NEWS RELEASE

Contact:

Ginny Orndorff
President and CEO
Evolutionary Genomics, LLC
12635 E. Montview Blvd., #211
Aurora, CO 80010
(720) 859-4075
gorndorff@evolgen.com

EVOLUTIONARY GENOMICS IDENTIFIES ADAPTED CHIMPANZEE GENES – LIKELY PLAY IMPORTANT ROLE IN COMBATING AIDS

Aurora, Colo. (December 1, 2004) – Researchers at Evolutionary Genomics have identified several adapted chimpanzee genes that may play an important role in combating AIDS. The researchers believe their findings will open a new avenue to developing more effective drugs to treat human AIDS patients. The article is published in the February 7, 2005 issue of the *Journal of Theoretical Biology* (vol. **232**, issue 3).

The biggest barrier to the development of effective, cheap AIDS drugs is the extreme mutability of HIV (human immunodeficiency virus – the cause of AIDS). Because HIV quickly mutates to become resistant to any one drug, current AIDS treatment involves multiple drug "cocktails", which are very expensive and require demanding treatment schedules. A different approach entirely is to develop drugs that target the more stable proteins of the patient instead of the constantly mutating proteins of the virus.

It is known that HIV originated in chimpanzees, our closest living relatives. When HIV first entered chimpanzee populations, susceptible chimpanzees were killed, while the small minority of resistant chimpanzees survived. The virus has remained in chimpanzee populations, selecting for chimpanzee adaptations that today provide an ironclad means of holding the virus at bay in nature, in spite of the astonishing ability of the virus to mutate. While humans succumb to progressive disease after infection with HIV-1 (AIDS), chimpanzees do not. Thus, Evolutionary Genomics studies adapted chimpanzee proteins looking for new targets for human AIDS drugs.

Evolutionary Genomics scientists discovered that three ICAM (intercellular cell adhesion molecule) proteins, called ICAM 1, ICAM 2, and ICAM 3, have all undergone intensive adaptive evolution in chimpanzees. Genes that have undergone such adaptive evolution are rare; in fact, more than 99% of mammalian genes that have been studied by others do **not** display evidence of adaptive evolution. Thus, these three genes are distinctly different. Yet, as in humans, the ICAM 1, 2, and 3 proteins carry out other important cell to cell contact functions in chimpanzees, so they cannot be too dramatically altered, or these other functions would be negatively affected. For example, EG scientists have found that the changes in the chimpanzee version of ICAM 1 appear in locations where they likely modulate rather than abolish the functions of ICAM 1.

*** * * M O R E * * ***

Cell to cell contact is critical to the progression of infection by HIV-1. HIV-1 appears to co-opt the functions of cell adhesion molecules, particularly ICAMs, to enhance viral infection and transmission. The ICAM proteins are also selectively incorporated by HIV into its virus coat as it commandeers human cell capacities and redirects them to producing more virus. By incorporating the ICAM proteins into its virus coat, HIV-1 becomes more infectious, perhaps even to cells in the body that normally keep the virus out. The adaptive changes in chimpanzee ICAMs thus may slow cell to cell transfer of HIV and/or thwart the increased infectivity of HIV "decorated" with chimpanzee ICAMs.

Dr. Walter Messier, Chief Technology Officer of Evolutionary Genomics and senior author of the study said, "Once we know the specific effects of chimpanzee adaptive changes, we can screen for small molecule compounds that provide infected humans the same disease protection as seen in the chimpanzee".

About Evolutionary Genomics

Evolutionary Genomics is a biotechnology company located in Colorado. The company's "Adapted Traits Platform" is a patented method of comparing genes of closely related species and identifying those responsible for adaptations based on rare evolutionary sequence patterns. Evolutionary Genomics applies the method in both human healthcare and agriculture. To tackle intractable human diseases for which there are clear-cut solutions in chimpanzees or other closely related non-human primates, such as AIDS, hepatitis C, hormone-sensitive cancers, and sepsis, we compare equivalent genes of humans and disease-resistant primates (The company does not work with living chimpanzees or other animals, only with genetic materials provided to the company by zoos and other facilities). To discover natural control points for yield in key agricultural crops we compare equivalent genes of domesticated crops and their wild ancestors.

Contact: **Ginny Orndorff**
President & CEO
(720) 859-4075