

# Best<sup>®</sup> Cyclotron Systems

## Turnkey solutions for radioisotope production in nuclear medicine



TeamBest Global Companies ©2023



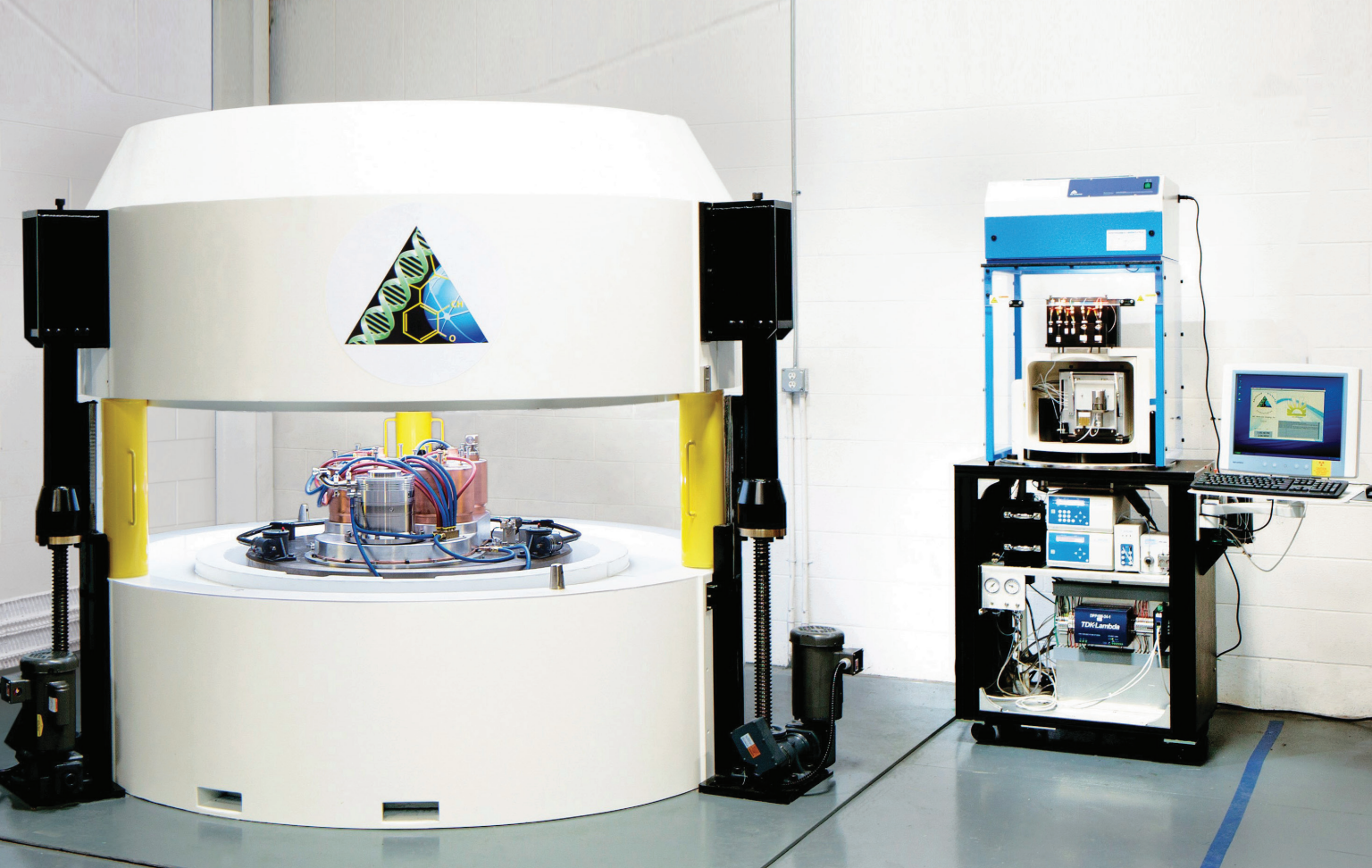
Best Medical International, Inc. 7643 Fullerton Road, Springfield, VA 22153 USA  
tel 703 451 2378 800 336 4970 [www.teambest.com](http://www.teambest.com) [www.bestcyclotron.com](http://www.bestcyclotron.com)



## Welcome to TeamBest®

TeamBest®, through Best Cyclotron Systems, Inc. (BCS), offers radioisotopes and production capabilities for nuclear medicine and radiotherapy with its range of cyclotron systems. BCS's mission is to create technology to provide healthcare options for various needs around the world. Our staff assists from the planning stage, detailed design, facility construction, daily production, maintenance and emergency repair through the TeamBest® network. We provide solutions for PET-CT and molecular imaging radiopharmaceuticals with the same excellent customized care as demonstrated in our 40+ year history of radiotherapy support.

TeamBest® provides a system that fits the needs of every customer. We offer a turnkey solution—not only the cyclotron, but also targets, automated radiochemistry, infrastructure, operations and maintenance support. As consistent supplies of radioisotopes become more uncertain, particularly for reactor-supplied isotopes, the Best family of cyclotrons provides a Total Solution™ for the medical community with less dependence on unreliable sources.



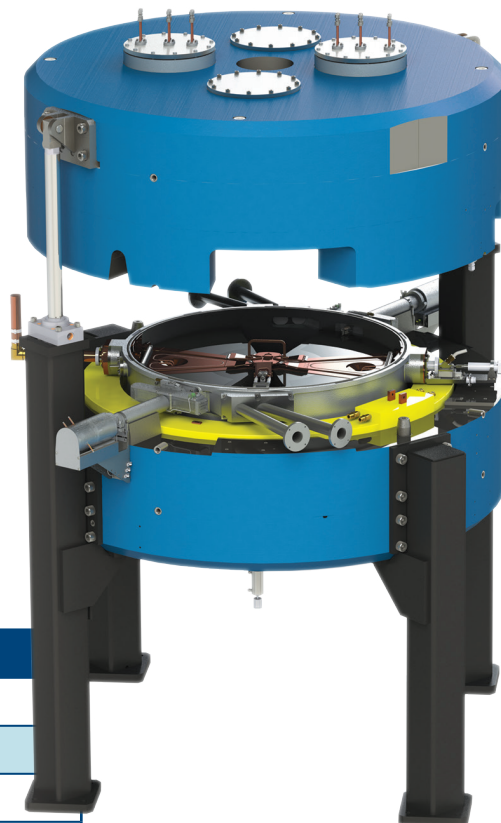
*Best*<sup>®</sup> Cyclotron Systems

## Best Sub-Compact Model 200 Self-Shielded Cyclotron

- Capable of producing:  $^{18}\text{F}$ FDG,  $\text{Na}^{18}\text{F}$ ,  $^{18}\text{F}$ -MISO,  $^{18}\text{F}$ FLT,  $^{18}\text{F}$ -Choline,  $^{18}\text{F}$ -DOPA,  $^{18}\text{F}$ -PSMA  $^{11}\text{C}$ ,  $^{13}\text{N}$ ,  $^{68}\text{Ga}$  and more!
- Single or batch dose production
- Final dose delivery to syringe or vial
- Automated quality control testing
- Complete production lab in a 5 x 5 meter area

# Best 6–15 MeV Compact High Current/ Variable Energy Proton Cyclotron

- 1–1000  $\mu\text{A}$  extracted beam current
- Capable of producing the following isotopes:  
 $^{18}\text{F}$ ,  $^{68}\text{Ga}$ ,  $^{89}\text{Zr}$ ,  $^{99\text{m}}\text{Tc}$ ,  $^{11}\text{C}$ ,  $^{13}\text{N}$ ,  $^{15}\text{O}$ ,  $^{64}\text{Cu}$ ,  $^{67}\text{Ga}$ ,  
 $^{111}\text{In}$ ,  $^{124}\text{I}$ ,  $^{225}\text{Ac}$ ,  $^{103}\text{Pd}$  and more!
- Up to  $5 \times 10^{13}$  neutrons per second from external target
- 21 stripping foils at each stripping port for two minute rapid change



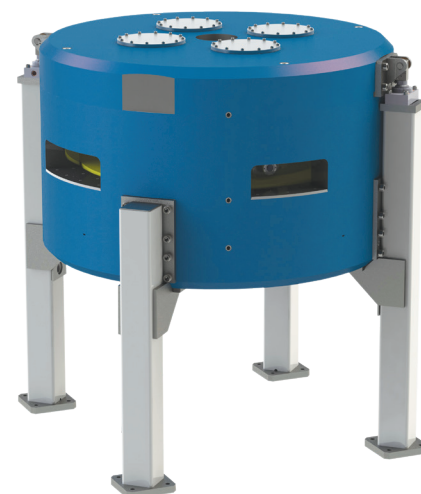
## ISOTOPE PRODUCTION CAPABILITIES

### Best 15 Isotopes

PET	
Isotope	Application
Carbon-11	Broad Substitution
Nitrogen-13	Ammonia: blood flow
Oxygen-15	Blood flow, volume, oxygen utilization
Fluorine-18 aqueous	FDG mainly, many others
Fluorine-18 gas	Radiolabeling from gas phase
Copper-64	Integration through chelation chemistry
Iodine-124	Monoclonal antibodies

SPECT	
Isotope	Application
Gallium-67	Fe analog, inflammatory lesions
Technetium-99m	Many

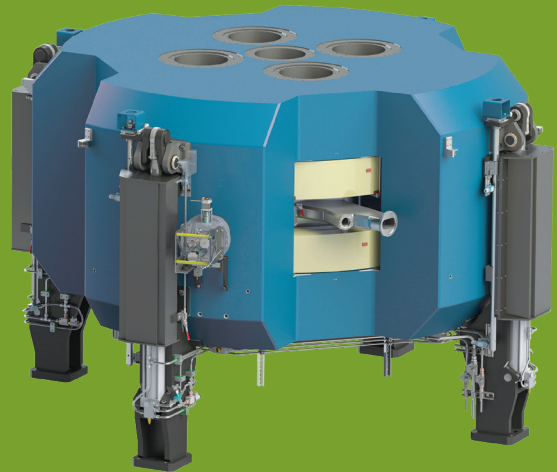
Therapeutic	
Isotope	Application
Palladium-103	Interstitial implants, brachytherapy



*\*Some of the products shown are under development and not available for sale currently.*

# Best Model B35adp Alpha/Deuteron/Proton Cyclotron for Medical Radioisotope Production and Other Applications

- **Proton Particle Beam:**  
1000  $\mu$ A Beam Current up to 35 MeV Energy
- **Deuteron Particle Beam:**  
500  $\mu$ A Beam Current up to 15 MeV Energy
- **Alpha Particle Beam:**  
200  $\mu$ A Beam Current up to 35 MeV Energy



## ISOTOPE PRODUCTION CAPABILITIES

### Best 25/28u/35 Isotopes

Isotope	Application
Iodine-123	Low dose imaging agent, replacing I <sup>131</sup>
Indium-111	Blood cell labeling
Gallium-68 (generator)	Blood-brain barrier integrity, tumor localization
Thallium-201	Myocardium functional assessment
Krypton-81m (generator)	Gas for ventilation imaging or in solution for perfusion imaging

*Plus all the isotopes the Best 15 can produce*



PHOTO: Assembly of Best 35 MeV Cyclotron at the Best Theratronics facility in Ottawa, Ontario, CN.

# Best 70 MeV Cyclotron Ideal for Sr-82/ Rb-82 Supply and Research

- 70-35 MeV variable energy  $H^-$  cyclotron
- 700  $\mu A$  extracted beam current (upgradable to 1000  $\mu A$ )
- 2 simultaneous extracted beams
- Multiple independent beam lines and target positions



## ISOTOPE PRODUCTION CAPABILITIES

### Best 70 Isotopes

Isotope	Application
Rubidium-82 (generator)	Diagnosis of coronary artery disease, coronary stenosis, myocardial infarction imaging, viability, collateral function and cardiomyopathy
Iodine-123	Low dose imaging agent, replacing $I^{131}$
Copper-67	Used in radiotherapy by accumulation in tumor tissue using monoclonal antibodies
Krypton-81m (generator)	Used either in gaseous form for ventilation imaging or in solution for perfusion imaging
<i>Research: Physics, chemistry, Radioactive Ion Beam, activation energy, etc.</i>	

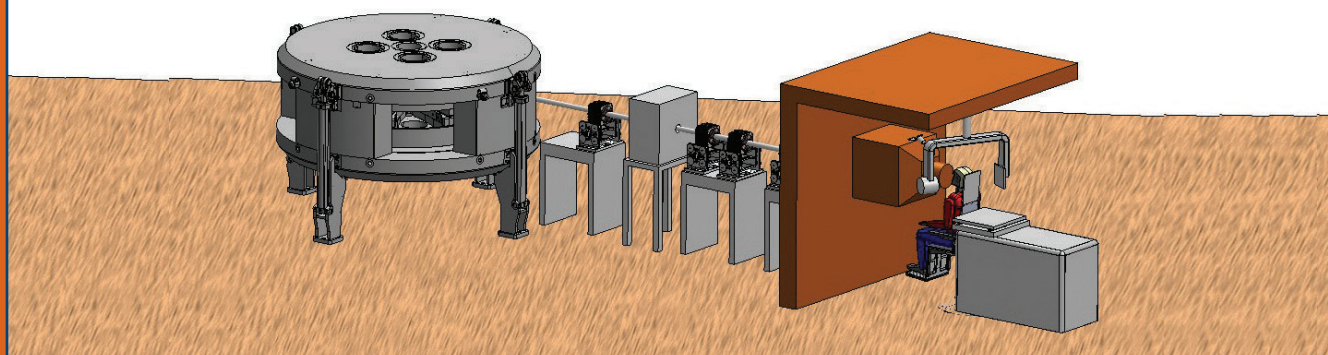


PHOTO: Installation of Best 70 MeV Cyclotron at INFN, Legnaro, Italy.

# Best Model 180p Cyclotron for Proton Therapy *(Patent Pending)*



- From 70 MeV up to 180 MeV
- Dedicated for Proton Therapy with two beam lines and two treatment rooms
- For all Medical Treatments including: Benign and Malignant Tumors, Neurological, Eye, Head/Neck, Pediatric, Lung Cancers, Vascular/Cardiac/Stenosis/Ablation, etc.

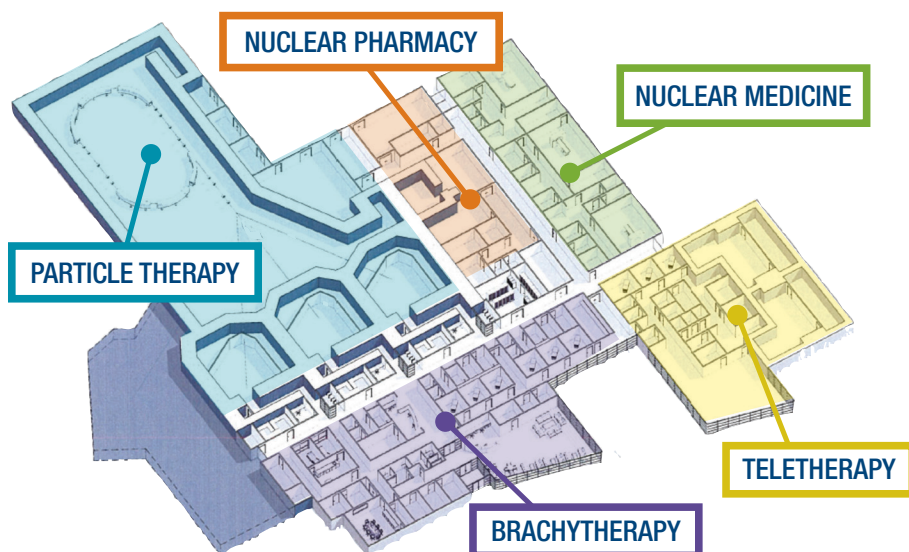


## Cyclotrons of Varying Energies

<b>Best Model 200</b>	<b>9 MeV</b>	Low energy, self-shielded compact system capable of producing: $^{18}\text{F}$ FDG, $\text{Na}^{18}\text{F}$ , $^{18}\text{F}$ -MISO, $^{18}\text{F}$ FLT, $^{18}\text{F}$ -Choline, $^{18}\text{F}$ -DOPA, $^{18}\text{F}$ -PSMA, $^{11}\text{C}$ , $^{13}\text{N}$ , $^{68}\text{Ga}$ and more!
<b>Best Cyclotrons</b>	<b>1–3 MeV</b>	Deuterons for materials analysis <i>(Patent Pending)</i>
	<b>70–150 MeV</b>	For Proton Therapy <i>(Patent Pending)</i>
	<b>3–90 MeV</b>	High current proton beams for neutron production and delivery <i>(Patent Pending)</i>
<b>Best 15p Cyclotron</b>	<b>1–15 MeV</b>	Proton only, capable of high current up to 1000 Micro Amps, for medical radioisotopes
<b>Best 20u/25p Cyclotrons</b>	<b>20, 15–25 MeV</b>	Proton only, capable of high current up to 1000 Micro Amps, for medical radioisotopes
<b>Best 35p/35adp Cyclotrons</b>	<b>15–35 MeV</b>	Proton or alpha/deuteron/proton, capable of high current up to 1000 Micro Amps, for medical radioisotopes
<b>Best 70p Cyclotron</b>	<b>35–70 MeV</b>	Proton only, capable of high current up to 1000 Micro Amps, for medical radioisotopes
<b>Best 180p Cyclotron</b>	<b>From 70 MeV up to 180 MeV</b>	For all Medical Treatments including Benign and Malignant Tumors, Neurological, Eye, Head/Neck, Pediatric, Lung Cancers, Vascular/Cardiac/Stenosis/Ablation, etc. <i>(Patent Pending)</i>

## Best Particle Therapy 400 MeV ion Rapid Cycling Medical Synchrotron (iRCMS) for Proton-to-Carbon, Variable Energy Heavy Ion Therapy, with or without Gantries – Single and Multi-Room Solutions

### Best Radiation Therapy and Diagnostic Center



- Intrinsically small beams facilitating beam delivery with precision
- Small beam sizes – small magnets, light gantries – smaller footprint
- Highly efficient single turn extraction
- Flexibility – heavy ion beam therapy (protons and/or carbon), beam delivery modalities

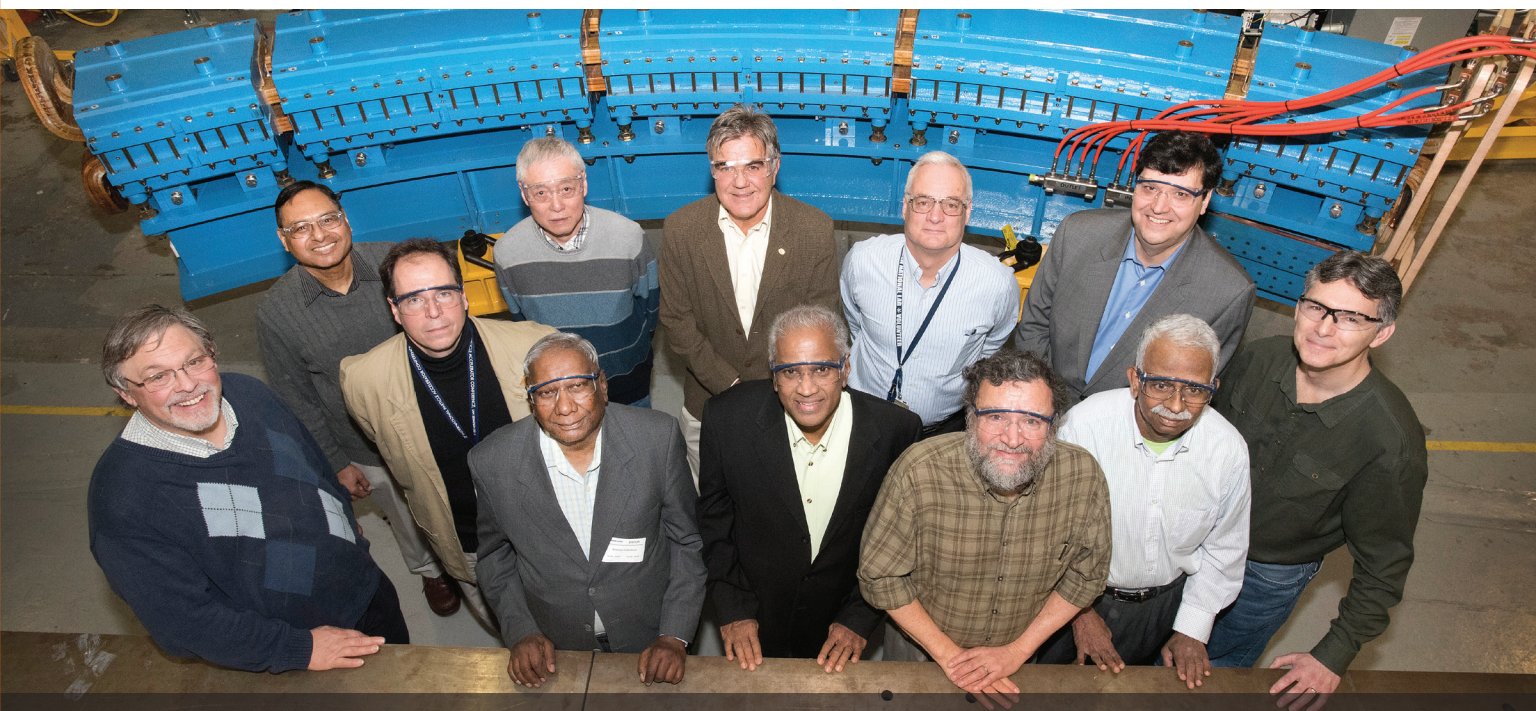


PHOTO: Prototype iRCMS Combined Function Magnet.