



## A TALE OF TWO MAO GENES:

### Exploring the Biology and Culture of Aggression and Anxiety

This science education project grows out of a unique collaboration between Jean Chen Shih, professor of molecular biology in the USC schools of pharmacy and medicine, and Marsha Kinder, professor of critical studies in the USC school of cinema-television and director of The Labyrinth Project, a research initiative on interactive narrative that has produced award-winning installations, DVD-ROMs and websites. Each was named a University Professor for her innovative interdisciplinary research, the only two women at the University of Southern California to receive this honor.

This interactive project focuses on Dr. Shih's thirty years of pioneering molecular research on a crucial pair of brain enzymes, known as the MAO A and MAO B genes (monoamine oxidase) that help control aggression and anxiety in mice and men. Her work has provided the first tangible evidence for a biological basis of aggressive behavior. Besides addressing the latest advances in molecular biology and in the human genome project, this multimedia presentation also treats the interplay between biology and culture and ethical questions in science (concerning stem cell research and cloning, the use of laboratory animals, and unequal access to drugs and treatment). By documenting the exciting discoveries of Dr. Shih and her colleagues and by presenting interviews with several scientists explaining how they became interested in biology and describing what they have achieved, this project also encourages youngsters to choose science as a career.

This information is presented through a transmedia network that includes three interrelated components: an immersive installation in a museum or public venue that reaches the general public; a DVD-ROM, with teachers guide, that can be used in classrooms, conferences, and at home; and a dynamic on-line archive that can be updated and that is accessible worldwide. These three networked multimedia presentations together form an upgradeable system of interactive information delivery, which can appeal to a wide range of users with very different levels of knowledge, from school children and the general public to graduate students and scientists.

All three components will be bilingual (in English and Mandarin) so that this transmedia network can be used both in the United States and in China. Given that Jean Chen Shih was born in China and raised in Taiwan, she has been committed to fostering an exchange of knowledge between the East and the West, particularly in the areas of science and education. Marsha Kinder is also interested in this kind of cross-cultural exchange. She was recently instrumental in establishing an educational exchange program between the USC School of Cinema-Television and the Communication University of China in Beijing, and has just been appointed the foreign Ph.D. advisor for doctoral work in media studies at CUC.

Working with a small team of talented animation, production and critical studies students from the USC School of Cinematic Arts and graduate assistants from Jean Shih's lab, the co-directors on the MAO project, Rosemary Comella and Kristy H.A.

Kang have designed a dynamic interface that provides easy access to an amazing range of information through compelling visual presentation. In the sections that focus on basic molecular biology (e.g., what is MAO, serotonin and other transmitters, gene regulation), users can zoom in from the brain or body into detailed animated illustrations of protein folding and the blocking of neurotransmitters, or they can watch live action movies of lab scientists sequencing genes and performing other challenging tasks. Not only are these images accompanied by informative voice-overs, but a glossary is always available to define unfamiliar words. In the sections that address human behavior (e.g., the human significance of MAO, biology and culture, ethics in science), users have access to a wide range of original interviews with experts from many different fields: the clinical geneticist who studied a Dutch family with several generations of aggressive males with a deficiency in the MAO A gene; a psychologist heading a large study of twins; the dean of USC's medical school who just received a large grant to do stem cell research; a professor of religion addressing the ethics of biogenetics and intelligent design; a media scholar discussing the representation of violence and its impact on culture. In the sections that focus on Jean Shih and other scientists, users can watch interviews to learn about their backgrounds, most important discoveries and visions of the future; or they can watch action footage of the "knockout mice"—the fighting mutants and those more docile. Since it would probably take six hours to see all of this material, users can follow their own curiosity and watch only what interests them (or what their teacher assigns).