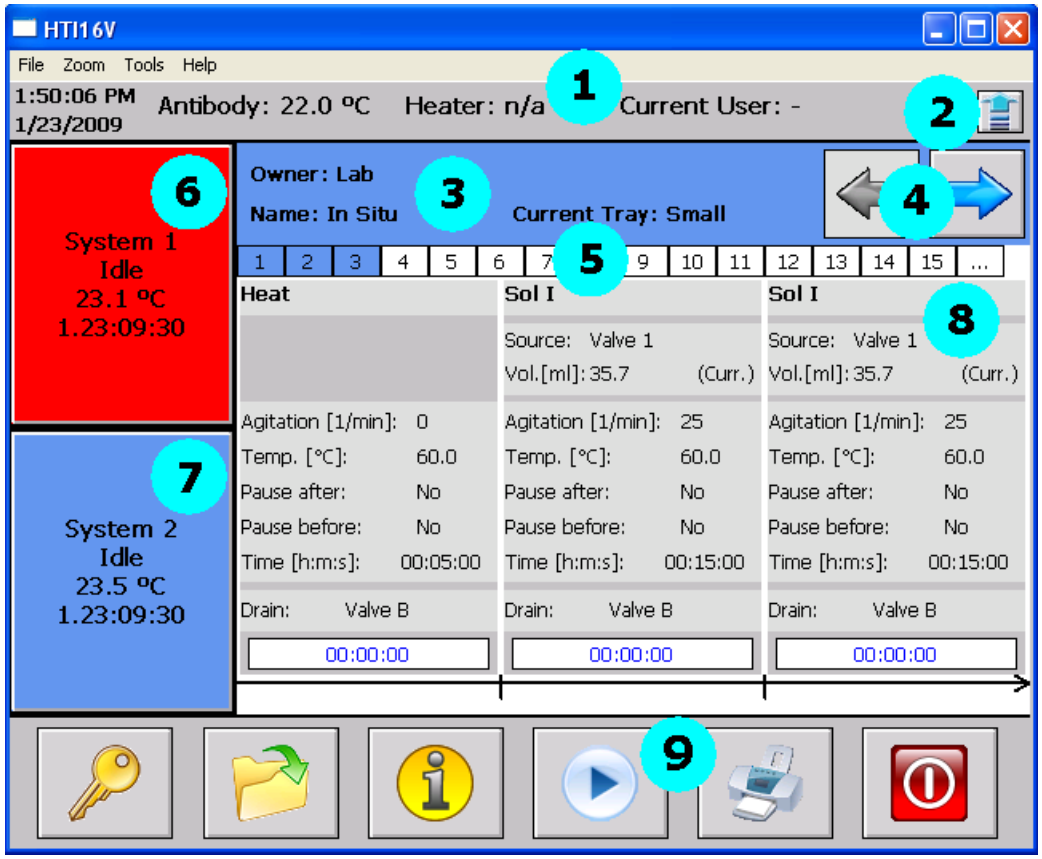
Software – The Run *mode*

BioLane HTI 16V



1. Status line
2. TCP/IP button to connect to a network
3. System information
4. Method navigation arrows
5. Method step numbers
6. Red system (system 1)
7. Blue system (system 2)
8. Combi step
9. Icon bar

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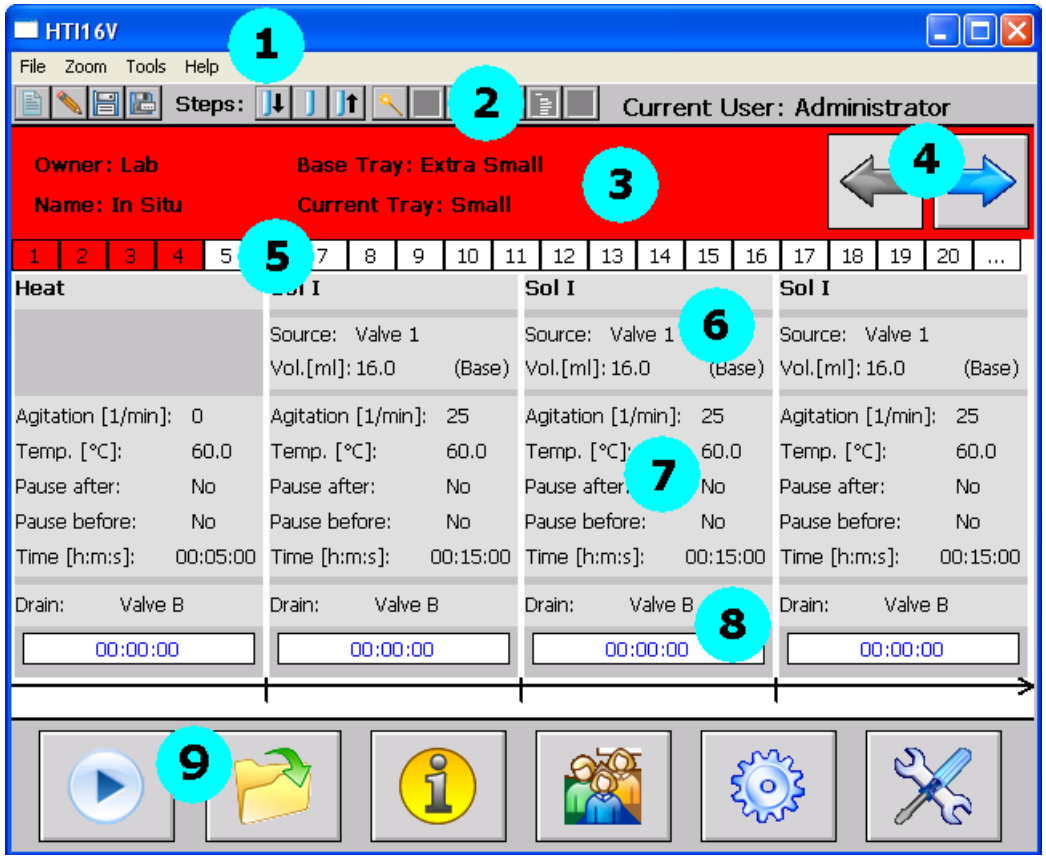
Software –The Edit *mode*

BioLane HTI 16V



1. Status line
2. Small icon bar to edit programs
3. Program information
4. Method navigation arrows
5. Method step numbers
6. Inpump step
7. Incubation step
8. Outpump step
9. Icon bar

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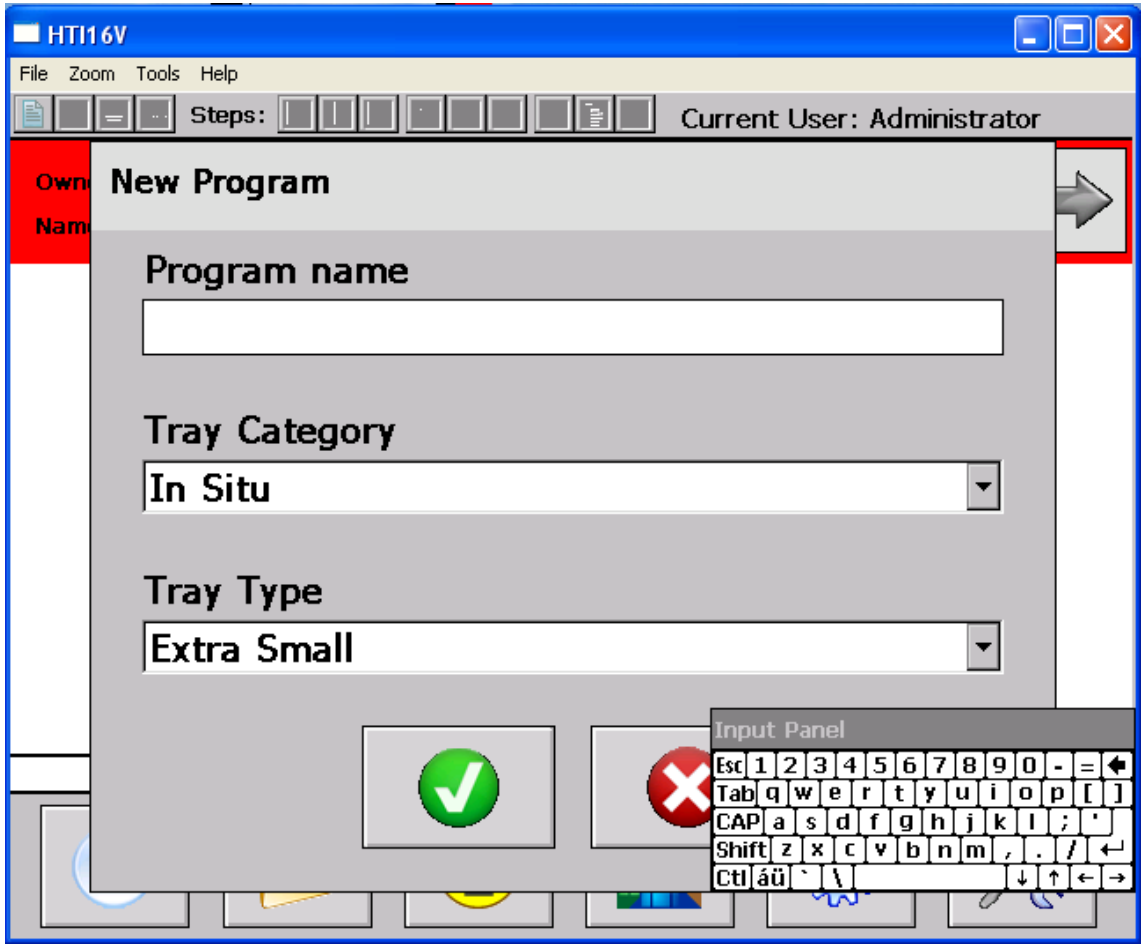
Software – Programming

BioLane HTI 16V



- **Program name**
- **Tray category**
- **Base tray type**

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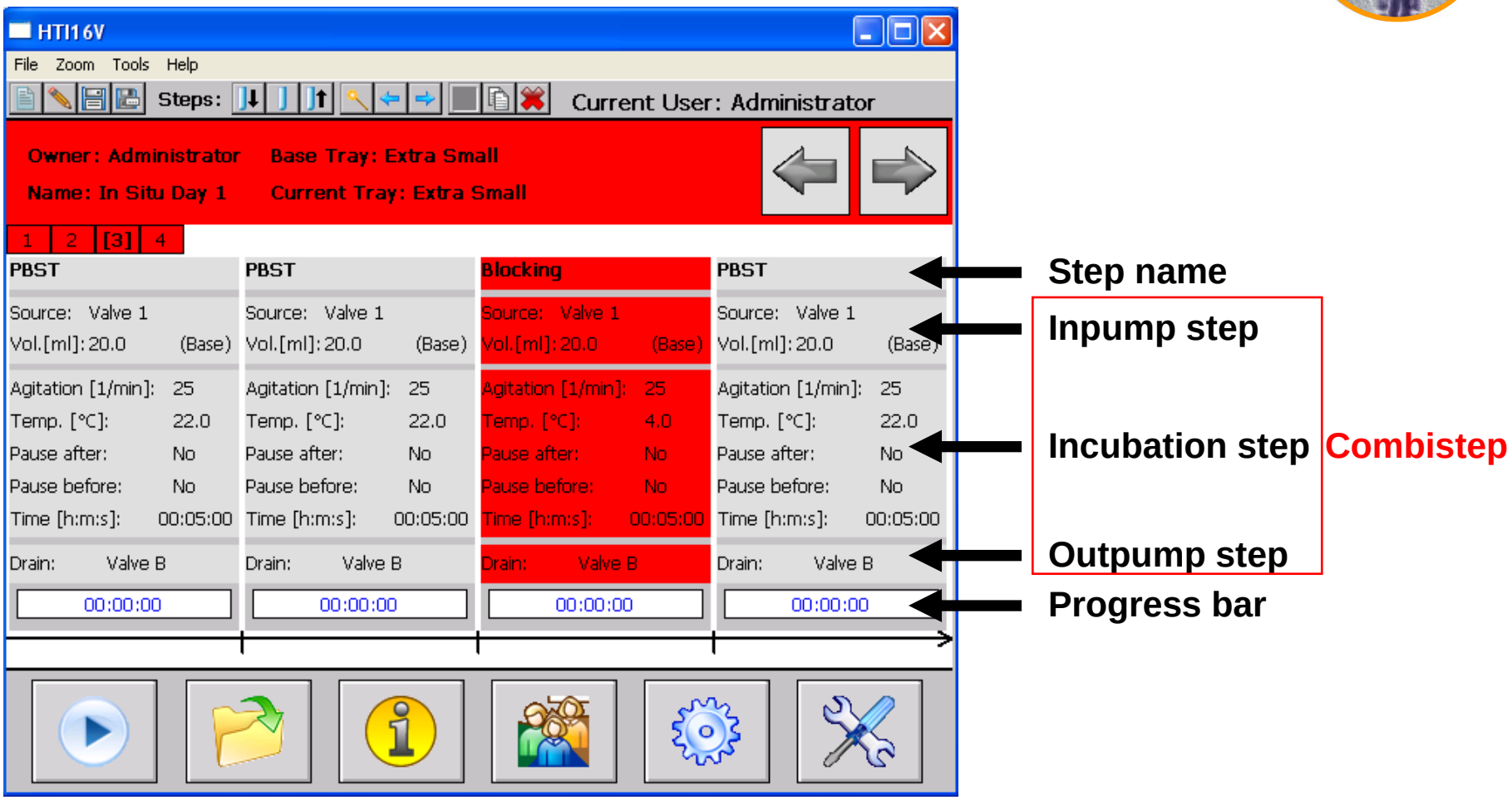
Software – Steps



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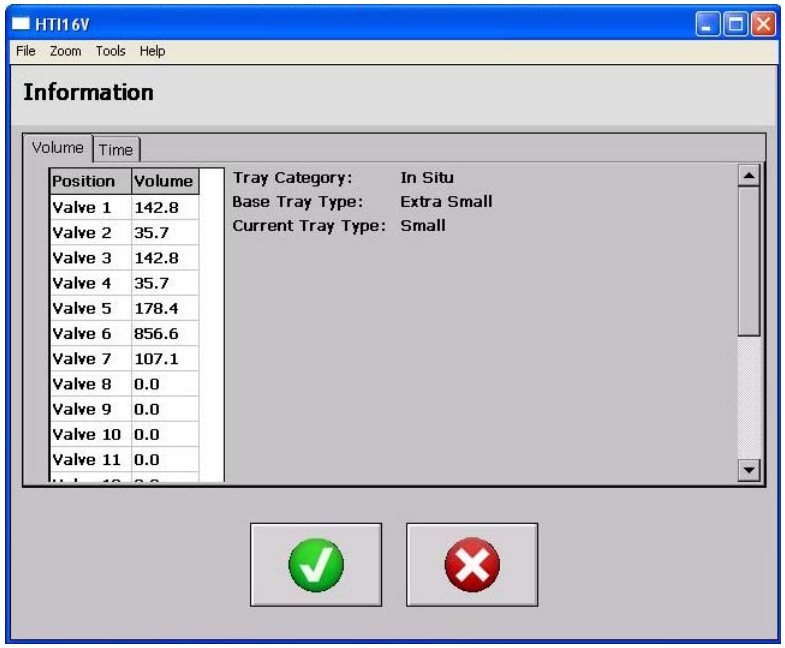
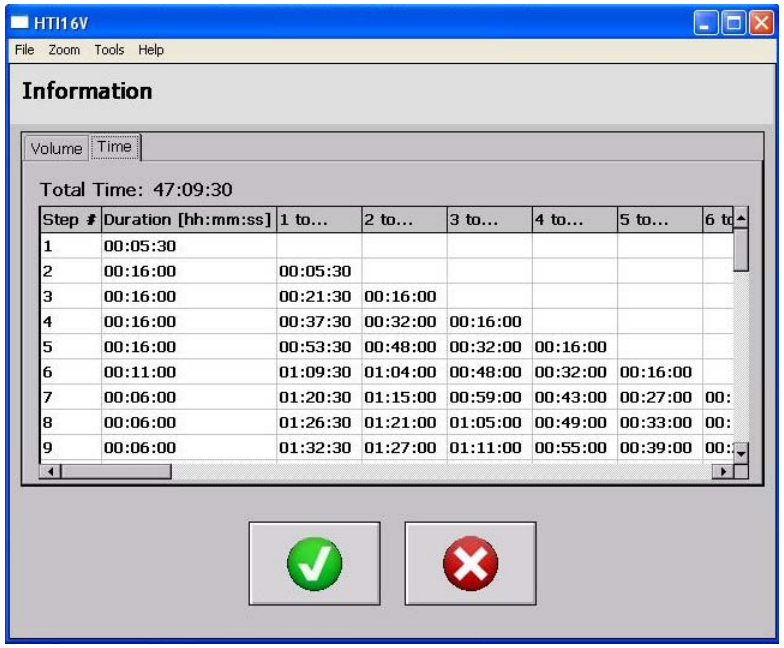
Software – Information

BioLane HTI 16V



Volume information



Runtime information

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Software – Online monitoring and remote control

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- System can be directly connected to a PC by a crossed cable or to a LAN network using TCP/IP
- Via remote control, you can directly operate the system or monitor progress online
- Reminders can be send by email when program finished
- Protocols can be sent by email

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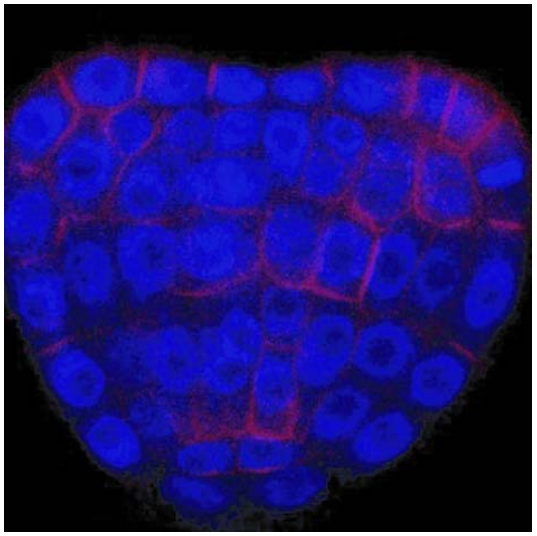
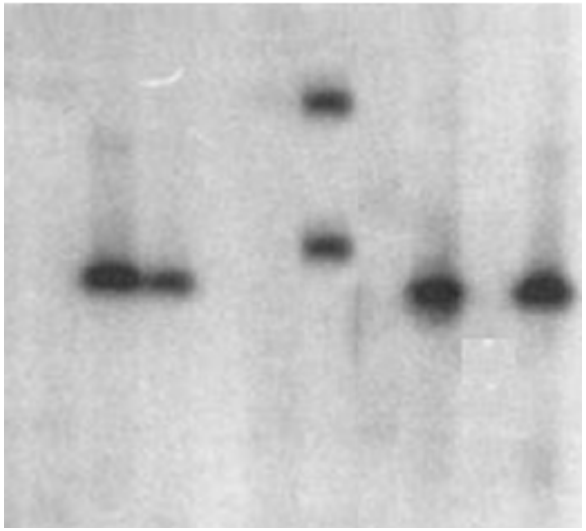
BioLane HTI 16V – Applications

In situ hybridization



Immunohistochemistry



Western blot processing

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Applications – Western blot processing

BioLane HTI 16V

- Separation of a protein mixture by SDS-gelelectrophoresis
- Transfer to and immobilization on membrane

Western Blotting

- Processing for detection

typically

3x washing
primary antibody
3x washing
secundary antibody
3x washing
Detection

Western Blot Processing

Can be automated by the BioLane HTI 16V

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Western Blot Processing – Why BioLane HTI 16V

- Improves results
  - Independent tube paths for buffers, primary and secondary AB
  - Antibody binding easy to optimize due to temperature control
  - Luffing, no round shaking for max liquid exchange
  - Fluorescent antibodies can be used due to non-transparent lid
- Increases reproducibility:
  - Time, volume, temperature reproducibly the same, independent from environmental conditions
  - Standardization even for untrained personal
  - Automated GLP reports possible
  - Better comparability due to standardized protocols. Better initial data → better quantification results (especially 2D gels)
- Saves time
  - System can work o/n as well
  - Higher temperature allows shortening of incubation times
- Can handle and recover antibodies
  - Uninterrupted cold chain
  - Vial does not have to be changed
  - Higher consumption, but can be recovered and reused

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Western Blot Processing – Competition

BioLane HTI 16V

Competitors

- LI-COR Blot Washer
- Stovall Blot Washer
- Freedom Rocker

  and others…

→ Simple tumblers with pumping system

Li-COR Blot washer

Compared to BioLane HTI 16V

- No significant improvement of results
  - Usually no independent tube path for antibody
  - No easy optimization of binding conditions
- Limited increase in reproducibility
  - Usually no heating/cooling of incubation units
- Time saving limited
  - Usually no automated application of antibody
- Unsufficent antibody handling
  - No uninterupted cold chain or recovery

BUT: cheap!

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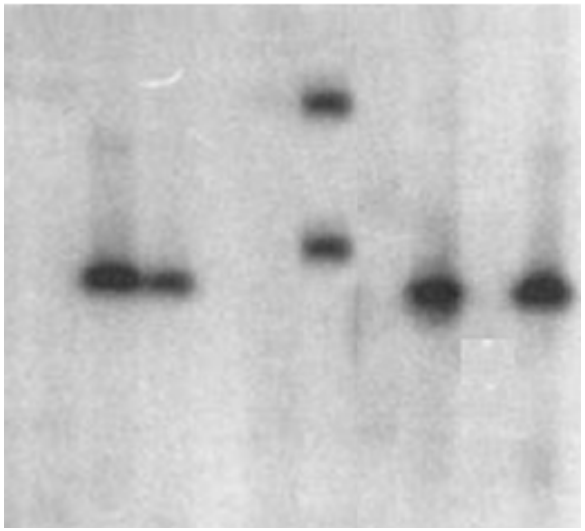
Western Blot Processing – Potential customers

BioLane HTI 16V

- Prionics (BSE testing)
- Clinical applications, e.g. high safety labs (S3+/L3+)
- 2D-Western
- Industrial (GLP-reports)



Western blot

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