

# Researcher studies why offspring of older parents have reduced longevity

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A depiction of the double helical structure of DNA. Its four coding units (A, T, C, G) are color-coded in pink, orange, purple and yellow. Credit: NHGRI

An NDSU faculty member is among a group of international researchers studying why older parents produce offspring who tend to have shorter lives.

Britt J. Heidinger, assistant professor of biological sciences, has joined colleagues in Scotland to address this question through the study of a long-lived seabird, the European shag. The results appear in "Parental age influences [offspring](#) telomere [loss](#)," an article accepted for publication in *Functional Ecology*.

According to Heidinger, research in many organisms has shown that offspring produced by older parents often do not live as long, but little is known about why that occurs.

The answer may lie in the offspring's DNA. Or more precisely, in the length of telomeres, which are protective caps at the ends of chromosomes.

"Telomeres function a bit like the plastic caps at the ends of shoelaces and protect the coding DNA from loss during cell division. Telomere loss reduces the lifespan of cells and is thought to be involved in the aging process," Heidinger explained.

Individuals with longer telomeres or slower rates of telomere loss have been shown to have greater longevity in a wide range of species. There also is evidence the offspring of older parents have [shorter telomeres](#), but it is not clear whether this is due to the offspring inheriting shorter telomeres or if their telomere loss during pre- or post-natal growth is higher.

The researchers examined the relationship between the age of the parents and the telomere length of their offspring. They found that when European shag [chicks](#) first hatched, there was no effect of parental age

on offspring telomere length, suggesting there were no pre-natal effects of parental age. However, chicks produced by older parents had greater telomere loss during nestling growth than chicks produced by younger parents.

The results are consistent with the hypothesis that the age of the parents influences offspring longevity, in part, through its effects on offspring telomere loss during post-natal growth.

"We have previously found that shag chicks that experience higher levels of stress during development have greater telomere loss. These results could have occurred because older parents do not provide as much parental care as younger parents, or because parents that put less effort into raising their chicks live to be older," Heidinger said.

**More information:** Britt J. Heidinger et al. Parental age influences offspring telomere loss, *Functional Ecology* (2015). [DOI: 10.1111/1365-2435.12630](https://doi.org/10.1111/1365-2435.12630)

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