

## 22nd Century Proposes Nicotine-Free Cigarettes Be Considered in FDA Tobacco Regulation Bill

### Company Has Developed New and Improved Nicotine-Free Tobacco Plants

WILLIAMSVILLE, N.Y.--(BUSINESS WIRE)--Sen. Edward M. Kennedy, chairman of the Senate Health Committee, and Rep. Henry A. Waxman, chairman of the House Oversight and Government Reform Committee, are expected to introduce a bill that would empower the Food and Drug Administration (FDA) to regulate tobacco products. Currently the FDA regulates smoking cessation products but not tobacco products per se.

In previous congressional attempts to grant the FDA regulatory control over tobacco products, it was debated whether the FDA should have the authority to compel cigarette manufacturers to reduce nicotine levels, including reductions all the way to zero. 22nd Century Limited, LLC ("22nd Century") believes that although reducing nicotine yield of cigarettes at a greater rate than reducing tar yield would in general be detrimental to public health, nicotine-free brand extensions of the best-selling brand families could play a pivotal role in increasing smoking-cessation rates.

Nicotine-free cigarettes used as a bridge towards smoking cessation may be more effective than current FDA-approved smoking-cessation products such as nicotine patches.<sup>1-3</sup> Vector Group Ltd. stated in its 2005 annual report, "In October 2003, we announced that Jed E. Rose, Ph.D., Director of Duke University Medical Center's Nicotine Research Program and co-inventor of the nicotine patch, had conducted a study at Duke University Medical Center to provide preliminary evaluation of the use of the QUEST technology as a smoking cessation aid. In the preliminary study on QUEST, 33% of QUEST 3 smokers were able to achieve four-week continuous abstinence, a standard threshold for smoking cessation."<sup>1</sup>

Studies on nicotine-free and denicotinized cigarettes also demonstrate that the effectiveness of nicotine replacement products, such as nicotine patches, could be improved by these types of cigarettes.<sup>1 3-6</sup> Whether nicotine-free cigarettes are used alone or in conjunction with nicotine patches, the treatment breaks the association of sensory and behavioral cues of cigarette use with the rapid delivery of nicotine that occurs with conventional cigarettes. Moreover, nicotine-free cigarettes relieve cravings for conventional cigarettes.<sup>7-9</sup>

Vector Group Ltd. stated in last quarterly report, "In March 2006, Vector Tobacco concluded a randomized, multi center phase II clinical trial to further evaluate QUEST technology as an effective alternative to conventional smoking cessation aids. The study was designed with input from the Food and Drug Administration ("FDA"). In July 2006, we participated in an end-of-phase II meeting with the FDA where we received significant guidance and feedback from the agency with regard to development of the QUEST technology. The FDA provided guidance associated with future testing and data development, including the necessary duration of phase III clinical trials for the QUEST technology. Based in part on the feedback received from the FDA, the company is currently refining and evaluating commercial strategies and clinical development strategies for the QUEST smoking cessation project."<sup>4</sup>

If and when the FDA confirms the efficacy of nicotine-free cigarettes as an aid to smoking cessation, these nicotine-free products could be sold and labeled with an FDA-approved claim such as, "This product is intended to be used as an aid for smoking cessation."

There are two methods to produce nicotine-free tobacco cigarettes. One is to extract nicotine from conventional tobacco plants using steam, a solvent or supercritical fluid extraction processes. These methods also remove other tobacco constituents that are important to a cigarette's taste characteristics. Extracting nicotine also raises handling, storage and disposal issues. An alternative is genetically engineering tobacco to attenuate nicotine biosynthesis.<sup>10</sup> This process specifically prevents the formation of nicotine in the roots of the plants, and the tobacco leaf is not otherwise affected.

In 1999, 22nd Century licensed to Vector Tobacco Ltd. ("Vector") the nicotine-reduction technology currently used in Vector's QUEST(TM) cigarette brand.<sup>10</sup> 22nd Century has improved upon the reduced-nicotine tobacco currently in QUEST(TM). First, 22nd Century has developed nicotine-free flue-cured tobacco plants. Vector's nicotine-free version of QUEST(TM), QUEST 3(TM), contains 100 percent burley tobacco, while American brands

generally contain at least two-thirds flue-cured tobacco, and many international brands only contain flue-cured tobacco. Secondly, 22nd Century believes that it has reduced nicotine levels in its flue-cured varieties significantly below the nicotine levels of the tobacco currently in QUEST 3(TM). 22nd Century plans to make this innovative tobacco available for the production of nicotine-free cigarettes that could be utilized for smoking cessation upon FDA approval.

22nd Century welcomes dialogue with Congress, the FDA, the public and the tobacco industry. The company believes that it is vital for all of these groups to closely work together and openly debate these complex issues to develop science-based solutions.

#### About 22nd Century, LLC

22nd Century, founded in 1999, is a plant biotechnology company focused on the development of relevant and differentiated products produced from genetically-engineered (GE) *Nicotiana* plants. The company develops innovative plant lines with combinations of new and/or enhanced traits. 22nd Century's two main business areas for its GE leaf are (1) potential reduced-risk tobacco products and (2) novel biomass crops for sources of biofuels, including ethanol, and other products. The company has developed nicotine-free tobacco that may be used as an aid to smoking cessation and nicotine-enriched tobacco to be used in very low-yield cigarettes for evaluation in human exposure studies. The company believes, and the scientific literature supports, that these two types of cigarettes, although diametrical, may reduce risk in two distinct groups of smokers.

For the history of denicotinized and nicotine-free cigarettes in the U.S., market share of top brands, and suggestions on nicotine-free cigarette brand extensions, please see:  
[www.xxiiicentury.com/downloads/22nd\\_history.pdf](http://www.xxiiicentury.com/downloads/22nd_history.pdf).

Company Website: [www.xxiiicentury.com](http://www.xxiiicentury.com)

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