The belief that women are born with a finite ovarian reserve has been debated since the discovery of purported oogonial stem cells (OSCs). These cells, described in mice and humans, seemingly have the ability to generate oocytes when cultured under specific conditions, resulting in live offspring in mice. This study aimed to verify independently the existence of OSCs in human ovary and determine whether they could be isolated from bovine tissue.

OSCs were isolated from ovarian cortex using a fluorescence-activated cell sorting (FACS)-based technique, with cells sorted for VASA. The cells were cultured in vitro and RT-PCR performed to analyse expression of germline-specific markers. The cells were transduced to express GFP using a lentivirus. A rare population of mitotically-active VASA-positive cells was isolated from bovine and human tissue and they have grown in vitro for several months. RT-PCR demonstrated consistent expression of several germline markers, including fragilis (IFITM3) and BLIMP1. Cryopreservation of the cells has been possible, with successful reinitiation of growth on thawing. Stable expression of GFP was achieved after lentivirus transduction.

The expression of germline markers indicates these cells have characteristics of germline, or oogonial, stem cells. This is the first report of OSCs being isolated from bovine ovary and corroborates a previous report showing the isolation of human OSCs. These cells provide a novel model for investigating germ cell development and future experiments will involve injection of OSCs into ovarian cortex to assess their capacity to undergo follicle formation and oocyte development in an in vitro environment.