UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 6-K

REPORT OF FOREIGN PRIVATE ISSUER
PURSUANT TO RULE 13a-16 OR 15d-16 OF
THE SECURITIES EXCHANGE ACT OF 1934

For the month of December 2010

Commission File Number: 001-34949

Tekmira Pharmaceuticals Corporation

(Translation of Registrant's Name Into English)

100-8900 Glenlyon Parkway
Burnaby, British Columbia
Canada, V5J 5J8
(Address of Principal Executive Offices)

(Indicate by check mark whether the registrant files or will file annual reports under cover of Form 20-F or Form 40-F.)

Form 20-F ☒ Form 40-F ☐

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1): ☐

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7): ☐

Indicate by check mark whether the registrant by furnishing the information contained in this form is also thereby furnishing the information to the Commission pursuant to Rule 12g3-2(b) under the Securities Exchange Act of 1934.

Yes ☐ No ☒

If "Yes" is marked, indicate below the file number assigned to the registrant in connection with Rule 12g3-2(b): _____

EXHIBITS

The following exhibit is a press release issued by Tekmira Pharmaceuticals Corporation:

Exhibit Number	Description
99.1	Press release dated December 22, 2010

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

TEKMIRA PHARMACEUTICALS CORPORATION
(Registrant)

Date: December 22, 2010

By: /s/ Ian C. Mortimer
Name: Ian C. Mortimer
Title: Executive Vice President, Finance and Chief Financial Officer

Tekmira Initiates TKM-PLK1 Phase 1 Human Clinical Trial

For immediate release: **December 22, 2010**

VANCOUVER, BC – Tekmira Pharmaceuticals Corporation (Nasdaq: TKMR, TSX: TKM), a leading developer of RNA interference (RNAi) therapeutics, announced today it has initiated patient dosing in a Phase 1 human clinical trial for its lead oncology product, TKM-PLK1. TKM-PLK1 targets polo-like kinase 1, or PLK1, a cell cycle protein involved in tumor cell proliferation and a validated oncology target. Inhibition of PLK1 prevents the tumor cell from completing cell division, resulting in cell cycle arrest and cancer cell death.

Dr. Mark J. Murray, Tekmira's President and CEO, said, "We are pleased to have progressed to the point of initiating this Phase 1 human clinical trial for our lead oncology product. TKM-PLK1 has demonstrated anti-tumor efficacy in preclinical models of liver cancer as well as tumors outside the liver, supporting our strong belief that PLK1 represents an excellent target for RNAi. The commencement of this trial is a significant milestone for Tekmira. We are excited to move forward and expect to be in a position to report interim data from the Phase 1 trial in the second half of 2011."

The Phase 1 clinical trial, conducted at three medical centers in the United States, will be an open label, multi-dose, dose-escalation study designed to evaluate the safety, tolerability and pharmacokinetics of TKM-PLK1 as well as the determination of the maximum tolerated dose. The trial will enroll up to 52 patients with advanced solid tumors. Secondary objectives of the trial will be to measure tumor response as well as the pharmacodynamic effects of TKM-PLK1 in patients providing biopsies.

In addition to the Phase 1 human clinical trial, Tekmira is continuing discussions with the United States National Cancer Institute to design a second clinical trial to directly measure PLK1 knockdown and RNAi activity.

TKM-PLK1 consists of a Tekmira proprietary lipid nanoparticle (LNP) formulation that encapsulates small interfering RNA (siRNA) designed to silence PLK1. TKM-PLK1 has been shown in preclinical animal studies to selectively kill cancer cells, while sparing normal cells in healthy tissue. PLK1 plays a key role in a number of significant cancer indications including colorectal, breast, non-small cell lung, and ovarian cancers. These diseases collectively affect more than 500,000 new patients each year in the United States.

About RNAi and Tekmira's LNP Technology

RNAi therapeutics have the potential to treat a broad number of human diseases by "silencing" disease causing genes. The discoverers of RNAi, a gene silencing mechanism used by all cells, were awarded the 2006 Nobel Prize for Physiology or Medicine. RNAi therapeutics, such as "siRNAs," require delivery technology to be effective systemically. LNP technology is one of the most widely used siRNA delivery approaches for systemic administration. Tekmira's LNP technology (formerly referred to as stable nucleic acid-lipid particles or SNALP) encapsulates siRNAs with high efficiency in uniform lipid nanoparticles that are effective in delivering RNAi therapeutics to disease sites in numerous preclinical models. Tekmira's LNP formulations are manufactured by a proprietary method that is robust, scalable and highly reproducible and LNP-based products have been reviewed by multiple FDA divisions for use in clinical trials. LNP formulations comprise several lipid components that can be adjusted to suit the specific application.

About Tekmira

Tekmira Pharmaceuticals Corporation is a biopharmaceutical company focused on advancing novel RNAi therapeutics and providing its leading lipid nanoparticle delivery technology to pharmaceutical partners. Tekmira has been working in the field of nucleic acid delivery for over a decade and has broad intellectual property covering LNPs. Further information about Tekmira can be found at www.tekmirapharm.com. Tekmira is based in Vancouver, B.C.

Forward-looking Statements and Information

This press release contains “forward-looking statements” or “forward-looking information” within the meaning of applicable securities laws (collectively, “forward-looking statements”). Forward-looking statements are generally identifiable by use of the words “believes,” “may,” “plans,” “will,” “anticipates,” “intends,” “budgets”, “could”, “estimates”, “expects”, “forecasts”, “projects” and similar expressions, and the negative of such expressions. Forward-looking statements in this news release include statements about Tekmira’s strategy, future operations, clinical trials, prospects and plans of management; Tekmira’s RNAi product development programs; the effects of TKM-PLK1 as a treatment of cancer; the timing for publication of interim data for the TKM-PLK1 Phase 1 clinical trial; and discussions with the United States National Cancer Institute to design a second trial to directly measure PLK1 knockdown and RNAi activity.

With respect to the forward-looking statements contained in this news release, Tekmira has made numerous assumptions regarding, among other things: LNP’s status as a leading RNAi delivery technology and the effectiveness of Tekmira’s TKM-PLK1 product candidate as a treatment for cancer. While Tekmira considers these assumptions to be reasonable, these assumptions are inherently subject to significant business, economic, competitive, market and social uncertainties and contingencies.

Additionally, there are known and unknown risk factors which could cause Tekmira’s actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements contained herein. Known risk factors include, among others: the possibility that other organizations have made advancements in RNAi delivery technology that Tekmira is not aware of and Tekmira’s development programs, including TKM-PLK1, will not result in expected results on a timely basis, or at all.

A more complete discussion of the risks and uncertainties facing Tekmira appears in Tekmira’s Short Form Base Shelf Prospectus dated November 4, 2010 available at www.sedar.com. All forward-looking statements herein are qualified in their entirety by this cautionary statement, and Tekmira disclaims any obligation to revise or update any such forward-looking statements or to publicly announce the result of any revisions to any of the forward-looking statements contained herein to reflect future results, events or developments, except as required by law.

Contact Information

Investors
Adam Peeler
The Equicom Group
Phone: 416-815-0700 x 225
Email: apeeler@equicomgroup.com

Ian Mortimer
Executive Vice President and Chief Financial Officer
Phone: 604-419-3200

Media
David Ryan
Longview Communications Inc.
Phone: 604-562-5895
Email: dryan@longviewcomms.ca