Discussion Summary

Dr. Friedmann began by stating the purpose and history of the World Anti-Doping Association (WADA), of which he is a member. The International Olympic Committee (IOC) created WADA four years ago, just after the Sydney Olympics, when the committee became concerned about the possible use of genetic doping or enhancement among athletes. WADA is now responsible for monitoring and screening athletes for drug use.

The purpose of Dr. Friedmann’s talk was to show that genetic enhancement is a very real possibility for the near future, and to argue that problems with it will be seen first among athletes. WADA thinks that athletes are the most likely customers for early gene-based enhancement techniques: they are risk-takers, who already commonly use enhancement drugs, and are under a lot of financial, social and psychological pressure to win at all costs. However, Dr. Friedmann stressed that ‘enhancement’ is not limited to athletics, but can extend to any genetically determined characteristic. As the genetic basis for behavior becomes increasingly clear, it will become as easy to manipulate as genes for height and muscle.

Some of the chief ethical issues Dr. Friedmann identified with genetic enhancement are whether it can or should be used to treat and prevent disease; whether it can or should be used to affect non-disease traits, and which ones; and whether it can or should be used on germline cells, which would pass the modifications on to a person’s descendents. Additional ethical problems appear for athletes. Most people think that pharmacological and genetic aids to enhancement are cheating. These people — who include the IOC, WADA, Leon Kass of the Presidents Council on Bioethics, and probably society in general — say that sports are driven and defined by following rules. Others, like Dr. Fost, say that there is no problem; steroids have not been specifically shown to be dangerous, and issues of inequality can’t be proven.

Though some think genetic doping is far in the future, gene therapy has now been shown to be possible. In the April 18, 2002 New England Journal of Medicine, a French group unequivocally showed that immuno-deficient children can be treated by introducing genes into their blood cells. The scientists introduced viruses with functional copies of the critical gene into the children’s blood cells, which were then reintroduced into the children. These blood cells went to the bone marrow and reproduced into complete, functioning immune systems. Unfortunately, out of the 15-16 patients treated in France, three have developed life-threatening leukemia and one has died of it. This is known to be a direct result of the treatment: the virus
seeks to integrate into any point in the genome, and in the children with leukemia, it integrated into and activated an oncogene. As a consequence, the French team stopped their study, but an English team has continued with the procedure and Dr. Friedmann reports that American teams, while they have not begun, are researching the idea. But whatever happens, this study has shown gene therapy to be possible, and made it a real object of research with quantifiable risks.

At this point, Dr. Friedmann paused to mark a distinction between therapy and enhancement. He specified that therapy is an attempt, like the one cited above, to cure or improve an illness. Enhancement, on the other hand, modifies traits or performance from ‘normal’ to ‘better than normal’ or ‘ideal.’ A procedure that is treatment for some — such as enhancing muscle growth and repair in patients with muscular dystrophy — can be used as enhancement for others. However, there are indistinct boundaries between normal and abnormal, or health and disease. So, for example, is losing strength in old age perfectly normal or a state that requires treatment?

Some likely genetic modifications for athletes could be taken from therapies being currently researched: as mentioned above, “Schwarzenegger” mice are being created with superior muscle size and repair ability to help those suffering from muscular dystrophy, and erythropoietin is a hormone discovered to help red blood cell production and oxygenation in people with anemia or kidney disease. Both can be adapted to use in healthy athletes, and are virtually impossible to detect or criminalize. And, while the NIH will not currently consider any studies involving human genetic enhancement, that does not mean that people will not subject themselves to the dangers of non-sanctioned trials. Dr. Friedmann also noted that people are currently interested in making gene therapy reversible, using genes that can be turned ‘off’ and ‘on,’ or removable viruses; these would be even harder to detect.

One concern brought up by both Dr. Friedmann and participants was whether these advances in genetic engineering could lead to a new eugenics, and whether certain genetic traits or disease susceptibilities could be stigmatized or forcibly altered. It was pointed out that the ‘new eugenics’ is being pushed forward individually by consumers, rather than by the state, which some participants felt would make it less of a problem. Others were less sanguine,