

- The NanoTek Chemistry System is a modular microfluidic chemistry system with the ability to combine both microscale and macroscale process steps. Modular components give the user maximum flexibility for both research and clinical applications.

Radiochemists* want tracer synthesis systems capable of:

- Higher final product yield
- Reduced synthesis time
- Undertaking many reactions per day
- Higher final product purity
- Synthesis of difficult tracers

Peer-reviewed publications show substantial advantages in each category when using the NanoTek Microfluidic Synthesis System.

► Higher final product yield

Tracer	NanoTek	Conventional
FEC	36%±5% non DC ¹	18 ±5% ²
Fallypride	88% ³	36.2% DC ⁵
FE@ Supply:2	79.2% ⁴	32.9% ⁴
F18 FAZA	87% ⁵	28% DC ⁵

► Reduced synthesis time/Undertake many reactions per day

Radiochemists have demonstrated microfluidic synthesis to be dramatically faster than conventional approaches. For example, 30 experiments were completed in one day from a single delivery of activity⁸.

Tracer	Completion
FLT	60 minutes
FMISO, Fallypride	45 minutes
FEC, FMC, FPC	13 - 15 minutes

Overall tracer production times including purification and formulation for pre-clinical/clinical purposes are rapid.

► Higher Final Product Purity

Flow reactors provide precise temperature control eliminating temperature gradients within the reactor. Only a small percentage of the total reaction volume is heated as it passes through the reactor and is then rapidly cooled to ambient as it exits minimizing by-product formation.

Tracer	Radiochemical Purity
FLT	>99% ⁶
FMISO	>97% ⁷
[11C]MC-0233	>99% ¹⁰
FEC	>95% ¹

► Synthesize Difficult Tracers

To date using the same system configuration users have synthesized successfully 30 18F tracers , 9 11C tracers and 3 incorporating 99mTc⁹.

* 80 attendees at Advion's microfluidic mini-symposium held at ISRS 2011 in Amsterdam completed a survey that asked what they want from future tracer synthesis systems.





References

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- ¹⁰Kealey, S., Plisson, C., Collier, T.L., Long, N.J., Husbands, S.M., Martarello, L., Gee, A. D. (2011) Microfluidic reactions using [11C]carbon monoxide solutions for the synthesis of a positron emission tomography radiotracer. *Organic & Molecular Chemistry*, (9), 3313-3319.