

# Armstrong is no Superman

BY SCOTT DEVEAU

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GLOBE AND MAIL UPDATE

Lance Armstrong is not superman.

The six-time Tour-de-France champion is not a genetic freak and if he didn't train the way he does, a high school cyclist could compete against him, according to the author of a new study published in the June issue of the Journal of Applied Physiology.

The American cycling phenom will compete in his final Tour de France this July. Not a moment too soon, because the study claims to have discovered the secret to Mr. Armstrong's success.

"There are many stories and myths about Armstrong," Edward Coyle, a professor at the University of Texas at Austin, said. "Some people have the opinion that Lance is superhuman - that he does not fatigue. I can assure you he's just as human as anybody else."

Mr. Coyle's study, which tracked the cycling champion from the age of 21, when he was just turning professional, to the age of 28, with his first Tour de France victory, included his cancer diagnosis, surgery, chemotherapy and recovery.

"Our main goal was to study someone over a long period of time," Mr. Coyle said, adding prior to this study there were no reliable, or believable, explanations for what allows someone like Mr. Armstrong to improve from a competitor, to a national champion, to a world-class competitor over the course of a number of years.

When it comes to Mr. Armstrong's apparent superhuman strength, there were many myths to bust and Mr. Coyle, who studied the cyclist from 1992 to 1999, believes the data he collected bursts them all.

Mr. Armstrong's exceptional career, Mr. Coyle said, is more a testament to hard work and determination than anything else.

Mr. Coyle said his data disproves the myth that Mr. Armstrong's body changed after his battle with cancer. The theory, which Mr. Coyle said is purely speculative, was that Mr. Armstrong's chemotherapy shaved some size off his upper-body, improving his performance.

According to the Mr. Coyle's study, just eight-month after his chemotherapy treatment, Mr. Armstrong's proportions returned to what would be expected from a highly trained athlete during a period of detraining.

The other myth busted by the data, Mr. Coyle said, is that the Mr. Armstrong is genetically predisposed to the sport.

"Is he a genetic freak? Although I've not yet been able to determine what that means, he doesn't have a third cycling leg or something like that," Mr. Coyle said.

Mr. Coyle, who heads the Direct Human Performance Laboratory at Texas, studied two other cyclists with the same proportions and physiological potential, and were competing at the same level as Mr. Armstrong at one point.

"I asked Lance once why they weren't as good as him. It was because they didn't have the motivation and the willpower to compete," Mr. Coyle said. "If Lance didn't train the way he does, if he was just an average fit kind of guy, a high school cyclist could compete with him."

There is however a training model that has been developed from the data, which isolates what differentiates Mr. Armstrong's performance from that of his competitors during the 21 phases of the Tour de France. The secret is a combination of long-term training and a planned weight loss just prior to the race.

Riding for up to eight hours a day over the course of seven years, when combined with a planned 7 per cent reduction of body mass and fat prior to the Tour de France, led Mr. Armstrong to 18 per cent increase in power per kilogram output, and an 8 per cent increase in muscle efficiency.

"One per cent [muscle efficiency] separates first place from last place. Eight per cent is a phenomenal improvement," Mr. Coyle said.

While the study did not specifically test for performance enhancing drugs, Mr. Coyle said neither muscle efficiency nor power per kilogram output would be effected but such drugs.

However, Mr. Armstrong's reduction in body mass is specific to his Tour de France success.

It is widely known that Mr. Armstrong is one the best climbers in the world. He normally takes his lead in the hills of the race. Being lighter, combined with a very high muscle efficiency, helps Mr. Armstrong muscle up the hills faster than his competitors, Mr. Coyle said.

The training model is now being used by other cyclists, he added, but it remains to be seen if any of them will be able to achieve the world class status of Mr. Armstrong by following it.

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**FURTHER QUALIFICATION ON THE QUOTE BY DR. COYLE:**

"If Lance didn't train the way he does, if he was just an average fit kind of guy, a high school cyclist could compete with him."

This statement could be improved with the qualifiers added in (parenteses).

"If Lance didn't (EVER IN HIS LIFE) train the way he does, if he was just an average fit kind of guy (WHO ONLY EXERCISED FOR EASY RECREATION), a high school cyclist (WHO TRAINS SERIOUSLY) could compete with him."

Physiologically, both the never trained Lance and the well trained high School competitor would have a VO<sub>2</sub>max of 60-65 ml/kg/min and a LT at about 70%. When racing, they both might cycle 22-24 miles in one-hour.