

Genetic variance makes difference in clones

Identical genes do not imply identical appearance, clone project leader says

By Katie Hilber
THE BATTALION

With the cloning of a tiny kitten named Copy Cat, Texas A&M made history by becoming the world's first institution of higher learning to successfully clone four different species of animals. Having cloned cattle, goats and pigs, A&M scientists turned their attention to cloning a domestic animal; the end result was a short hair cat named Cc, short for "Copy Cat."

The cloning project, "Operation Copy Cat," was part of the multi-million dollar Missyplicity Project funded by Genetic Savings and Clone.

Cloning occurs when genetic material from a donor cell is removed and inserted into an unfertilized egg, according to Genetic Savings and Clone's Web site. An egg is placed in a surrogate mother and allowed to develop normally, and the baby is an exact genetic copy of the original cell donor at birth.

In Cc's case, the cell used was donated by Rainbow, an adult female short hair cat. The DNA from Rainbow's cell was removed and placed in an unfertilized egg from another donor cat, Allie. The egg, complete with its new DNA, was reinserted into Allie, who would serve as a surrogate mother for the recently-cloned kitten.

After her birth on Dec. 22, 2001, test results proved that Cc has the same genetic makeup as

her donor Rainbow.

While she and Rainbow look very similar, their coat patterns are different. Rainbow is a calico cat with brown, tan and gold patches on her white coat, according to a January issue of Newsday. Cc's white coat has gray stripes.

"Color coat patterns are not completely controlled by genetics; they are also controlled by environmental and non-genetic factors," said Dr. Mark Westhusin, associate professor of veterinary medicine and lead scientist on Operation Copy Cat.

Citing black and white cows as an example, Westhusin said, "Any multi-color animal clone doesn't look exactly the same as the donor."

Popular Science discussed a paper written by Marjorie Oleksiak, Douglas Crawford, and Gary Churchill entitled, "Variation in Genetic Expression Within and Among Natural Populations" that presents information with special significance to the difference between Cc's coat pattern and that of her genetic donor's.

Individual characteristics are determined by genes and the proteins they contain. Not all genes produce the exact same kinds of proteins; if this were the case, every single person would look — and essentially be — exactly the same.

The paper proposes that genes not only make different proteins, but the genes make them in different amounts.

Genes are controlled by small particles of DNA called promoters, which are adjacent to the gene under their control, according to Popular Science. Sometimes, however, the promoter will be located far away from its gene. In this case, the promoter acts as part of a group referred to by scientists as genetic elements. Due to the fact that they are quite a distance from the gene, promoters can become separated from the gene and scattered during the reproductive process. The mixing and matching of genes and genetic elements largely determines characteristics.

The amount of proteins in the genes, besides the types of proteins themselves, might be one reason why Cc is not a mirror image of Rainbow, Westhusin said.

Although Cc is genetically identical to her cell donor, the genetic elements arranged themselves differently in the kitten and were therefore expressed as a different coat pattern, he said.

A&M scientists are continually working to expand their knowledge of cloning. "We've really refocused our efforts on basic science," Westhusin said. "We're trying to understand why cloning is so inefficient."

Citing high abortion rates early in gestation and abnormal developments as two of the problems with cloning, Westhusin said A&M scientists are interested in closely studying the communication between the placenta and the mother.



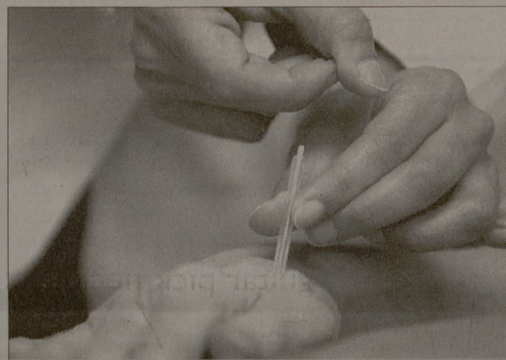
- Most clones are born healthy
- Clones have a higher than average risk of dying in the womb or shortly after birth
- Abnormalities include deformed hearts, lungs and blood vessels

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SOURCE: THE WASHINGTON POST

Modern healers embracing ancient acupuncture techniques

By Nick Perry
KRT CAMPUS



KRT CAMPUS

Jasmine Patel performs an acupuncture procedure on Barbara Hubbard at the Bastyr Center in Wallingford, Washington.

medicine education. It would not be considered a medical degree or give graduates the same privileges as medical doctors, such as the ability to prescribe drugs. It would be up to each state to decide whether to allow graduates to put "Dr."

before their names.

Jasmine Patel, 27, of Kenmore plans to apply for the new course. She is completing a residency at Bastyr's acupuncture and herbal clinic in Wallingford, Wash.

Patel said the new degree will give her more training and the ability to explore the academic and teaching aspects of her field. She said she prefers the natural approach of acupuncture and herbal medicine to what she sees as traditional medicine's focus on symptoms.

"It's a more holistic-based therapy and more healing," she said. "It gets to the root of the problem."

Acupuncture remains most well-known for its help with pain relief, especially for sports injuries. Courtney said it can treat a host of other internal medical conditions and that federally funded drug-rehabilitation programs throughout the country use acupuncture to help reduce cravings among recovering drug addicts.

Acupuncture still is shunned in some areas, particularly the Midwest.

Nine states do not recognize acupuncture, making practitioners more vulnerable to lawsuits. An additional 11 states require physician oversight or referral. The remaining 30 states recognize acupuncture as a legitimate, independent profession.

A typical acupuncture treatment involves a practitioner inserting up to a dozen needles about one-quarter of an inch below the skin surface for about 30 minutes. Treatments are repeated once or twice a week for up to six weeks.

"We are still not really sure how it works," Courtney said. "It opens channels and gets things moving. It works where there is an imbalance of energy pathways."

In China, patients have sworn by acupuncture for 2,500 years. The treatment has gained popularity in the U.S. since the 1960s and got a big boost six years ago when the Food and Drug Administration removed certain restrictions, allowing patients to claim health-insurance reimbursements.

SEATTLE — Students have long studied for doctoral degrees in philosophy and medicine — but never before for a doctorate in acupuncture. No recognized learning institution in the United States has ever offered such a course. But this year, Bastyr University in Kenmore, Wash., plans to offer a "DAOM" — a Doctorate in Acupuncture and Oriental Medicine. An alternative college in Portland, Ore., has similar plans. The new degree will give more credibility to a treatment that is increasingly accepted and embraced as a companion to conventional medicine, said Terry Courtney, the program chairman. It also will open research opportunities and the chance for students to specialize within their field. The program is expected to get accreditation from a national board that oversees Oriental-

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Anxiety Group
Wednesdays 3:30-5:00 p.m.

An interpersonal group for students who suffer from general or social anxieties. Students will work on the impact of anxieties in their lives, as well as explore the interpersonal meanings of anxiety symptoms.
Facilitators: Carlos Orozco & Peter Barnes

Bipolar Support Group
Tuesdays 3:30-4:30 p.m.

Provides support and information to students diagnosed with a bipolar disorder. Group meets weekly and is led by a psychiatrist. Potential topics include diagnosis, symptoms, medications, and lifestyle issues/relapse prevention.
Facilitator: Nancy Stebbins

Interpersonal Counseling Group
Tuesdays 5:00-6:30 p.m. Wednesdays 1:00-2:30 p.m.

This psychotherapy group is for students desiring to live more authentically with themselves and relate more genuinely with others. Explore self-limiting life patterns and share with others through honest self disclosure in a safe, supportive atmosphere.
Facilitators: Ron Lutz & Peter Barnes (Tues.)
Ron Lutz & David Sandrow (Wed.)

Biofeedback Workshop
Thursdays 3:40-5:40 p.m.

One-session workshops that give an introduction to relaxation techniques, including how biofeedback aids in relaxation. Individual follow-up consultation is available.
Facilitator: Steve Wilson

Grief and Loss Group
Wednesdays 1:30-3:00 p.m.

Have you experienced the death of a loved one or friend? Has your loss affected your concentration or studying? Would you like to share with others who have been through this experience? Come to this supportive group to share with others and to understand the grief recovery process.
Facilitators: Nancy Welch & Robert Carter

Academic SURVIVOR Series
Tuesdays 11:30-1:00 p.m.

Need some help surviving the academic transition from high school to college? Before "tribal council votes you off," attend this Tuesday series beginning March 17th and ending April 29th. Screening before Oct. 7th required for participation.
Facilitator: Patti Collins

Thesis/Dissertation Support Group
Wednesdays 5:00-6:30 p.m.

This group is for graduate students struggling with the process of writing a thesis or dissertation. Group topics include issues of competence, procrastination, anxiety, goal-setting, and bureaucratic struggles.
Facilitator: Brian Williams

Academics Anonymous
Wednesdays 2:20-3:35 p.m.

Motivated to improve your academic performance but find it difficult to be consistent in your efforts? Join this 9 week support group on Wednesdays from 4-5:30pm beginning February 19th and ending April 23rd. Learn effective study strategies, and get support from others. Topics may include procrastination and building academic confidence. Screening before Sept. 16th is required for participation.
Facilitator: Patti Collins

Career Exploration Group
Thursdays 4:00-5:30 p.m.

This is a 5 week group beginning on March 20th. Designed to teach participants how to make decisions. Groups will identify interests, skills, work values and personality characteristics, research the job market and occupation. An initial appointment with a career counselor is required.
Facilitator: Carla Hilland

Texas A&M University has a strong institutional commitment to the principle of diversity in all areas. In that spirit, admission to Texas A&M University and any of its sponsored programs is open to all qualified individuals without regard to any subgroup classification or stereotype.