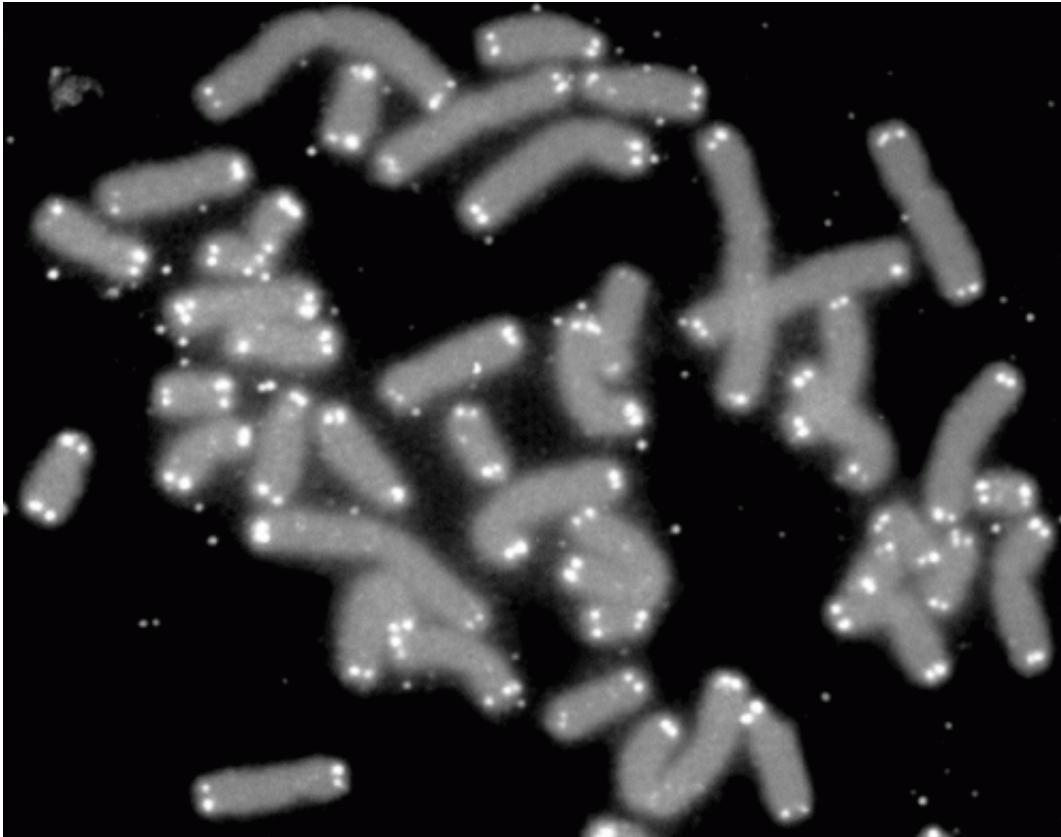


# Telomeres and social disadvantage

April 7 2014

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Human chromosomes (grey) capped by telomeres (white). Credit: PD-NASA; PD-USGOV-NASA

Genes amplify the stress of harsh environments for some children, and magnify the advantage of supportive environments for other children, according to a study that's one of the first to document how genes interacting with social environments affect biomarkers of stress.

"Our findings suggest that an individual's genetic architecture moderates the magnitude of the response to external stimuli—but it is the environment that determines the direction" says Colter Mitchell, lead author of the paper and a researcher at the University of Michigan Institute for Social Research (ISR).

The study, published today in the *Proceedings of the National Academy of Sciences*, uses telomere length as a marker of stress. Found at the ends of chromosomes, telomeres generally shorten with age, and when individuals are exposed to disease and [chronic stress](#), including the stress of living in a disadvantaged environment.

For the study, Mitchell and colleagues used telomere samples from a group of 40 nine-year-old boys from two very different environments – one nurturing and the other harsh. Those in the nurturing environment came from stable families, with nurturing parenting, good maternal mental health, and positive socioeconomic conditions, while those in the [harsh environment](#) experienced high levels of poverty, [harsh parenting](#), poor maternal mental health, and high family instability.

For those children with heightened sensitivity in the serotonergic and dopaminergic genetic pathways compared to other children, [telomere length](#) was shortest in a disadvantaged environment, and longest in a supportive environment.

**More information:** Social disadvantage, genetic sensitivity, and children's telomere length, *PNAS*, [www.pnas.org/cgi/doi/10.1073/pnas.1404293111](http://www.pnas.org/cgi/doi/10.1073/pnas.1404293111)

Provided by University of Michigan

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