Influenza A virus (IAV) initiates infections by binding to host-cell surface receptors containing sialic acid. Avian-lineage IAVs preferentially bind α-2,3-linked sialic acids while human-lineage IAVs prefer α-2,6-linked sialic acid receptors. Historically, Madin Darby Canine Kidney (MDCK) cells have been used to isolate IAVs from many species because these cells express both α-2,3-linked and α-2,6-linked receptors. Our hypothesis was that cell culture mediums would alter the relative proportions of α-2,3-linked and α-2,6-linked sialic acid receptors on MDCK cells. Cells were cultured in either serum free media (SFM) or medium containing fetal bovine serum (FBS). Cells from each treatment were stained with sialic acid residue specific dyes, which were subsequently detected using flow cytometry. Cells cultured in SFM consistently expressed both sialic acids whereas cells cultured with FBS had varying proportions that alternated passage by passage. To confirm the biological significance of these differences, 50% tissue culture infectious dose experiments were performed at two successive passage points. Serial dilutions were made of one swine origin IAV and one avian origin IAV and each dilution was inoculated into 8 wells of three 96 well tissue culture plates per media group. The swine IAV grew to similar titers in both culture mediums, while the avian IAV grew to significantly (p=.014 for trial 1 and p=.003 for trial 2) higher titers in cells maintained in SFM. The cells maintained in SFM were shown to be expressing more α-2,6-linked sialic acids while the cells maintained with FBS were expressing mostly α-2,3-linked sialic acids. The results indicate that culture media can influence the sialic acid expression of MDCK cells and this can alter the efficiency of IAV isolation.

**Keywords:** MDCK, cell culture, flow cytometry, influenza