

## RESEARCH INSTITUTES: SSISA, UNIVERSITY OF CAPE TOWN

There is a growing tradition of footwear and clothing manufacturers working with scientific and technical institutes to help them create better products for active sportswear and protective wear. One such organisation that really understands the medical and physiological demands is found in Cape Town.



# *If you swim at the North Pole...*

**I**f you swim at the North Pole, take your own sports doctor with you. In July 2007, Lewis Gordon Pugh swam a kilometre in just under 19 minutes in the freezing waters of the Geographic North Pole, wearing just Speedo shorts, a cap and goggles. In Norway, in 2006, he had broken his own world record for the longest ice water swim. In December 2005, he had undertaken a record breaking swim near the South Pole, taking 18 minutes and 10 seconds to swim a kilometre. Pugh, who started long distance swimming in 1987 when he swam from Robben Island to Cape Town, is

described as an adventurer from that city. It is no coincidence that his mentor and the leader of his team of sports scientists is a doctor, Professor Tim Noakes, of the Sports Science Institute of South Africa.

Of Lewis Pugh, Dr Noakes states: "Lewis is able to survive in these waters due to a combination of factors. When he enters the water, his core body temperature is extremely high (38.4°C) and he is able to maintain this temperature for up to 15 minutes in ice cold water. To my knowledge, this capacity has not been previously described. But most importantly he has an iron will and is

*The main campus of the university with Devil's Peak in the background.*

*Adrian Frith/Wikipedia*



genetically suited to handling extreme cold." As we will see, body temperature is a key factor in maximising sport performance according to Noakes. And it was he who has been able to convince Pugh that his body will survive these extreme swims.

### Working in a sports mad country

Cape Town may seem a long way distant from the established homes of sporting endeavour but nothing could be further from the truth. Besides being considered the most beautiful place on any yachtsman's route around the world – Sir Francis Drake, the Elizabethan sailor, who circumnavigated the globe in 1577-1580, described its setting as 'the fairest cape in all the world' – it is a fact that it is home to one of the world's leading institutes of sports science.

In a way, that, too, is not surprising as South Africa is a 'sports mad' country. The nation has won the World Cup in rugby football (twice), is a leading cricketing nation, and is currently getting ready to host the World Cup in football (soccer) in 2010. It is a surfer's paradise (the Red Bull Big Wave Africa is held every August just a few miles away from the institute) and has some of the world's most stunning golf courses. Cape Town also provides the spectacular scenery for the world's largest individually timed cycle race.

The Sports Science Institute of South Africa is based in Newlands, nestling between the famous rugby stadium and its equally famous cricket ground. (Its other next door neighbour is SAB Miller, one of the world's largest brewing companies, which sponsors many of South Africa's national teams.) The institute, however, is linked to the University of Cape Town, a couple of kilometres away, with Noakes as its director of its medical research unit for exercise science and sports medicine.

### More than a doctor

Noakes qualified as a doctor at the university and was inspired by Professor Christiaan Barnard, another alumnus who rose to international fame when he performed the world's first heart transplant in 1967. Noakes received his MD for his thesis "Exercise and the Heart" in 1981.

He is a firm believer in real science and his current research focus is to develop a novel neurobiological model of integrated human function during exercise and to use this model to optimise human exercise performance, the treatment and prevention of sports injuries, as well as the treatment and prevention of chronic diseases. It is research at this level that could be of interest to textile companies, as it may lead to fresh opportunities. This research



has already led to more than 400 papers in many leading scientific publications. What is also worth noting is that Noakes is the author of *Lore of Running*, now in its 4th edition and considered the definitive work on how humans run, as well as co-author of *Running Injuries*, *Lore of Cycling*, *Rugby Without Risk* and the *Art and Science of Cricket*.

### Understanding the sport

Noakes is no ordinary academic. Besides being a champion rower, he has raced in more than 70 marathons and ultra-marathons and has completed the Argus 105km cycle race on eight occasions (with approximately 40,000 cyclists taking part, it is the world's largest individually timed cycle race, and is the first event outside Europe to be included in the International Cycling Union's Golden Bike Series).

Visiting his office, one is immediately surrounded with reminders of his sporting career and his involvement in motivating sportsmen. Displayed behind glass is a collection of running shoes, many of which were his own, and many making claims which

*An opportunity to study sport in action: the Institute has the two internationally famous Newlands rugby and cricket stadiums as immediate neighbours.*

WTP

he feels are not necessarily accurate in terms of the way the body works. "There's a lot of bad science out there," he states.

Noakes has been watching the claims made by some of the biggest names in sports footwear, especially manufacturers of trainers. He has proof that many of the claims are based on what he would call 'bad science', statements which sound plausible to consumers but that do not stand the scrutiny of real scientific trials. Among the samples he has on display are some that have actively contributed to foot and ankle injuries, while their manufacturers have claimed



*Professor Tim Noakes, of the Sports Science Institute of South Africa.*

 SSISA

so-called benefits. It is interesting to note that, though the shoes may have been launched with promotional fanfare, they have quietly disappeared from company ranges.

### **Keeping cool, watch what you drink**

Discussion turned to what he would like to see developed by the textile industry for athletes and active sports people in general. "Keeping the body temperature low is a positive physiological benefit," states Noakes, who, among many accolades, has also received the highest honour in South Africa for services to the country's sport and science, the Presidential Award—Order of Mapungubwe Silver, "and it would be great if someone could develop a textile structure which would reduce body temperature by just 1°F while the person is involved in strenuous activity. Keeping the body comfortable and dry, with clothing providing good evaporative capability, is fine but it does not necessarily mean the body can perform at peak level."

Hydration is another of his personal bugbears and his views may not be popular in some quarters. "Basically we showed in 1985, proven in 1991, that overdrinking can cause death in marathon and ultramarathon runners. Despite this, the industry continued to promote overdrinking until finally, in 2002, a lady died from overdrinking a sports drink in the Boston Marathon. Only after that did people start to take notice of what we were saying. There have been two deaths from this condition in the London Marathon since 2005. So the condition continues to exist. Athletes need to be told to drink to quench thirst only — that is all they need to remember." His research won him the 2001 International Cannes Grand Prix Award for research into Medicine and Water.

Professor Noakes obviously has a great love for sport and helping people derive the maximum physical benefits from their endeavours. The enthusiasm he generates can be felt throughout the sports science institute. When it comes to motivating people, he is the right person to have on your team, an extra reserve—the name that doesn't appear on the team sheet but should. 🌐