

# Actinium 225 & Lutetium 177 Isotope Production for Therapeutic Applications w/BEST Cyclotrons from BEST Medical Intl.

WASHINGTON, DC, USA, January 6, 2023 /EINPresswire.com/ -- Best Cyclotron Systems Inc., a TeamBest Global (TBG) Company, has designed and installed a variety of cyclotrons for medical, industrial and research applications ranging from energy 1 MeV to 70 MeV. Many of these cyclotrons can be used for production of Actinium-225 (Ac-225) and Lutetium-177 (Lu-177) isotopes that can potentially be useful for therapeutic applications. TBG and [Best Cure Foundation](#) are planning to manufacture many of these cyclotrons to establish production of a range of diagnostic and therapeutic radioisotopes for global distribution.

These radioisotopes have been introduced as the active alpha and beta particle sources in new radiotherapeutic drugs. Ac-225 is an alpha emitter and Lu-177 is a beta emitter—both have long enough half-lives suitable for therapy.

## Actinium-225

There has been great interest in targeted alpha therapy using Ac-225. In particular, prostate cancer patients have been treated Ac-225 with notable success[1]. It is expected that targeted alpha therapy can lead to remission; therefore efforts towards the production of Ac-225 have increased substantially.



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Ac-225 has a 10-day half-life and decays with the emission of an alpha particle, subsequently following a decay path with four alpha particles being emitted. Because of the very high linear energy transfer of alpha particles, a large radiation dose can be delivered to the tumor site.

Ac-225 can mainly be produced by two reactions. One is a proton induced spallation reaction at 70 MeV or higher using thorium as the production target. That reaction is accessible using the BEST B70 proton cyclotron. The second reaction is the proton induced (p,2n) reaction on Radium-226. This reaction can be utilized at proton energies from 10–30 MeV and therefore is a candidate for production on the BEST B15, B20, B25 and B35 MeV cyclotrons.

A typical BEST cyclotron can deliver more than 400  $\mu$ A extracted proton beam. Consequently, clinically useful quantities of Ac-225 can readily be produced, as individual therapeutic doses are typically below one millicurie.

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Our mission is to uphold our reputation for excellence in the healthcare field by developing, manufacturing and delivering cost-effective, high-quality products to benefit patients around the world.”

*Krishnan Suthanthiran,  
President/Founder of  
TeamBest Global Companies*

The irradiation system is based on the core solid target station offered by BEST for the B15, 20 and 25 MeV cyclotrons. The key feature to be considered is the isolation of the target and handling system from the environment to protect the laboratory personnel from the alpha emissions, not only from the produced Ac-225 but also from the Radon-222 present from the decay of radium. This radiation safety consideration is paramount in the operation of the target station adapted for Ac-225 production.

#### Lutetium-177

Lu-177 is a beta emitter with an 6.7 day half-life and is used as the radioactive ingredient in therapeutic drugs. Lu-177 can be produced by BEST B25, B35 and B70 cyclotrons which are



Best Cure Foundation — [www.bestcure.md](http://www.bestcure.md)



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equipped to accelerate deuteron beams using the (d, p) reaction. When the deuteron beam is accelerated with the present designs, the maximum deuteron energy obtained is one half the maximum proton energy.

A typical BEST cyclotron can deliver more than 300  $\mu\text{A}$  extracted deuteron beam. Consequently, clinically useful quantities of Lu-177 can readily be produced.

The targetry support equipment for solid metal targets used for the Actinium production can be used as well for Lutetium production.

A dual particle BEST cyclotron is designed to produce these two isotopes in Clinical quantities.

TBG companies in collaboration with the Best Cure Foundation plan to establish several Multi-specialty Cancer Centers to serve the needs of the global cancer population. These centers will incorporate many of the BEST cyclotrons discussed in this press release.

#### Reference

1. Kratochwil, C. et al, Targeted  $\alpha$ -Therapy of Metastatic Castration-Resistant Prostate Cancer with  $^{225}\text{Ac}$ -PSMA-617: Dosimetry Estimate and Empiric Dose Finding. Journal of Nuclear Medicine, 58(10) (2017) 1624. <https://jnm.snmjournals.org/content/58/10/1624>

For more information about Best Cyclotron Systems plans to establish 100s of Cyclotrons/PET CT & Full Diagnostic Centers in India beginning 2023, please read:

<http://www.teambest.com/press/EINPresswire-605153762-best-cyclotron-systems-plan-to-establish-100s-of-cyclotrons-pet-ct-full-diagnostic-centers-in-india-beginning-2023.pdf>

<http://www.teambest.com/press/EINPresswire-600803310-actinium-225-production-for-medical-applications-using-best-cyclotron-systems.pdf>

For more information about [Krishnan Suthanthiran](#), please visit his bio page at [http://www.teambest.com/about\\_bio.html](http://www.teambest.com/about_bio.html).



For more information about the BCF, please visit <http://www.bestcure.md>.

For more information about Krishnan Suthanthiran's presentation on Rethinking Medicine, please visit

[http://www.teambest.com/10\\_04\\_2022\\_Rethinking\\_Medicine\\_Invite\\_TX-FINAL.pdf](http://www.teambest.com/10_04_2022_Rethinking_Medicine_Invite_TX-FINAL.pdf)

About [TeamBest Global Companies](#):

TeamBest is a multinational medical company founded in 1977 in Springfield, Virginia, USA. TeamBest is driven by one primary goal—to provide the best products and services to customers.

The TeamBest family of companies, collectively known as Team Best Global, has been proudly developing, manufacturing, and delivering reliable medical equipment and supplies for more than 40 years. TeamBest includes over a dozen companies offering complementary products and services for brachytherapy, health physics, medical physics, radiation therapy, blood irradiation, vascular brachytherapy, imaging, medical particle acceleration, cyclotrons, and proton-to-carbon heavy ion therapy systems. TeamBest is the single source for an expansive line of life-saving medical equipment and supplies. Its trusted team is constantly expanding and innovating to provide the most reliable products and technologies.

Today, TeamBest employs hundreds of talented engineers, scientists and others, offering thousands of products and services. TeamBest's independently-owned companies are proud to be represented in North America, Europe, Latin America, Africa, the Middle East and Asia.

"Everyone deserves the Best healthcare. Our goal is to work with medical professionals to provide the Best products, technologies and services. Our mission is to uphold our reputation for excellence in the healthcare field by developing, manufacturing and delivering cost-effective, high-quality products to benefit patients around the world," states Krishnan Suthanthiran.

Krishnan Suthanthiran - President & Founder

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