

Modular-Lab LDF

Application: $^{90}\text{Y}/^{111}\text{In}$ -DOTA-peptides

Most of the neuroendocrine tumors carry a somatostatin receptor on the cell membrane. Blocking of this receptor with the somatostatin-analogue Octreotide leads frequently to an amelioration. The combination of the gamma emitter ^{111}In for the exact localization and dilatation of the tumor, together with the beta emitter ^{90}Y for metabolic therapy leads to the "new" radiotherapeutic $^{90}\text{Y}/^{111}\text{In}$ -DOTA-Tyr-Octreotide (DOTA-TOC).

Modular-Lab LDF allows the semi-automated production of $^{90}\text{Y}/^{111}\text{In}$ -DOTA-conjugated peptides (based on the procedure described by Prof. Dr. H. Maecke, University Hospital of Basel, Institute of Nuclear Medicine). This system allows the user to produce two doses of radiolabelled DOTA-conjugated peptides quickly and accurately with minimum radiation exposure to hospital personnel. The system is very compact (400 x 350 x 350) so it can easily fit into most hot cells.

The process includes the fully automated marking of ^{111}In and ^{90}Y together with DOTA-conjugated peptides and the preparation of the final patient syringes.

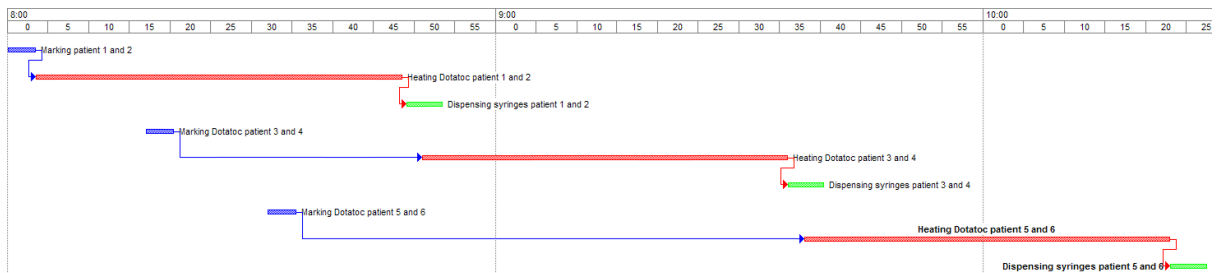
The configuration is shown below.



■ Modular-Lab LDF specifications for labelling of $^{90}\text{Y}/^{111}\text{In}$ -DOTA-peptides (heater is not included):

- Process time (two patient doses per run): 50 minutes (incl. heating)
- Max. number of patient doses per day/system: 30
- ^{90}Y yield: 99,73%
- Audit Trail of all settings and data (incl. heating)
- High reproducibility
- Minimizing radiation exposure
- Configurable for additional application

■ Process Flow Example:



■ Technical Data

Dimensions (W x D x H) of Standard Modular-Lab LDF	400 x 350 x 350 mm
Power supply and data transfer	bus technology (CAN Open) 115 V ~ 60 Hz or 230 V ~ 50 Hz
Power consumption	800 W
Syringes & Shielding	System is equipped with ready to use patient syringes, including acrylic shielding. Other shielding and other syringes upon request.
Rotary Table Module (RTM)	RTM can generally be equipped with up to 12 vial positions. For application with ^{111}In , ^{90}Y , DOTA-TOC, NaCl 6 vial positions are sufficient. Each vial type is fixed at the table with a specific adapter. Adapter material is part of the radiation protection and depends on the used nuclide.
Syringe Module (SYM2)	Up to 5 Syringe Modules may be placed around the RTM depending on the specific configuration.
Dosage accuracy	$\pm 5\%$
Vial volume	Variable from 5 – 15 mL
Syringe volume	Variable from 1 to 10 mL (syringes from different manufacturers can be used)
Software	Modular-Lab LDF Software (GMP, GAMP 4/5 and 21 CFR part 11 compliant)
Interfaces	Ethernet

Modular-Lab LDF may also be used for the automated filling of patient syringes with [^{18}F]FDG or [^{18}F]FEC. Other customized solutions are available upon request.

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