

Voyageur Pharmaceuticals Ltd and Rain Cage Carbon Inc, Announce Breakthrough in Imaging Technology with Vanadium Fullerene Molecule

written by Raj Shah | December 21, 2023

December 21, 2023 ([Source](#)) – Voyageur Pharmaceuticals Ltd. (TSX.V:VM) (USA:VYYRF) (“Voyageur” or the “Corporation”), a provider of innovative medical imaging solutions, is excited to announce that its carbon capture and drug development partner, **Rain Cage Carbon Inc.** (“Rain Cage”), has successfully completed Stage 1 testing of a new molecule, metallofullerene, for the medical imaging industry. This significant milestone has major implications for the radiology market:

1. Metallofullerene has been proven to be a superior MRI contrast agent compared to those currently in the market.
2. Metallofullerene, based on its molecular structure, has the potential to be safer than current drugs in the market.
3. The high relaxivity and the multifaceted benefits of metallofullerenes highlight their potential to substantially enhance MRI diagnostics.
4. Voyageur and RainCage now have a platform to create a diversified pipeline of new carbon-based drugs for diagnostic imaging, that among others, includes a combination of iodine with fullerene and theranostic radiology drugs.
5. The drugs will be 100% carbon neutral and will be

developed for the global market.

Voyageur is the only pharmaceutical company to have access to fullerene and vanadium at no sourcing cost because of its drug development agreement with Rain Cage. The agreement provides for Voyageur and Rain Cage to share future revenue from drug sales. Voyageur has rights for carbon imaging drug development and sales for North America. Cost of carbon and other minerals created by the Rain Cage technology are a by-product of carbon capture from fossil fuel emissions.

Voyageur is in talks currently with potential drug development research firms to launch the drug development program. However, their clinical adoption is contingent upon continued research, clinical validation to confirm their safety and efficacy and regulatory approvals.

The development of metallofullerene-based MRI contrast agents is a significant breakthrough that has the potential to be a game changer and disruptive to the medical imaging market. Gadolinium fullerene drugs can offer up to 50 times greater relaxivity than conventional gadolinium-based MRI contrast agents like Omniscan® and Magnevist®. <https://pubmed.ncbi.nlm.nih.gov/19445504/>. The unique structural advantages of metallofullerenes allow for lower dosing, enhanced image quality, and potentially fewer side effects.

Rain Cage's pioneering use of Vanadium in the creation of metallofullerenes at a commercial scale paves the way for further innovations with other metals to boost radiological applications. Future testing by Voyageur on Vanadium for relaxivity and safety will commence upon financing, with the R&D program and pre-clinical research starting in 2024.

Rain Cage has successfully created a novel Vanadium fullerene

molecule, designed to enhance diagnostic imaging, and have completed Stage 1 testing for commercial synthesis stability.

Blair Aiken, Chairman of Rain Cage Carbon, stated – *“Not only is Vanadium an expensive and difficult material to procure but has been shown to have particularly beneficial properties in MRI and X-Ray applications. Our carbon capture system can extract that material from vanadium-rich emissions sources from oil producers and has been successfully integrated into our advanced carbon material. The result is a development that can potentially convert fossil fuel emissions into life-saving applications. Our data results are most encouraging – when tested, the response from the carbon molecules amplified the trace Vanadium in the samples to register as if the entire sample was pure Vanadium”*.

Extensive research has been documented at the National Institute of Health’s National Library of Medicine <https://pubmed.ncbi.nlm.nih.gov/?term=fullerene+contrast>. This underscores the superior performance of these novel agents, providing a clear indication of their potential to revolutionize contrast-enhanced MRI by improving sensitivity and reducing toxicity. While the real-world application of these findings is still being explored, the promise they hold for future drug development and enhanced diagnostic capabilities is clear.

Key advantages of metallofullerenes in MRI include:

- Superior contrast and image quality, enabling clearer differentiation of tissues and identification of conditions like tumors.
- Extended blood retention time for prolonged diagnostic windows.
- Lower toxicity, reducing the risk of side effects, a significant benefit for patients with renal impairment.

- The capability for targeted imaging to improve diagnostic accuracy for specific types of cancers or brain disorders.
- Chemical stability, minimizing the release of potentially harmful free gadolinium ions.
- Versatility for multimodal imaging, allowing for a more comprehensive diagnostic approach.

Brent Willis, CEO of Voyager states *“this is a monumental day for Voyager, we can now proceed with one of the most exciting R&D projects in the pharmaceutical industry. The company now has potential to create new drugs using low-cost carbon capture, creating valuable molecules, utilising low-cost fossil fuel. By becoming 100% carbon neutral utilising Rain Cage technology and creating revenue from carbon capture, fullerene production and carbon credit generation, Voyager is poised to change the landscape in this market. This new technology aligns with Voyagers plan to vertically integrate the radiology drug market with its Earth to Bottle strategy and become a highly competitive pharmaceutical company”*.

What is Fullerene?

Carbon fullerene, also known simply as fullerene, is a molecule composed entirely of carbon atoms, arranged in the form of a hollow sphere, ellipsoid, tube, or other geometric shapes. The most common and well-known type of fullerene is the buckyball, which resembles a soccer ball with a pattern of hexagons and pentagons. Fullerene is a critical strategic mineral and has applications in multiple industries. Fullerenes currently sell for \$320,000 a kg and Rain Cage is the first company to manufacture at scale and cost that allows fullerene to begin to be utilized by industry.

In simpler terms, imagine tiny building blocks called atoms.

Carbon fullerene is a special type of molecule made up of only carbon atoms, which are like the Lego pieces of the molecular world. Fullerene comes in various shapes like spheres, ellipsoids, or tubes. Picture a tiny, hollow ball or tube made entirely of carbon atoms.

Fullerene has a unique structure, and its discovery opened new possibilities in the world of materials and nanotechnology. It has exceptional properties, such as high strength and conductivity. These properties make it useful in various fields, including electronics, medicine, and materials science.

About Rain Cage Carbon Inc.

Rain Cage Carbon <https://raincagecarbon.com/> is a private Canadian company dedicated to decarbonizing industries by capturing CO₂ and other emissions and transforming them into engineered carbons. Through its proprietary technologies, it offers companies a groundbreaking solution to combat carbon pollution and add value to other products worldwide. Rain Cage Carbon's unique approach not only helps mitigate emissions but also harnesses contaminating emissions by converting them into a recyclable technology with countless applications.

About Voyageur Pharmaceuticals Ltd.

Voyageur, a Canadian public company trading under the symbol VM on the TSX Venture Exchange, is in development of barium, iodine and carbon Active Pharmaceutical Ingredients (API) and high-performance, cost-effective imaging contrast agents. With a strategic focus on vertically integrating the barium, iodine and carbon contrast imaging market, Voyageur aims to become a key player by producing its own barium, iodine, and fullerene minerals.

Voyageur's business plan is set to generate cash flow by

partnering with established third-party GMP pharmaceutical manufacturers in Canada, ensuring the validation of its products by regulatory agencies worldwide. As the Corporation solidifies its presence in the market, it will transition into a high-margin domestic manufacturer of radiology drugs, further expanding its revenue streams.

Voyageur is committed to sustainability and environmental stewardship. The Corporation envisions a future where carbon neutrality is the norm, and to achieve this, it plans to build state-of-the-art carbon-neutral infrastructure. By investing in carbon neutral energy sources and sustainable manufacturing practices, it aims to become 100% carbon neutral across all its manufacturing activities. Voyageur's commitment to the environment sets it apart as a pioneer in the industry.

At the core of the Corporation's operations, Voyageur owns a 100% interest in a barium sulphate (barite) projects, the Frances Creek property. Additionally, Voyageur holds interests in a high-grade iodine, lithium, and bromine brine project situated in Utah, USA, further bolstering its position in the industry. Voyageur also owns a 100% interest in two battery mineral projects which focus on copper/zinc development.

Voyageur's ambitious vision is to become the first vertically integrated, carbon-neutral company in the imaging contrast media drug market. By controlling all primary input costs, from the sourcing of raw materials to final production, it plans to ensure unmatched quality and cost efficiency. Voyageur embodies the motto of **"From the Earth to the Bottle,"** highlighting its commitment to responsible sourcing and manufacturing practices.

For Further Information:

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This news release may contain certain forward-looking information and statements, including without limitation, statements pertaining to the perceived benefits to Voyageur from the Stage 1 testing of metallofullerene, Voyageur’s timing and expectations with respect to developing pharmaceutical drugs using metallofullerene and vanadium, Voyageur’s perceived costs and other benefits from its partnership with Rain Cage, Voyageur’s anticipated plans and benefits from its relationship with Rain Cage, Voyageur’s expectation that it will be able to secure the financing necessary to pursue its objectives, and other statements herein, which expressly or impliedly speak to Voyageur’s expectations for its business and operations. All statements included herein, other than statements of historical fact, are forward-looking information and such information involves various risks and uncertainties, including, without limitation, global market factors and supply chain issues, risks relating to the regulation and approval of Voyageur’s products, and general risks relating to Voyageur’s business. There can be no assurance that such information will prove to be accurate, and actual results and future events could differ materially from those anticipated in such information. A description of assumptions used to develop such forward-looking information and a description of risk factors that may cause actual results to differ materially from forward-looking information can be found in the Company’s disclosure documents on the SEDAR+ website at

www.sedarplus.ca. Voyageur does not undertake to update any forward-looking information except in accordance with applicable securities laws.