# Dog aging project information (Colgate University)

**Project description:**
Animal life-history traits fall within limited ecological space, a continuum referred to as a "slow-fast" life-history axis. Differences in life-history traits are thought to result from trade-offs between investment in reproduction or self-maintenance as mediated by the biotic and abiotic environment. Dogs seem to be an anomaly to the typical correlations within this life-history trade-offs, with smaller dogs having higher metabolic rates and longer lives compared with larger dogs. Thus, dogs provide a unique system to examine physiological consequences of life-history trade-offs. For example, small dogs tend to have longer lifespans, fewer pups per litter, faster but shorter growth trajectories, higher metabolic rates and, in general, larger metabolically active organs compared with large dogs. The mechanistic and metabolic consequences, at the cellular level, of this seemingly contradictory relationship between body mass and lifespan in this species has not been previously addressed. We will use skin from non-invasive, routine surgeries such as tail-docks and/or dew-claw removal by veterinarians to isolate primary fibroblasts in puppies of different body masses. Additionally, we will also ask veterinarians to collect ear clips, declaws, or any available skin samples from dogs euthanized due to old age. The comparison of, not just different body sizes, but also age differences at the cellular level will be pivotal for this research question. Primary dermal fibroblasts will be used to explore physiological changes at the cellular level that will answer the question "why do smaller breed dogs live longer than larger breed dogs?"

**Procedures:**
Skin will be collected from dogs and placed in media at a the veterinarian's office. After collection, we will grow primary fibroblast cells from the skin removed. These cells will be stored in a cryogenic tank at Colgate until we use them for experiments.

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