AIDPATH – MODULAR MANUFACTURING PLATFORM FOR AI-ENABLED HOSPITAL-BASED ATMP PRODUCTION

Frederik Erkens M.Sc.
Fraunhofer Institute for Production Technology IPT

This work has been performed in the framework of the H2020 project AIDPATH co-funded by the EU under grant agreement number 101016909.

DOI: 10.24406/publica-338

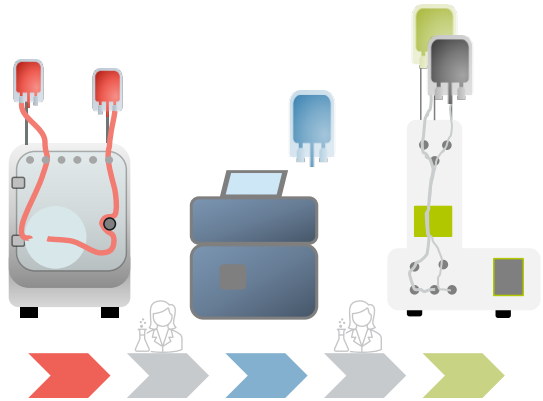
ATMP manufacturing
Current levels of automation

Process automation

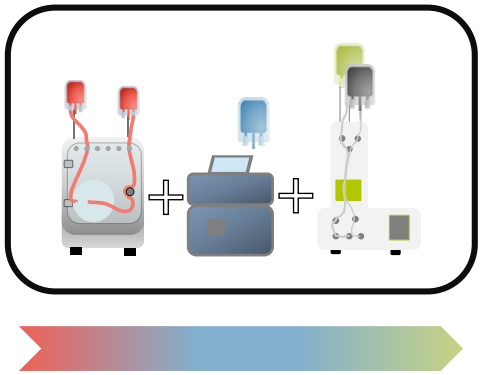
Modularity

Manual Manufacturing

Automated Unit Operations



Integrated Automation



This work has been performed in the framework of the H2020 project AIDPATH co-funded by the EU under grant agreement number 101016909.

DOI: 10.24406/publica-338

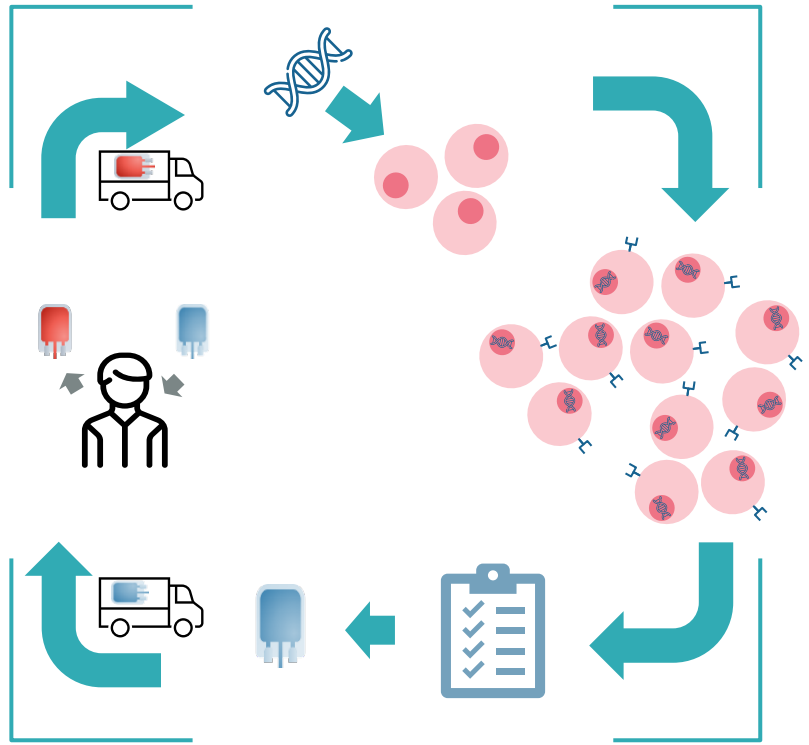
AIDPATH

ATMP Manufacturing
Decentralization

Transportation steps require cell freezing impeding cell quality and delaying vein to vein time

Large Cleanroom facilities for ATMP Manufacturing are expensive to maintain

Digitalization and data availability in the manufacturing process is low not exploiting potentially valuable information



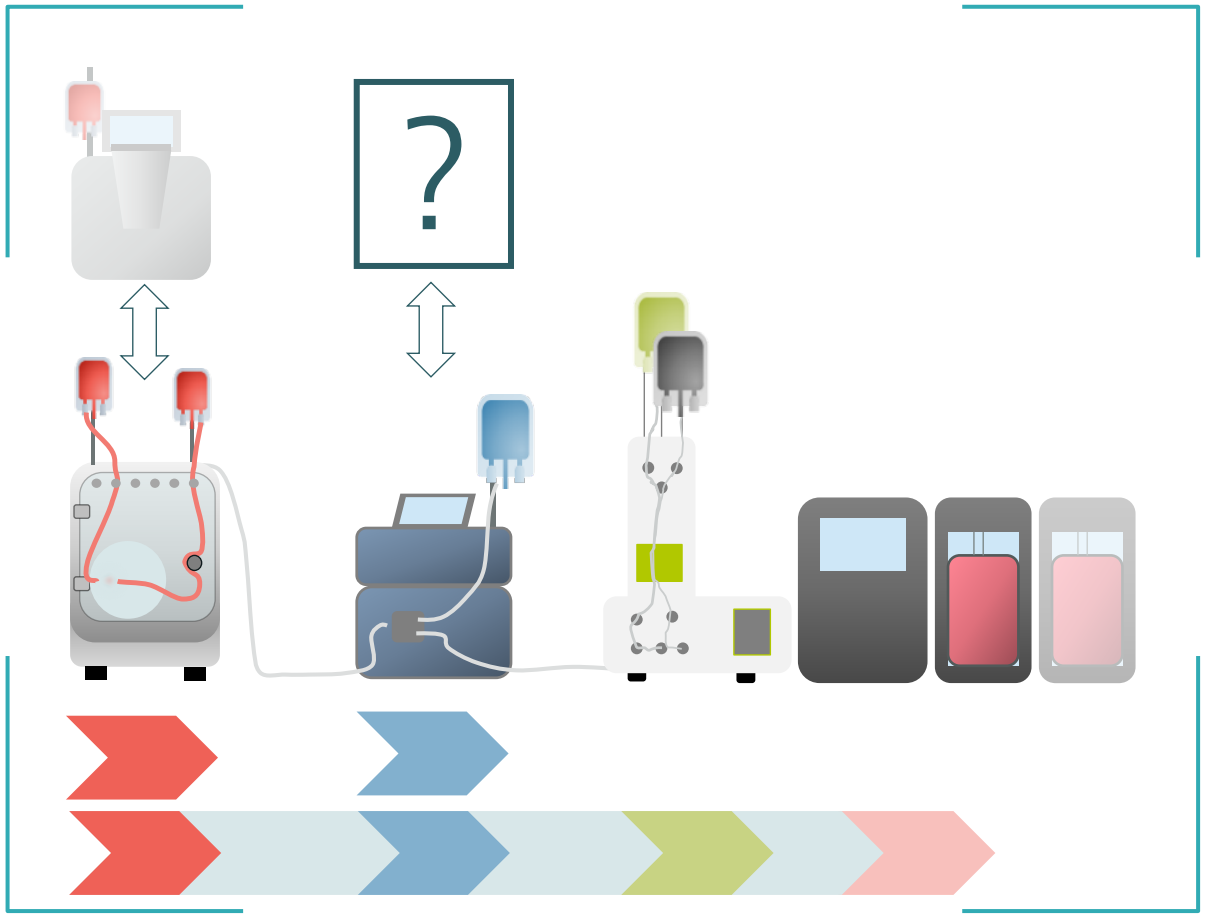
Decentralize ATMP production in Smart Manufacturing Hospitals

This work has been performed in the framework of the H2020 project AIDPATH co-funded by the EU under grant agreement number 101016909.

DOI: 10.24406/publica-338

AIDPATH

ATMP Manufacturing
Modularity and Scalability



- Connected tubing-kit based modules for **end-to-end** automated manufacturing system
- **Modular** design enables straightforward upgrade path towards future technological developments
- Focus on **closed manufacturing** system eliminates cross contamination risk and enables **parallelization** of patients

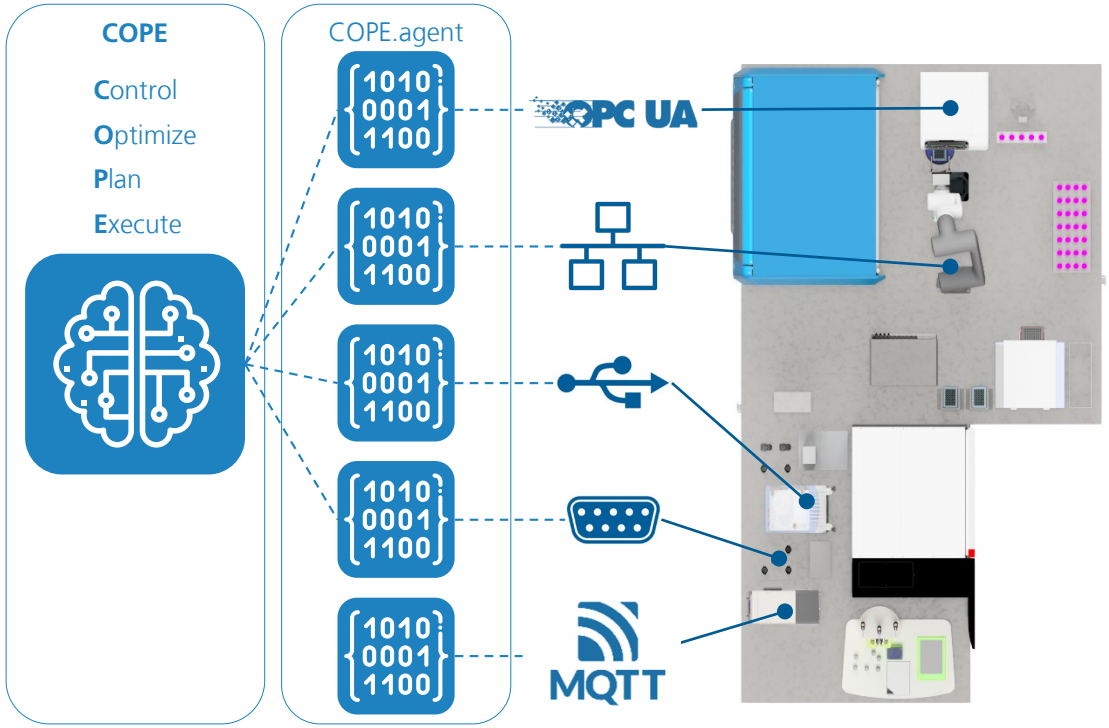
This work has been performed in the framework of the H2020 project AIDPATH co-funded by the EU under grant agreement number 101016909.

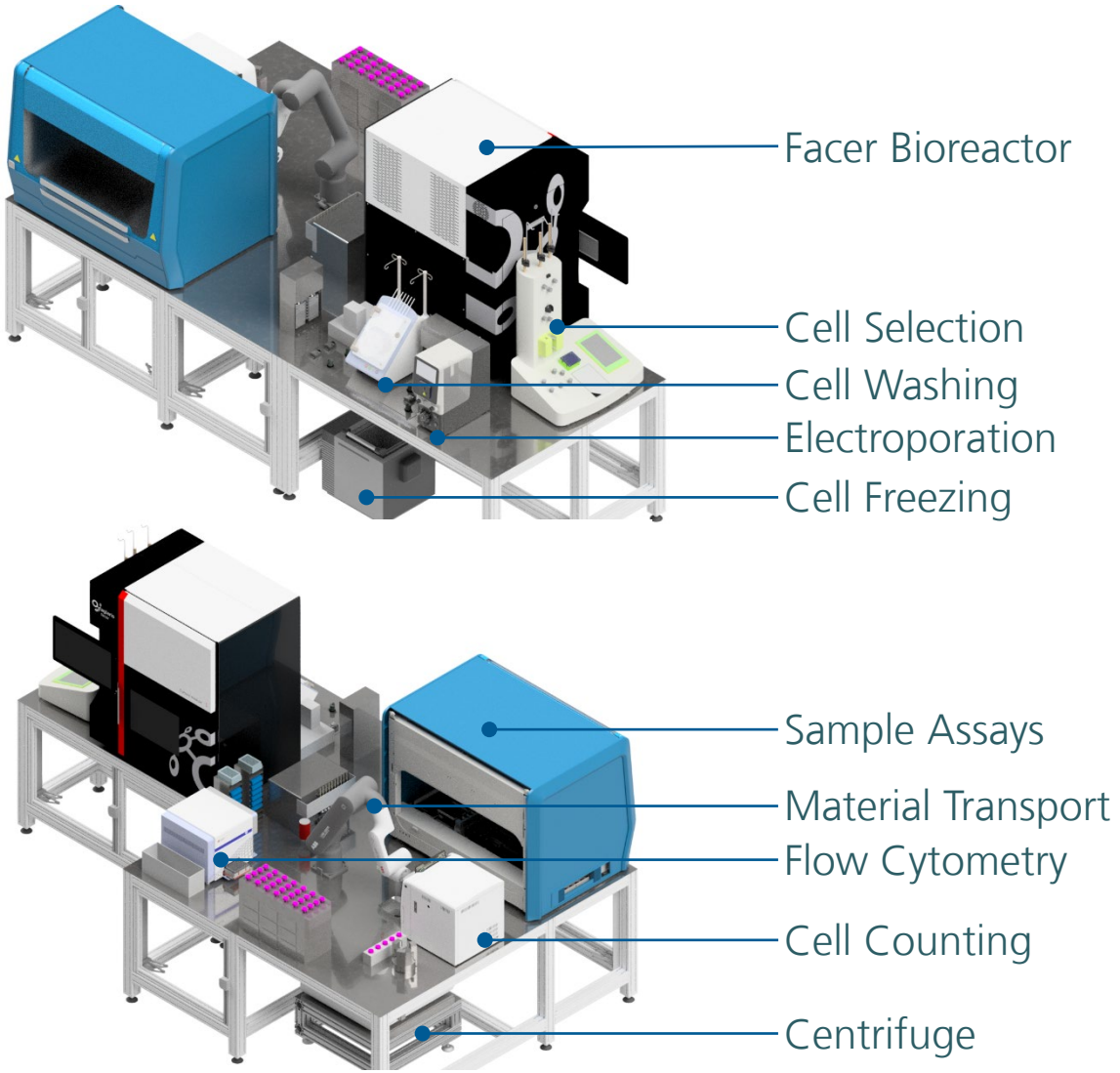
DOI: 10.24406/publica-338

AIDPATH

The AIDPATH Manufacturing System

Fluidic and Robotic automation hand in hand





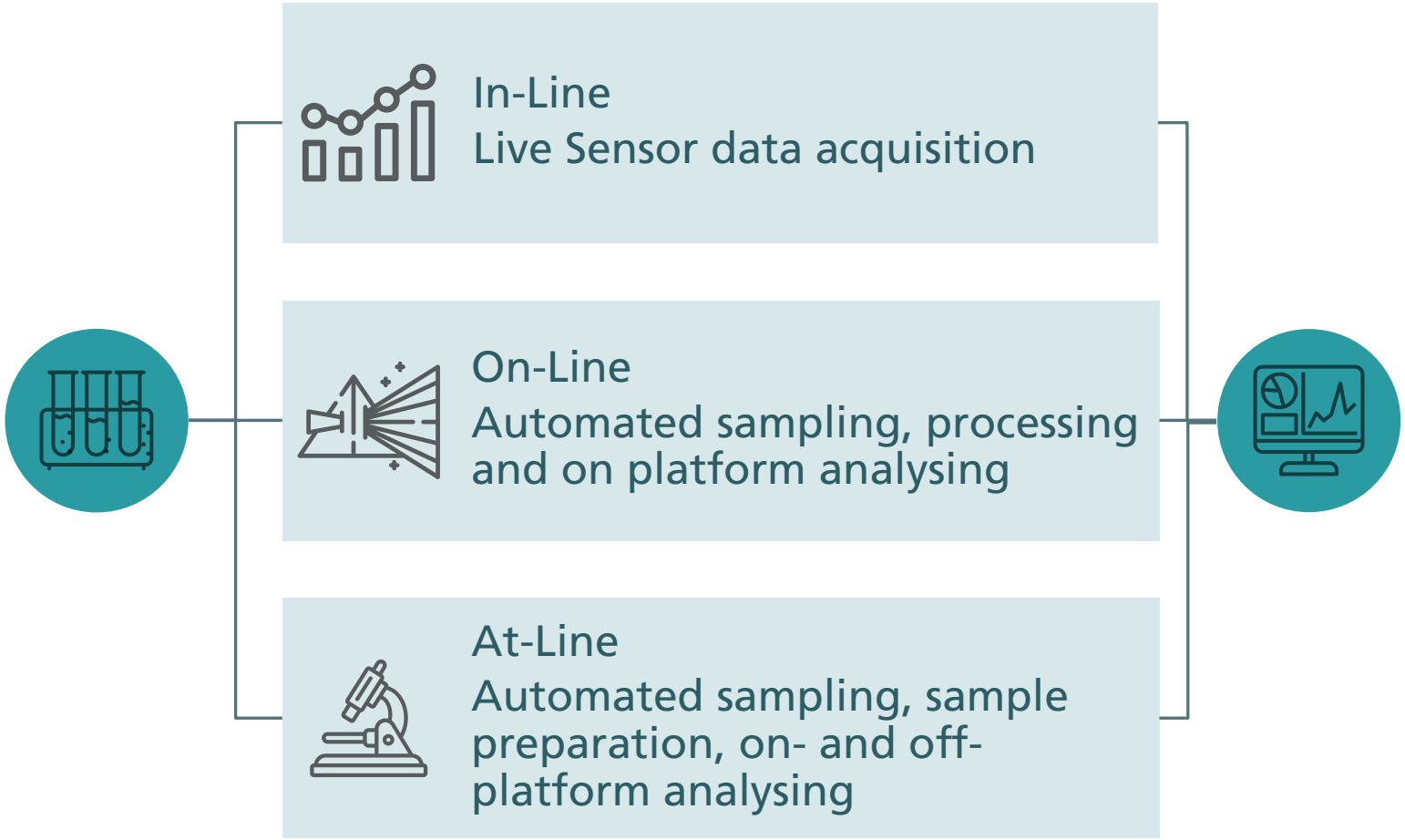
This work has been performed in the framework of the H2020 project AIDPATH co-funded by the EU under grant agreement number 101016909.

DOI: 10.24406/publica-338

AIDPATH

Integrated automated QC laboratory

Extensive data acquisition and generation



- Data enables digital twin of the CAR-T Product
- Implement adaptive process control elements based on information from the analytic devices
- Supplies AI with process insight
- Supports accelerated release testing

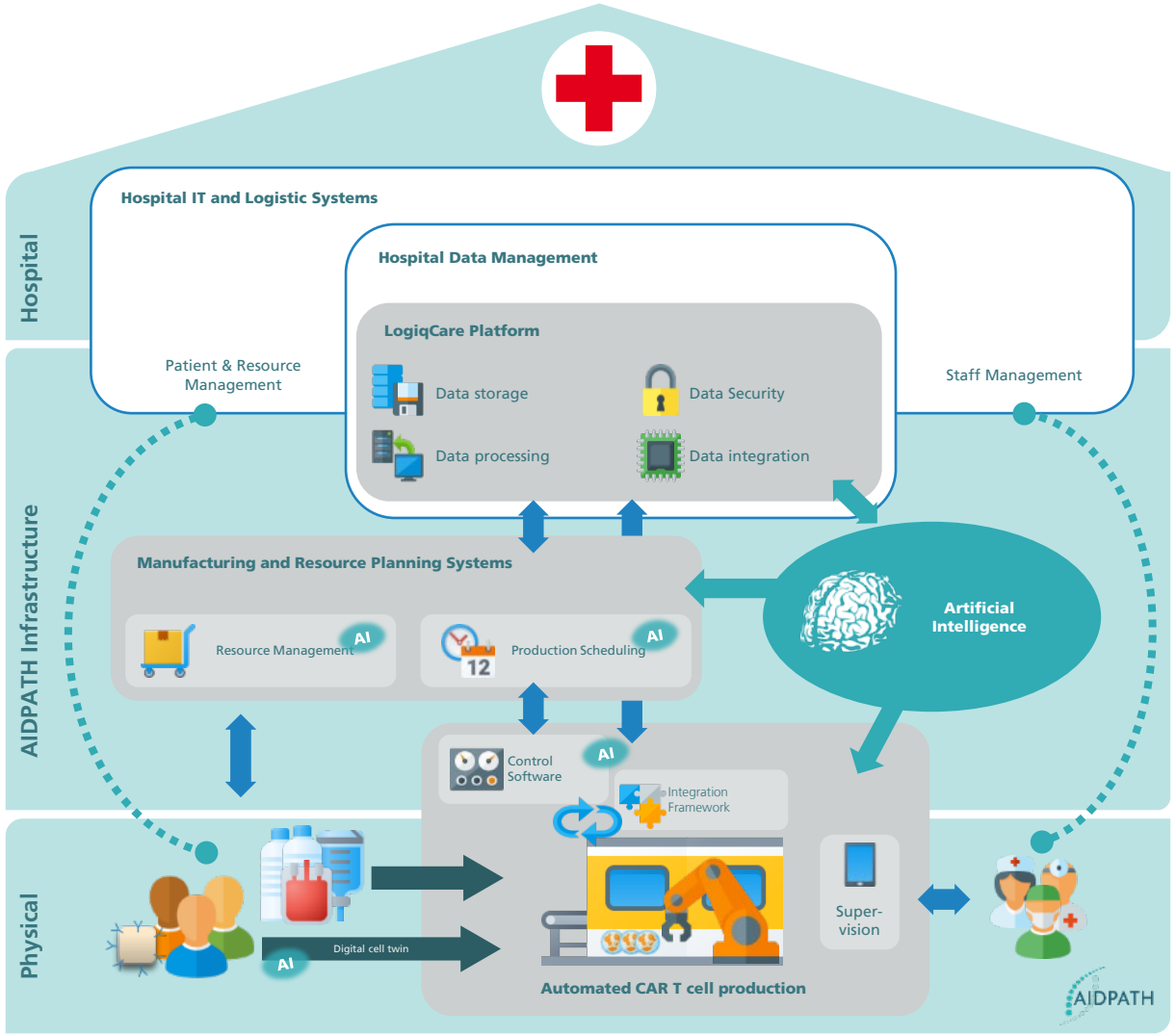
This work has been performed in the framework of the H2020 project AIDPATH co-funded by the EU under grant agreement number 101016909.

DOI: 10.24406/publica-338

AIDPATH

The Smart Manufacturing Hospital
Data management and decision support

- Decision support and process insight intensification through integration of **trustworthy artificial intelligence**:
  - Adaptive Bioreactor Control Strategy
  - Reactive Bioreactor Control Strategy
  - CAR-T Digital Twin
  - Production Scheduling
  - Resource Management
- Integration in the Hospital IT-Infrastructure
  - Data management makes data available to AI
  - Storage platform stores batch data and historical data sets



This work has been performed in the framework of the H2020 project AIDPATH co-funded by the EU under grant agreement number 101016909.

DOI: 10.24406/publica-338

AIDPATH

Future of manufacturing
Key Takeaways

- Develop **closed modular** manufacturing **platform** and build an end-to-end automated pilot for pre-clinical validation
- **Optimize** personal CAR-T cell manufacturing by supporting it **with artificial intelligence** for optimal control parameters and clinical integration
- Establish **architecture for hospital integration** to support the CAR-T manufacturing and development of AI solutions

This work has been performed in the framework of the H2020 project AIDPATH co-funded by the EU under grant agreement number 101016909.

DOI: 10.24406/publica-338

AIDPATH

Thank you for your attention!

This work has been performed in the framework of the H2020 project AIDPATH co-funded by the EU under grant agreement number 101016909.

DOI: 10.24406/publica-338