

Protective caps on chromosomes called, “telomeres.”

Every time a cell divides, these protective caps wear down, and over time, the [telomeres](#) shorten. As the telomeres shorten, the cells start to malfunction and lose their ability to divide. Today, based on Blackburn’s research, scientists use the measure of telomere length as a metric for aging and disease risk.

She also discovered an enzyme called “telomerase,” which protects the chromosomal caps from the wear and tear of cellular division, or aging. Therefore, the more telomerase you have, the longer your telomeres will be; the less telomerase you have, the shorter your telomeres will be. The shorter your telomeres, the more exposed to aging, degeneration and disease you become. (1)

Blackburn set out to find out which factors besides aging caused these telomeres to shorten. Until her research, genes and their genetic expression were thought to be the only factors responsible for telomere length. Blackburn’s theory purporting that one’s environment and psychology could affect telomere length was a very radical idea.

In one of her landmark studies in collaboration with Elissa Epel, Director of the Aging, Metabolism and Emotion Center at UCSF, Blackburn investigated the theory that the more [stressed](#) an individual, the lower the telomerase activity. They divided 58 women into two carefully selected groups of highly stressed women and controls. What they found was astonishing! Women with the highest levels of perceived stress, psychological stress and chronic stress had telomeres shorter on average by the equivalent of *at least one decade of additional aging* compared to low stress women. (2)

Blackburn’s Next Hurdle

Consequently, many more studies were done which supported Blackburn’s theory of stress having a negative impact on the length of the telomeres and therefore accelerated the aging process.

Appropriately, the question arose:

Are shorter telomeres a metric for an increased risk of health problems?

The answer was yes, and more studies ensued. One study determined that elderly men who had telomeres measured to be shorter for a period of two and a half years had three times the risk of dying of cardiovascular issues in the next nine years compared to those men whose telomeres stayed the same length or got longer. (1)

In another study by Dr. Mary Armanios, MD at the John Hopkins School of Medicine, the telomere lengths of over 2,000 Native Americans were evaluated. Those with the shortest telomeres were more than twice as likely to develop diabetes during a five and a half year window. (1)

Can Meditation Stop the Shortening of Telomeres?

Dr. Blackburn followed the logical paper trail: shorter telomeres cause accelerated aging, highly stressed people had shorter telomeres, and short telomeres are linked to health concerns.

It then seemed logical to measure the telomeres *without* the degenerative effects of stress. The paper trail led her to study meditation and the results were impressive.

Less stressed people with longer telomeres had:

- **Improved cognitive ability**
- **Less negative thoughts**
- **Better purpose of life**
- **Improved mindfulness**
- **Improved overall health**
- **Lived longer**

Traditionally, Nobel Prize winners do not study meditation; so kudos to Dr. Blackburn for enduring much professional ridicule and bias, and persevering to follow the path to truth in the name of science. Sadly, it seems too few scientists are willing to do that. (1) Nonetheless, Dr. Blackburn decided to study the effects of meditation on telomere length.

In one small pilot study, a group of 30 volunteers went to [Shambhala](#) Mountain Center in Northern Colorado for a three-month meditation retreat. Impressively, the group had a whopping 30% increase in telomerase activity! (3) In addition, this was the first study to link meditation to telomerase activity, and one in a long list of others that support the psychological health benefits of meditation. It was found that meditation supported improved purpose of life, mindfulness, and less negative emotionality compared to the control group.

In another study conducted at UCLA, a group of thirty-nine dementia caregivers with the average age of 60 participated in a chanting meditation called, *kirtan kriya* for just 12 minutes a day, for eight weeks. They compared this group with another group that listened to relaxing music. The chanting meditation group showed improvement in depressive symptoms, improved mental health and cognitive function compared to the group that listened to relaxing music. The meditation group also showed a 43% increase in telomerase activity compared to the group that listened to relaxing music! (4)

In a Dean Ornish study which incorporated an [Ayurvedic](#) lifestyle of yoga, vegetarian diet, meditation, and breathing exercises on men with low-risk prostate cancer, telomere length was longer and telomerase activity was higher after five years compared to a control group. (5)

In another study, a battery of health tests on the elderly (81+) compared Transcendental Meditation (TM), Mindfulness Training, and simple relaxation (low mindfulness) groups. In paired associate learning, two measures of cognitive flexibility, mental health, systolic blood pressure, ratings of behavioral flexibility, aging, and efficacy of treatment, the Transcendental Meditation group scored the highest followed by the Mindfulness Training group compared to the simple relaxation group that scored the lowest.

After three years, the survival rate was 100% for TM and 87.5% for Mindfulness Training in contrast to lower rates for the other simple relaxation groups, suggesting that meditation was the more effective practice regarding improved physical and mental health. (6)

Conclusion

More studies need to be done on both the benefits of meditation and the environmental and psychological factors that shorten telomeres. Thanks to Dr. Blackburn and her colleagues, we now have studies suggesting that regular meditation practice is beneficial for stress reduction.

Dr. Blackburn believes that if people could see the impact of stress on their telomeres, they would have the motivation to change their lifestyle and be more willing to embrace a yoga or meditation practice.

I created the [Transformational Awareness Technique \(TAT\)](#) for two reasons:

1. I found that while many people had learned to meditate, few stuck with it over time; many told me that they simply weren't able to do it. I wanted to create a meditation practice that was simple and one that everyone could be successful at. I wanted to make sure that everyone who started to meditate felt an immediate difference and that it was compelling enough to motivate them to stick with it.
2. While meditation indisputably reduces stress and has tremendous health benefits, I have observed that it does not always change negative behavioral patterns. For people to stick with a practice, it has to transform lives; it has to give them the awareness, and the motivation to make deep transformational changes.

When my patients finally change old, destructive behavioral patterns through the self-awareness gleaned by meditating *and* by taking transformational action-steps that I guide them through in the TAT, the results have been amazing!

What makes the TAT unique is the combination of heightened self-awareness, *plus* the guidance of how to take transformational action-steps. The combination of the two allows us to play the Game of Life—the winner gets to have the most fun...and undoubtedly, the longest telomeres!