For these reasons, it is unlikely that the effects of STACs on human lifespan and healthspan will be assessed directly. Instead, it has been speculated that the first insights into the effects of STACs on human aging and disease prevention will be inferred from longer-term disease-specific trials, many of which are currently ongoing.[15] In addition, it has been estimated that over two thirds of Americans who consume multiple dietary supplements take resveratrol.[115] This large uncontrolled public drug trial could contribute important data in the form of individual medical reports and case studies about how STACs affect human health.

While research into aging and anti-aging drugs was once looked upon with skepticism, there are now clear indications that this perception is changing. For example, in 1974 the US National Institute for Aging (NIA) was founded with the specific directive of funding research focusing on the biological, social, and economic implications of aging (http://www.nia.nih.gov). More recently, the FDA has revised its policies and recommendations regarding clinical trials for lifespan extending therapeutics and given approval for the first anti-aging drug trial. The aim of the Targeting Aging with Metformin (TAME) study is to treat 3000 volunteers aged 70–80 years for 5–7 years with metformin and subsequently observe if age-related disease is delayed.[4] Metformin, an AMPK activator, is currently used for the treatment of type II diabetes and has previously been shown to extend the lifespan of mice.[22] If successful, this study could revolutionize medicine by demonstrating the possibility of treating multiple age-related diseases using a single compound. Moreover, positive results with metformin could help advocate approval for similar studies using STACs.

11.6 Conclusion

Over the past century, developments in medicine relating to vaccination, disinfectants, and antibiotics have led to a dramatic decrease in deaths due to infectious diseases, an increase in lifespan, and an increase in the elderly demographic.[200] In fact, it has been predicted that by the year 2050, 20% of the world's population will be over the age of 60.[200] Unfortunately, this increase in life expectancy is not always coincident with health, as individuals over the age of 65 suffer from 1–3 chronic age-related diseases on average.[200] Therefore, now more than ever, there is a need to develop treatments for aging and age-related disease. STACs are one of several new classes of molecules recently discovered that could potentially be used to treat multiple age-related diseases in humans. Whether STACs fulfill their promise as human anti-aging drugs or not, it is becoming increasingly clear that such compounds do exist, and that the medical and societal impact of the dissemination of these pharmaceuticals will be immense.

References

1. F. B. Johnson, D. A. Sinclair and L. Guarente, *Cell*, 1999, **96**, 291.
2. T. B. Kirkwood, *Nature*, 1977, **270**, 301.
3. P. B. Medawar, *An Unsolved Problem of Biology*, London, H.K. Lewis, 1952.