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CONTACT: Howard Rose
President & Creative Director
206.361.6400
hrose@firsthand.com

or
Sarah Jackson
Marketing & Communications Specialist
206.361.6400
sarah@firsthand.com
www.firsthand.com

ATTACK OF THE *S. MUTANS!* - 3D GAME TO IMPROVE ORAL HEALTH DEBUTS AT PACIFIC SCIENCE CENTER

Seattle, WA – *Attack of the S. mutans!* is the new 3D interactive game that takes players inside a virtual human mouth to fight tooth decay, debuting at the Pacific Science Center April 29 to May 31, 2010. Created by Firsthand Technology and the University of Washington School of Dentistry with funding by the National Institutes of Health, the interactive exhibit aims to advance oral health while assessing how the use of games can change human behavior.

The State of Oral Health

Even though nearly all Americans understand that they need to brush their teeth daily, many do not. *Attack of the S. mutans!* tackles this issue through a 3D game, traveling exhibit and public health campaign. Says Dr. Peter Milgrom, DDS, a Professor in the Department of Dental Public Health Sciences, Adjunct Professor of Health Services at the University of Washington, and Director of the Northwest/Alaska Center to Reduce Oral Health Disparities: "Many in the U.S. are facing an oral health crisis. Americans have changed their eating habits from three square meals a day to all-day snacking, consuming an annual average of 156 pounds of sugar per person. In 2004, there was a 28 percent increase in tooth decay compared to the previous decade ¹ — much of it in children going untreated."

About the Game and Exhibit

Attack of the S. mutans! is a 2,000-square-foot traveling exhibit and the centerpiece multi-player, stereoscopic 3D game. Mini-theaters in the exhibit allow five players to play on a 10-foot-wide screen wearing 3D polarized

glasses and using hand-held controllers. Highlighting the interaction between acid-producing bacteria, enamel and remineralization with fluoride, this multi-level game delivers increasing challenge and complexity. Visitors join host Dentisha – an inventive adventurer with a fascination for science – on a journey into her own mouth to discover the battle that rages on her teeth.

What are S. mutans?

One drop of saliva holds more than a million bacteria. The worst for teeth are the acid-producing streptococcus mutans (*S. mutans*). Scientists are still unraveling the mysteries of how tiny individual bacteria join forces to form a complex biofilm, commonly known as “plaque,” that locks onto teeth and grows rapidly. *S. mutans* are one of the most virulent of these bacteria, turning the sugar and carbohydrates in mouths into lactic acid, slowly rotting teeth.

Can a Game Affect Behavior?

With 83 percent of young Americans having video game consoles at home, electronic gaming is clearly a powerful platform to spread a public health message. *Attack of the S. mutans!* is designed to offer a positive learning experience that also satisfies this audience’s sophisticated tastes and high expectations in electronic gaming. “Computer games help change the learning dynamic from passive to active learning in ways which children find welcome and familiar,” says Firsthand CEO Ari Hollander.

While at the Pacific Science Center, *Attack of the S. mutans!* will serve as the basis for formal research – evaluating the effectiveness of games as behavior-changing vehicles for children. If successful, the model has the potential to drastically transform educational and public health programming.

Howard Rose, President and Creative Director of Firsthand Technology, says, “The vehicle of a high-quality 3D game enables us to engage kids with science and an important health message through the medium of play. Our approach is to help the public take a fresh look at *why* self-care is important. The game and exhibit draw them into an adventure fighting bacteria and defending enamel. The big-screen stereo 3D adds to the fun of the experience, but we also know it’s an asset in building memories that last. Our goal is to have kids visualize wiping out our oozing plaque biofilms the next time they brush their teeth. On the larger scale, we look forward to

applying the results of this research in oral health to advance other types of important health campaigns.”

Attack of the S. mutans! will be delivered to science centers, hospitals, oral health programs and communities around the nation. Presented in both English and Spanish, the exhibit and game have been designed to be effective in both the formal museum context as well as in mobile units that can easily reach underserved populations. Another long-range goal is to develop a home version of the game.

About Firsthand Technology, Inc.

Based in Seattle, Firsthand Technology Inc. designs and develops virtual reality, real-time 3D and serious games for therapy, research, education, and business. Founded in 1995 to take the best Virtual Reality (VR) technology practices out of the lab and into the real world, recent Firsthand projects include VR therapy for Iraq War veterans with PTSD, pain control systems for burn patients, and a training simulator for administering oral injections. Visit www.firsthand.com for more information.

Grant Number and Title

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1. U.S. health surveillance 1999–2004 has documented a decrease in national oral health compared to the previous decade, with tooth decay increasing 28%. Approximately 40% of all school absences can be attributed to dental problems, equal to 52 million hours annually.

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