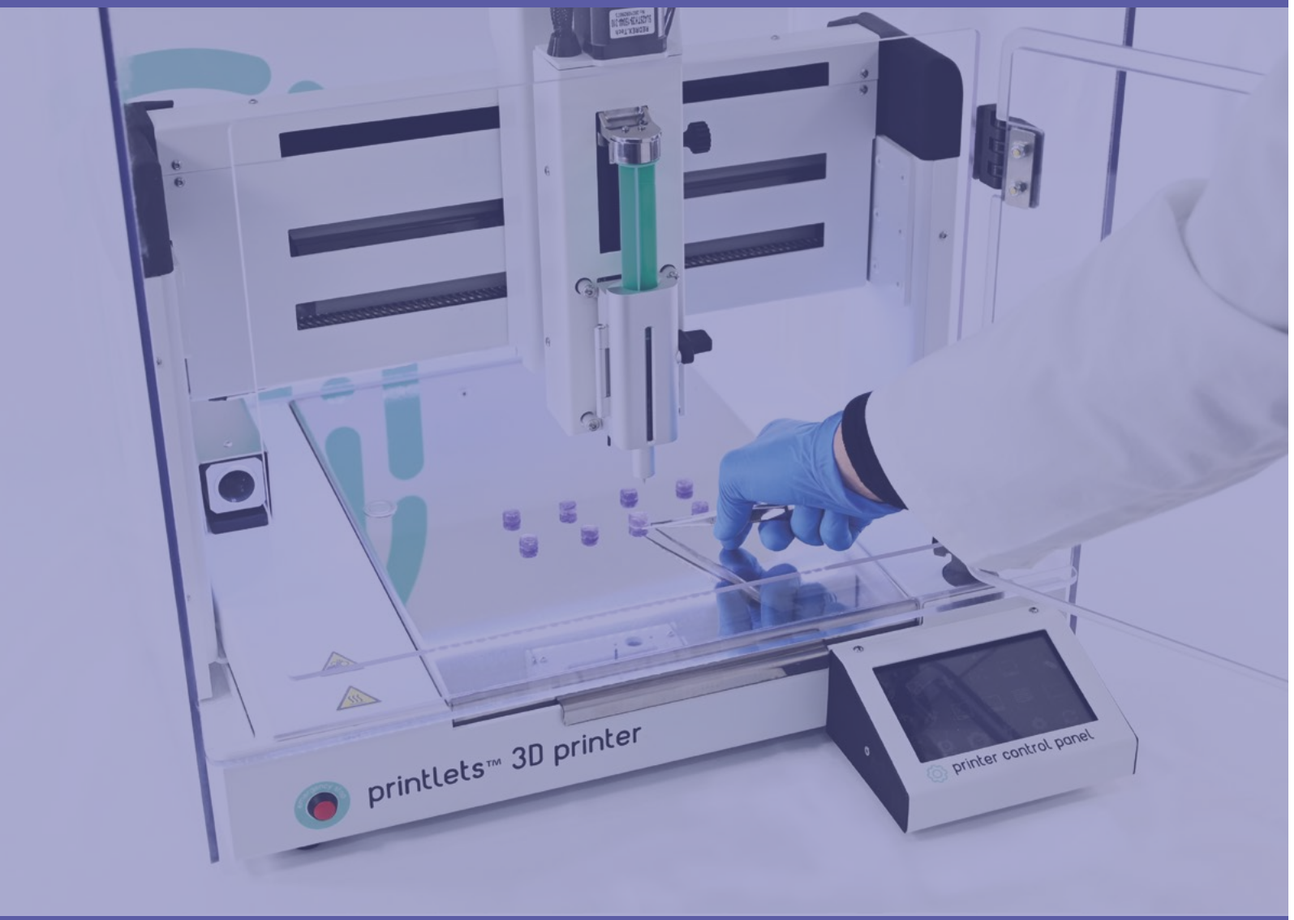
FABRX
pharmaceutical 3D printing

Pharmaceutical 3D printers for personalised medicine

Automated and safe patient-centric medicine



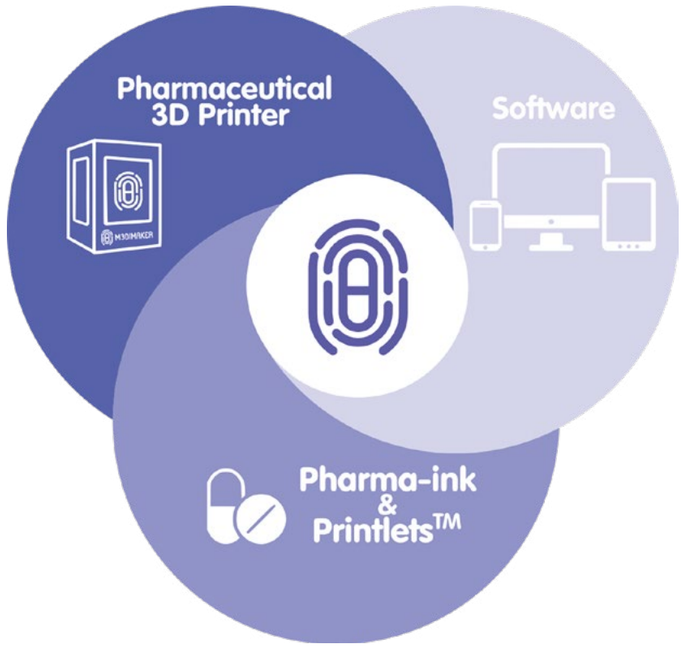
THE **FUTURE** OF MEDICINES IS 3D

The **FABRX** story so far

Established in 2014, FABRX are pioneers in the field of pharmaceutical 3D printing for personalised medicine. We carried out the world's first clinical study in 2018 and launched the first pharmaceutical 3D printer for small batch production in 2020.

We are now involved in multiple clinical studies across the world and have expanded our hardware range in response to feedback from our clinical collaborations.

We believe in a world where medical treatment can be personalised at the point of care to the individual needs of each patient, improving their treatment outcomes and well-being while reducing healthcare costs.



Pharmaceutical 3D Printer

The M3DIMAKER is the world's first GMP-ready pharmaceutical 3D printer series with patent-protected, in-built quality control features for human and veterinary precision medicine manufacture, available to purchase or rent.

Software

Our comprehensive M3DIMAKER Studio software packages can be used to control the printer, ensure quality and collect patient feedback.

Pharma-ink and Printlets

Our world leading scientists can help you design, develop and test pharma-ink for your chosen active ingredients.

Print your way to **personalised** healthcare

Our printers are GMP-ready and CE marked with stainless steel parts that can be taken apart easily for efficient cleaning. The printheads are exchangeable, meaning you only need one printer for multiple technologies and printheads can be exchanged for cleaning to allow for continuous printing.

- GMP Ready
- Exchangeable Printheads
- Fully Autonomous Printing
- Auto Levelling Build Plate
- Print Cost Calculation
- Multi-Device compatibility
- In-Built Camera
- In-built Security Measures
- Multi-file Type Support
- Internal Storage and Management of Multiple Projects
- Minimum 1 Year Warranty
- Upgrade Compatible

M3DIMAKER [1]

M3DIMAKER [2]

Exchangeable printhead system

Switch out for multiple technologies and easy cleaning

Semi Solid Extrusion (SSE)

Our standard Semi Solid Extrusion printhead for pastes and gels.

Fused Deposition Modelling (FDM)

Our standard Fused Deposition Modelling printhead for filaments.

Direct Powder Extrusion (DPE)

Our Direct Powder Extrusion printhead for powder mixes. This technology is based on hot melt extrusion, allowing you to print in the style of FDM while skipping the filament manufacture step.

Exchangeable Printheads specifications

Specifications	FDM	DPE	SSE
Speed (formulation dependent)	Approx. 3 minutes per printlet	Approx. 3 minutes per printlet	Approx. 8 minutes per 28 printlets
Temperature Range	Up to 250°C	Up to 230°C	Up to 100°C
Printhead Specific	Filament diameter: 1.75 or 2.85mm Nozzle diameter: 0.4 and 0.8mm	Single Screw Extruder, approx. 12mL hopper volume, nozzle diameter: 0.4 and 0.8mm	Handles 20mL syringes (20cc PE cartridges)

M3DIMAKER [1]

The M3DIMAKER 1 is our single printhead pharmaceutical 3D printer, perfect for:

- Research and manufacture of personalised medicines and medical devices
- Clinical trial batch manufacture for drug development
- Human and veterinary medicine

Number of Printhead Slots	1
Weight	Approx. 35kg
Power	100 - 240V AC, max. 1100VA, F 50/60Hz
Axis speed	0.1 - 200mm/s
Total construction volume (X/Y/Z)	200 x 200 x 100mm
Resolution	0.010mm
Printer dimensions (d x w x h)	608.38 x 520.30 x 508.00 mm

M3DIMAKER [2]

The M3DIMAKER 2 is our multi-printhead pharmaceutical 3D printer, perfect for:

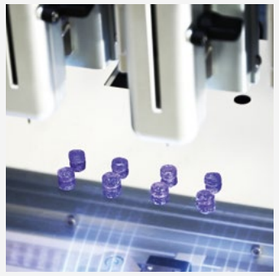
- Research and manufacture of personalised medicines and medical devices
- Clinical trial batch manufacture for drug development
- Human and veterinary medicine
- Higher throughput polypill manufacture, with 3 printhead attachments

Number of Printhead Slots	3
Weight	Approx. 65kg
Power	220 - 240V AC, max. 1600VA, F 50/60Hz (optional 100-125V AC or 100-240V AC)
Axis speed	Up to 300mm/s (18000mm/m)
Total construction volume (X/Y/Z)	225 x 225 x 90mm
Resolution	0.010mm
Printer dimensions (d x w x h)	640.53 x 1020.50 x 641.54 mm

In-line quality control

Near Infrared Sensor

Take quality control to the next level with in-line Near-Infrared analysis. Track drug loading for each individual printlet as the batch is being printed with FABRX's in-build Near-Infrared sensor.



Pressure Sensor

Ensure quality control with your semi-solid extrusion formulations. FABRX's SSE Laguna printhead uses in-line pressure sensing and automated flow stabilisation for additional quality assurance.

Balance

Weigh each printlet individually as your batch is being printed with our in-built balance. Quality assurance for every single pill.

Credit: University Medical Center Hamburg-Eppendorf/A.Kirchhof

"Whether providing 3D printing solutions or co-developing small-batch formulations with our clients, we always keep the patient in mind. We are enabling personalised medicine at the point of care"

Dr Alvaro Goyanes
Co-founder of FABRX

Optional upgrades

Upgrade your printer with these additional extras for more versatile formulation development and printlet manufacture.

PC AND MONITOR

Includes keyboard, mouse and wires. Only available in limited country specific formats. Available fanless for clean room use.

SSE UV PRINTHEAD

Semi-Solid Extrusion printhead with in-built UV Curing capabilities. Wavelengths 365nm or 405nm, Visible light laser λ=365nm or 405nm +/- 10nm.

HEATED BUILD PLATE

Heating up to 80°C.

CUSTOMISE YOUR PRINTHEAD SELECTION

Choose which printheads to add to your order, multiple technologies or multiple of the same printhead for easy cleaning.

CHOOSE YOUR QUALITY CONTROL ACCESSORIES

Perfect for patient care and clinical trial batch manufacture.

WE ARE CONTINUOUSLY DEVELOPING NEW UPGRADES TO ADD TO YOUR PRINTER

Sign up to our newsletter at www.fabrx.co.uk/newsletter to follow our updates.

Additional upgrades are in development

Bespoke software to use alongside our products.

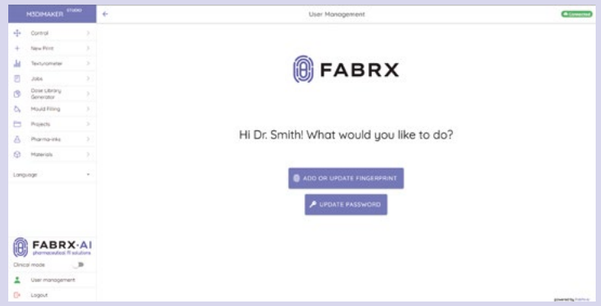
Developed by FABRX·AI

CONTROL

Use M3DIMAKER Studio to fully control the M3DIMAKER pharmaceutical 3D printers, from choosing your 3D model to changing the 3D printing parameters. This can be freely used for research and development, or restricted for controlled use in healthcare.

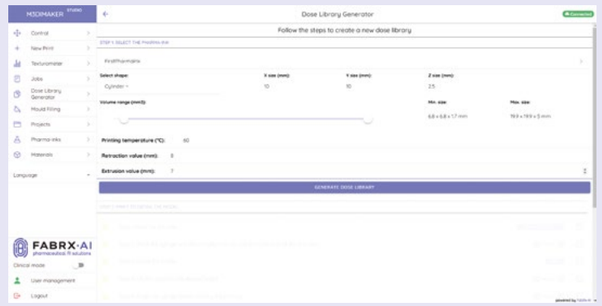
DATA SECURITY AND COMPLIANCE

- **Audit Trails** - Keep a complete record of all activities with built-in audit trails.
- **CFR 21 Part 11 Compliance** - Adhere to industry standards and regulatory requirements with confidence.
- **User Data Protection** - Prioritise user data privacy and protection, ensuring the confidentiality of sensitive information.
- **Batch Recording** - Maintain meticulous records with batch recording functionality, tracking crucial parameters such as temperature and pressure throughout the printing process.



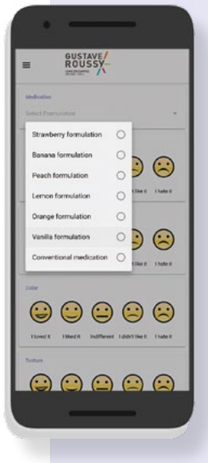
PROTOCOL LIBRARY

With our dose library generator, you can easily create and save your own dose protocols for your 3D printing needs.



M3DIFEEDBACK

M3DIFEEDBACK is a phone application that is designed to collect feedback from patients and parents/caregivers, giving medical professionals important patient acceptability data during studies. It can be tailored for each clinical project, making it an easy-to-navigate tool for both patients and medical professionals. Available now with a web app to manage the information gathered, deployed in our FABRX AI cloud or in the customer cloud to give you full control.



Log in. Then add and manage patients, using a code to identify them, mantaining their privacy.

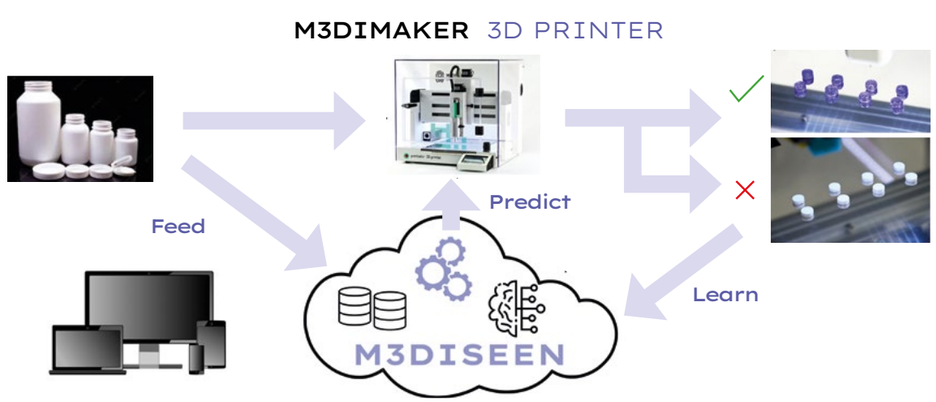
Patients can provide feedback on their experience with the clinical trial, making it easier to improve the process. This feedback can be exported to a CSV file, allowing for easy analysis and new insights.

M3DISEEN

Insert your combination of excipients and drugs and predict 3D printability, suggested printing parameters and potential dissolution.

Using a large-scale data-driven model, M3DISEEN is able to predict the 3D printability and physical properties of a pharma-ink.

M3DISEEN saves formulation development costs, reducing the trial-and-error approach of development, making it easier to start personalising medicines.



We collaborate with researchers and pharmacists from across the world

FABRX is involved in a number of pharmaceutical 3D printing projects for personalised medicine and clinical trial batch manufacture with research organisations, universities and pharmaceutical companies across the world. With our clinical experience and collaboration network, we can help facilitate the translation of exciting new projects.

Visit our website for a full list of publications and collaboration press releases.

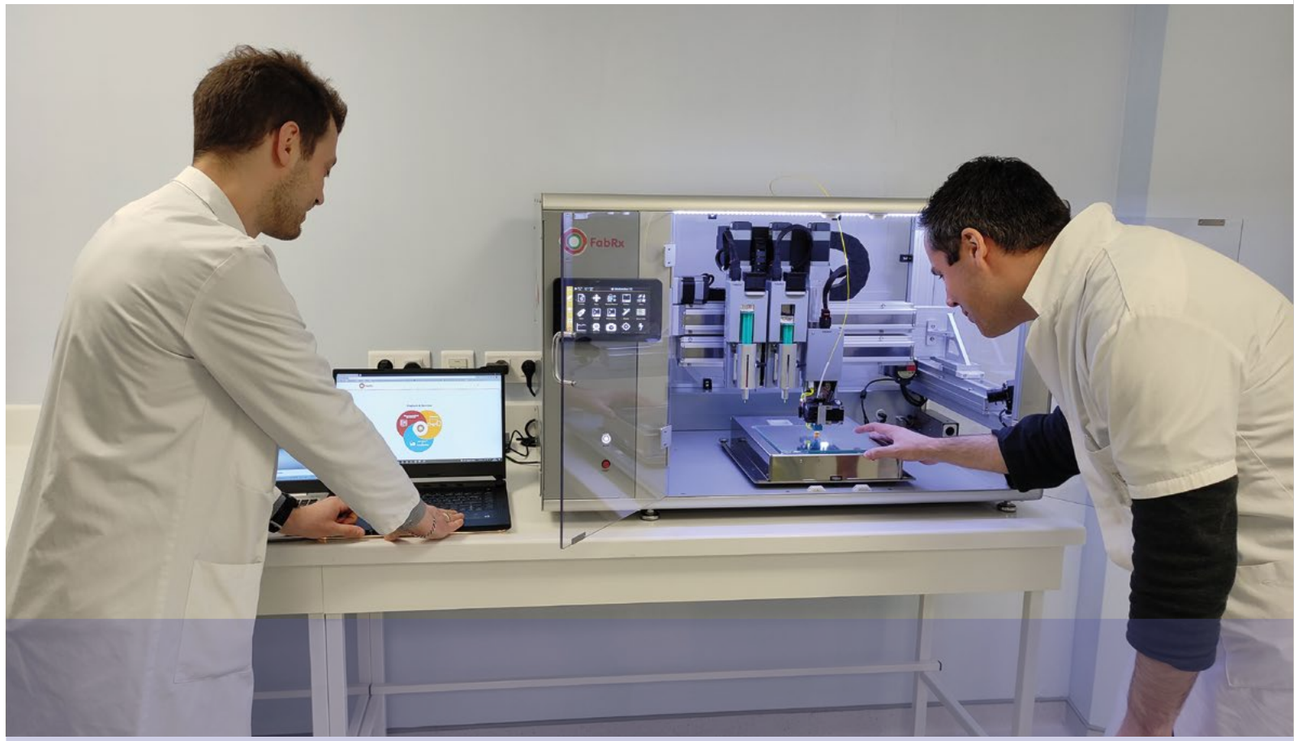


Photo © FABRX and Gustave Roussy Institute, Paris, France

Credit: Lithuanian University of Health Sciences, Faculty of Pharmacy

Pharma-ink development services

We offer flexible services to help you develop and optimise your pharma-ink formulations. From a quick video meeting consultation to full formulation development and analysis, our world leading team can help you.

Our Formulation Development Pathway

01 Choose your Active Ingredients

02 Active Ingredient Characterisation

03 Formulation Development

04 3D Printing Optimisation

05 In vitro Analysis

06 Small Batch Manufacture and Clinical Trial Guidance

Personalising healthcare to improve patient health and happiness

Get in touch to see how we can help you translate your ideas to the real world.

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Credit: University Medical Center Hamburg-Eppendorf/A. Kirchhof