

Healthcare Sector Diagnostics Division

Siemens Forms New Companion Diagnostics Partnerships with ViiV Healthcare and Tocagen

Siemens' move into the companion diagnostics market targets the development of novel diagnostics tests for physicians treating HIV and brain cancer

Research Triangle Park, N.C., San Diego, Tarrytown, N.Y., February 7, 2012 – Siemens Healthcare Diagnostics announces two new companion diagnostics partnerships with pharmaceutical companies ViiV Healthcare and Tocagen — marking a major step for Siemens into this important and fast-growing segment of the in vitro diagnostics (IVD) market. Both partnerships intend to leverage the clinical trial and commercialization options within Siemens' CLIA laboratory, as well as Siemens' established IVD clinical and regulatory expertise.

Siemens' partnership with ViiV Healthcare will focus on clinical trials related to Celsentri/Selzentry® (maraviroc) — ViiV Healthcare's novel CCR5 co-receptor antagonist for the treatment of CCR5-tropic HIV — followed by potential commercialization of a diagnostics test to assist in patient selection prior to physician treatment decisions, subject to FDA approval. According to the World Health Organization, 33.3 million people worldwide were living with HIV as of 2009. That same year, 2.6 million new infections were reported and 1.8 million people worldwide died of AIDS-related illnesses.

The Siemens - Tocagen relationship will begin with diagnostic tests to support clinical trials related to Tocagen's unique viral gene therapy (Toca 511 & Toca FC) under investigation for the treatment of primary brain cancer, followed by potential commercialization of diagnostic tests for therapy monitoring, subject to FDA approval. According to the American Cancer Society, primary brain and central nervous system cancers are expected to account for 22,910 new cases and 13,700 deaths in 2012. Additionally, the National Institutes of Health estimates that 10-30% of all adults with cancer will develop brain metastases.

Widely considered a major step towards the vision of personalized healthcare, companion diagnostics are clinical tests linked to a specific drug or therapy intended to assist physicians in making treatment decisions for their patients. The technology and science behind the field allows pharmaceutical drug developers to identify subpopulations of patients more or less likely to respond favorably to a particular

drug or therapy, and those more or less likely to experience unfavorable side effects.¹ The companion diagnostics market, worth an estimated \$1.5 billion annually, is reportedly the fastest growing segment in the IVD industry, due largely to demand for safer, higher quality drugs.²

Complementing a move into next-generation sequencing, Siemens' companion diagnostics business will establish relationships with pharmaceutical companies to offer clinical trial expertise as well as diagnostic test development and commercialization. The company's CLIA-certified clinical lab in Berkeley, California is capable of offering a broad range of nucleic acids and immunoassay tests, as well as developing new test approaches as required.

"Siemens' presence in the emerging companion diagnostics market enables us to leverage our innovation capabilities and deep clinical knowledge to help improve pharmaceutical drug safety and effectiveness," said Michael Reitermann, CEO, Siemens Healthcare Diagnostics. "More so, it helps align Siemens with new classes of therapies tailored to the individual that hold the promise of improving patient care and delivering on the goal of personalized medicine."

ViiV Healthcare previously announced the start of the Phase III MODERN Study [Maraviroc Once daily with Darunavir Enhanced by Ritonavir in a Novel regimen], also known as A4001095, comparing its CCR5-inhibitor, Celsentri/Selzentry® (maraviroc), to emtricitabine/tenofovir (Truvada®), both in combination with darunavir/ritonavir. The 96-week trial will evaluate a two-drug versus three-drug once-daily regimen for the treatment of antiretroviral-naïve patients infected with CCR5-tropic HIV-1.

In addition, MODERN is the first large Phase III trial that will compare the performance of a genotypic test with a phenotypic test in identifying patients appropriate for use of Celsentri/Selzentry®. Patients will be randomised to undergo screening with either the genotypic or phenotypic test. Genotypic tropism testing in the MODERN study is provided by Siemens Healthcare Diagnostics as part of this partnership and phenotypic testing (Trofile®) by Monogram Biosciences. Subject to FDA approval, Siemens Healthcare Diagnostics may commercialize their genotypic tropism diagnostic test.

"Our partnership with Siemens Healthcare Diagnostics is a valuable part of our commitment to addressing patient needs through developing innovative treatment approaches," said Dr. John Pottage, Chief Scientific and Medical Officer, ViiV Healthcare. "Celsentri/Selzentry is an important treatment option for people living with CCR5-tropic HIV and we continue to support the evolution of tropism testing to provide physicians with accurate, accessible and affordable companion diagnostics."

Tocagen is enrolling patients in its clinical trials of Toca 511 (vocimagene amiretrorepvec), for injection & Toca FC (flucytosine), extended-release tablets. These multicenter, open-label studies¹ are in patients with recurrent high-grade glioma, such as those with glioblastoma multiforme (GBM, Grade 4), who have had prior surgery and chemoradiation. Toca 511 is a retroviral replicating vector (RRV) that is designed to deliver a cytosine deaminase (CD) gene selectively to cancer cells. After allowing time for the administered Toca 511 to spread through the tumor, those cancer cells expressing the CD gene may convert the antibiotic flucytosine into the anti-cancer drug 5-fluorouracil (5-FU). In these studies, patients receive multiple cycles of oral Toca FC. Tocagen plans to work with Siemens Healthcare Diagnostics on the assays used during these clinical studies. Subject to FDA approval, Siemens may commercialize diagnostic tests capable of monitoring patient levels of Toca 511 and Toca FC.

“We believe that developing the necessary diagnostic tests with the right diagnostic partner is an important component for the successful commercialization of Toca 511 & Toca FC,” said Harry E. Gruber, CEO, Tocagen Inc. “Siemens’ capabilities in developing commercial viral assays in addition to their market presence in the diagnostics space make them an excellent complement to Tocagen’s focus on the development and commercialization of viral gene transfer products to treat advanced cancer.”

These partnerships reflect Siemens’ efforts to expand its healthcare global presence by leveraging the power of in vivo and in vitro diagnostics to impact therapeutics – one goal of the recently launched Siemens Agenda 2013, a new two-year global initiative to further strengthen the innovative power and competitiveness of the Siemens Healthcare Sector.

¹ <http://www.dddmag.com/article-Companion-Prospecting-91211.aspx> (accessed on 10/6/11)

² <http://www.prnewswire.com/news-releases/companion-diagnostics-world-market-outlook-2011-2021-130615878.html>, <http://www.visiongain.com> (accessed on 10/6/11)

³ <http://clinicaltrials.gov/ct2/results?term=tocagen>

ViiV Healthcare is a global specialist HIV company established by GlaxoSmithKline (LSE: GSK.L) and Pfizer (NYSE: PFE) to deliver advances in treatment and care for people living with HIV. Our aim is to take a deeper and broader interest in HIV/AIDS than any company has done before, and take a new approach to deliver effective and new HIV medicines as well as support communities affected by HIV. For more information on the company, its management, portfolio, pipeline and commitment, please visit: www.viivhealthcare.com.

Tocagen Inc. is a privately funded, clinical stage biopharmaceutical company pursuing the discovery, development and commercialization of gene transfer products for the treatment of cancer. Tocagen is initially focusing on treatments for patients with advanced cancer for whom no adequate treatments currently exist. Toca 511 & Toca FC, the company's lead investigational combination product candidate, is being evaluated in clinical trials in patients with recurrent high grade glioma (such as glioblastoma multiforme). Tocagen has received grant support from leading brain cancer foundations including, Accelerate Brain Cancer Cure (ABC2), the American Brain Tumor Association (ABTA), and the National Brain Tumor Society (NBTS). For more information about Tocagen or Toca 511 please visit: www.tocagen.com.

The **Siemens Healthcare Sector** is one of the world's largest suppliers to the healthcare industry and a trendsetter in medical imaging, laboratory diagnostics, medical information technology and hearing aids. Siemens offers its customers products and solutions for the entire range of patient care from a single source – from prevention and early detection to diagnosis, and on to treatment and aftercare. By optimizing clinical workflows for the most common diseases, Siemens also makes healthcare faster, better and more cost-effective. Siemens Healthcare employs some 51,000 employees worldwide and operates around the world. In fiscal year 2011 (to September 30), the Sector posted revenue of 12.5 billion euros and profit of around 1.3 billion euros. For further information please visit: www.siemens.com/healthcare.

###