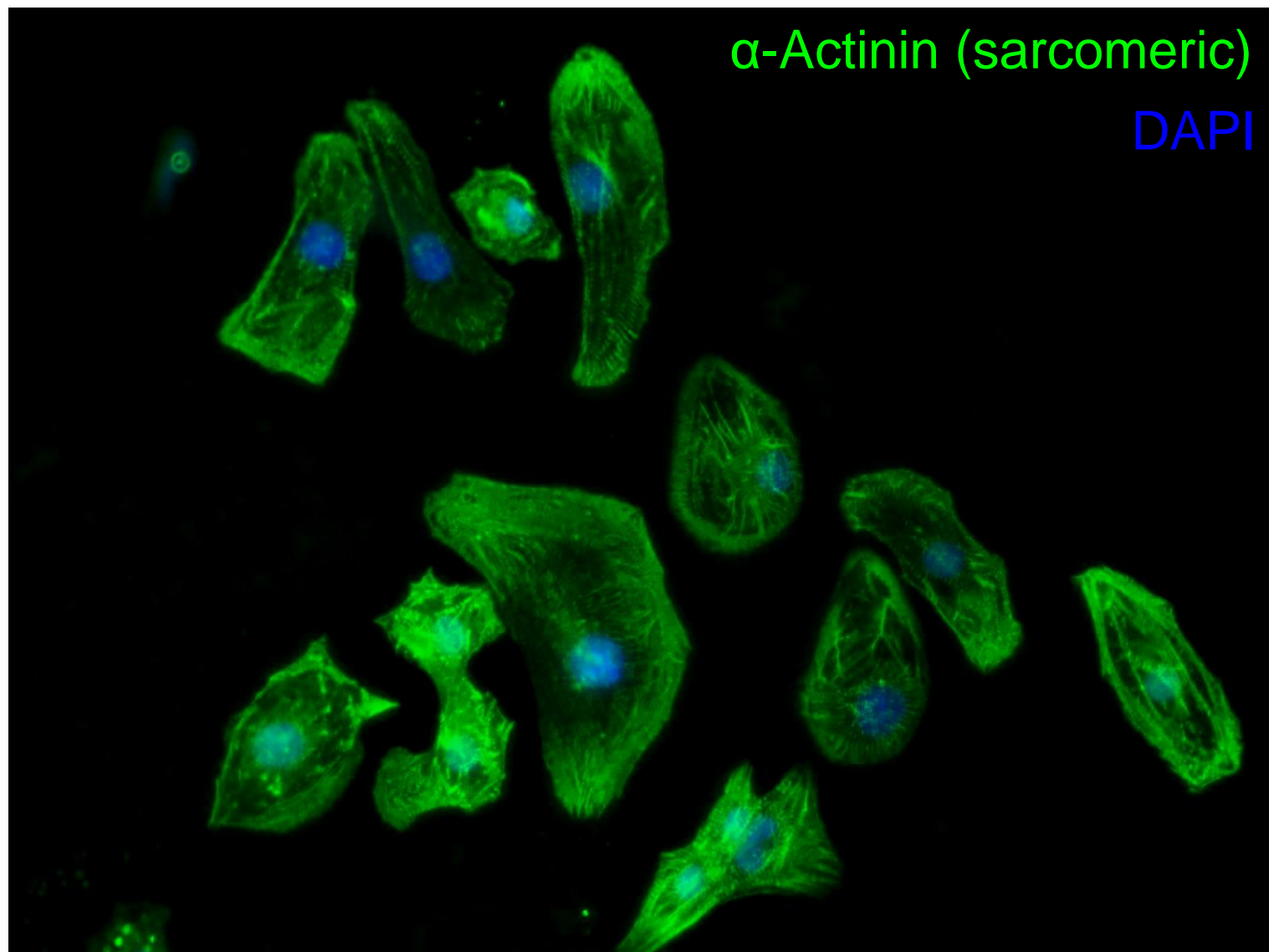
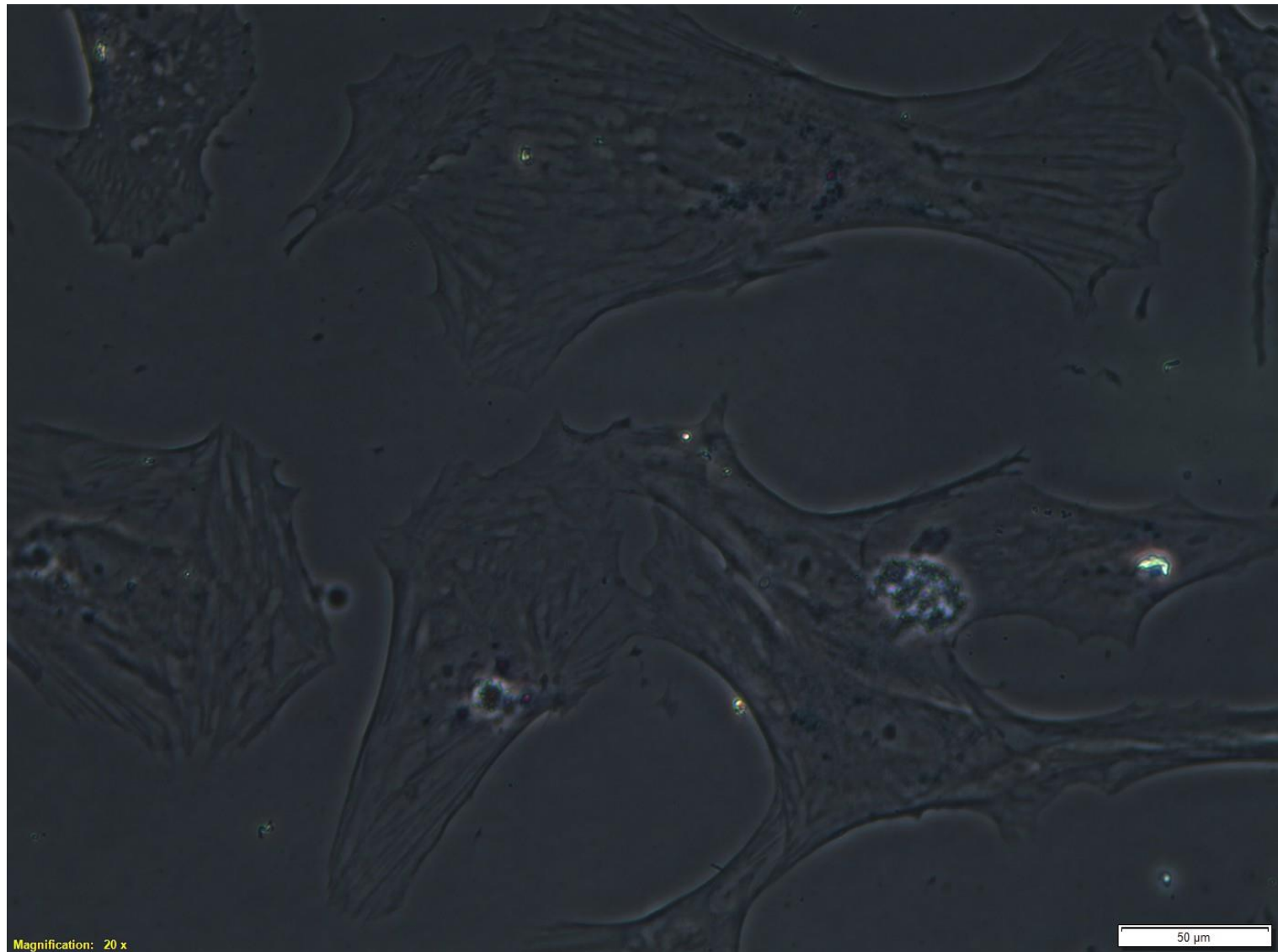
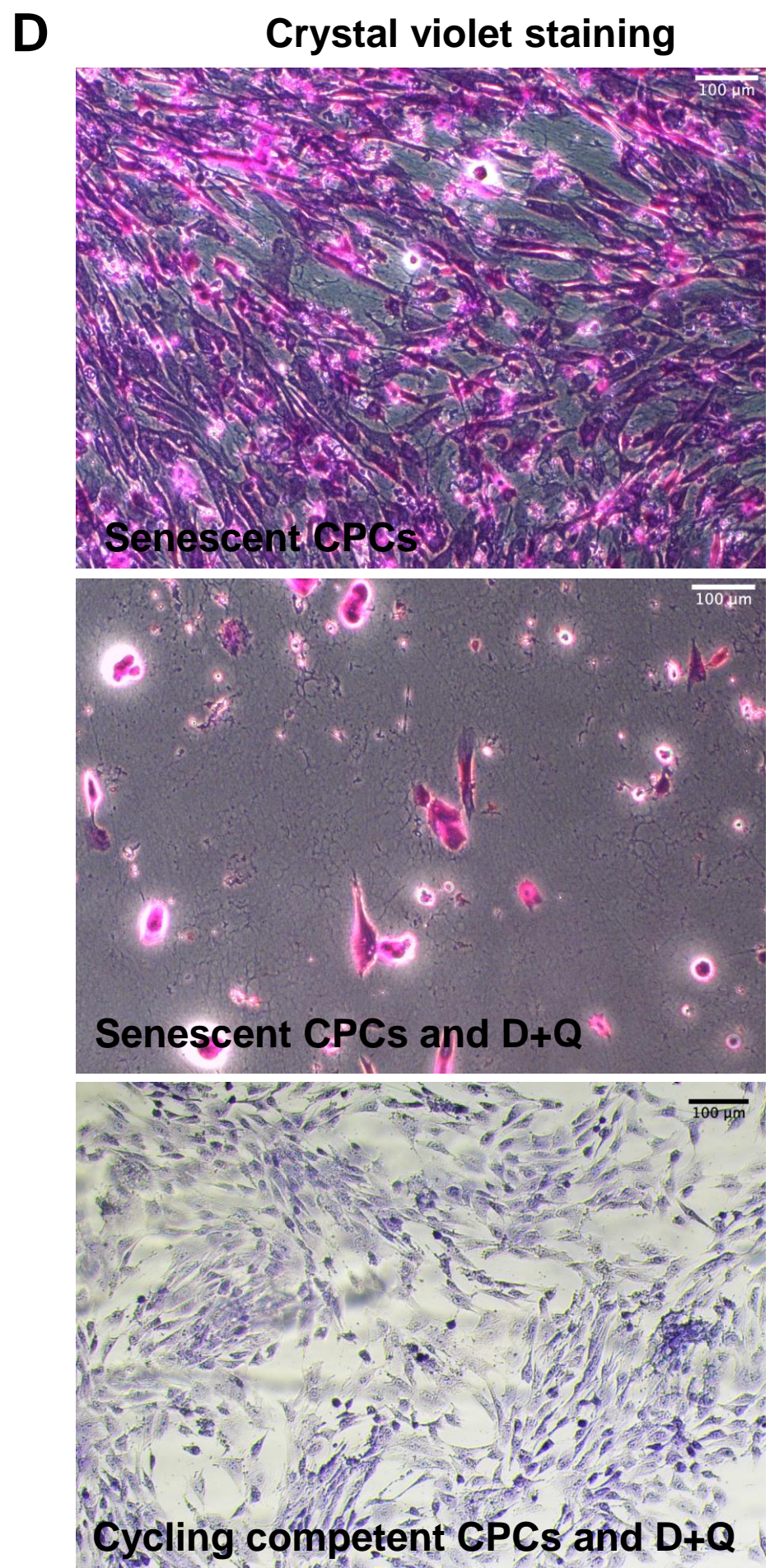
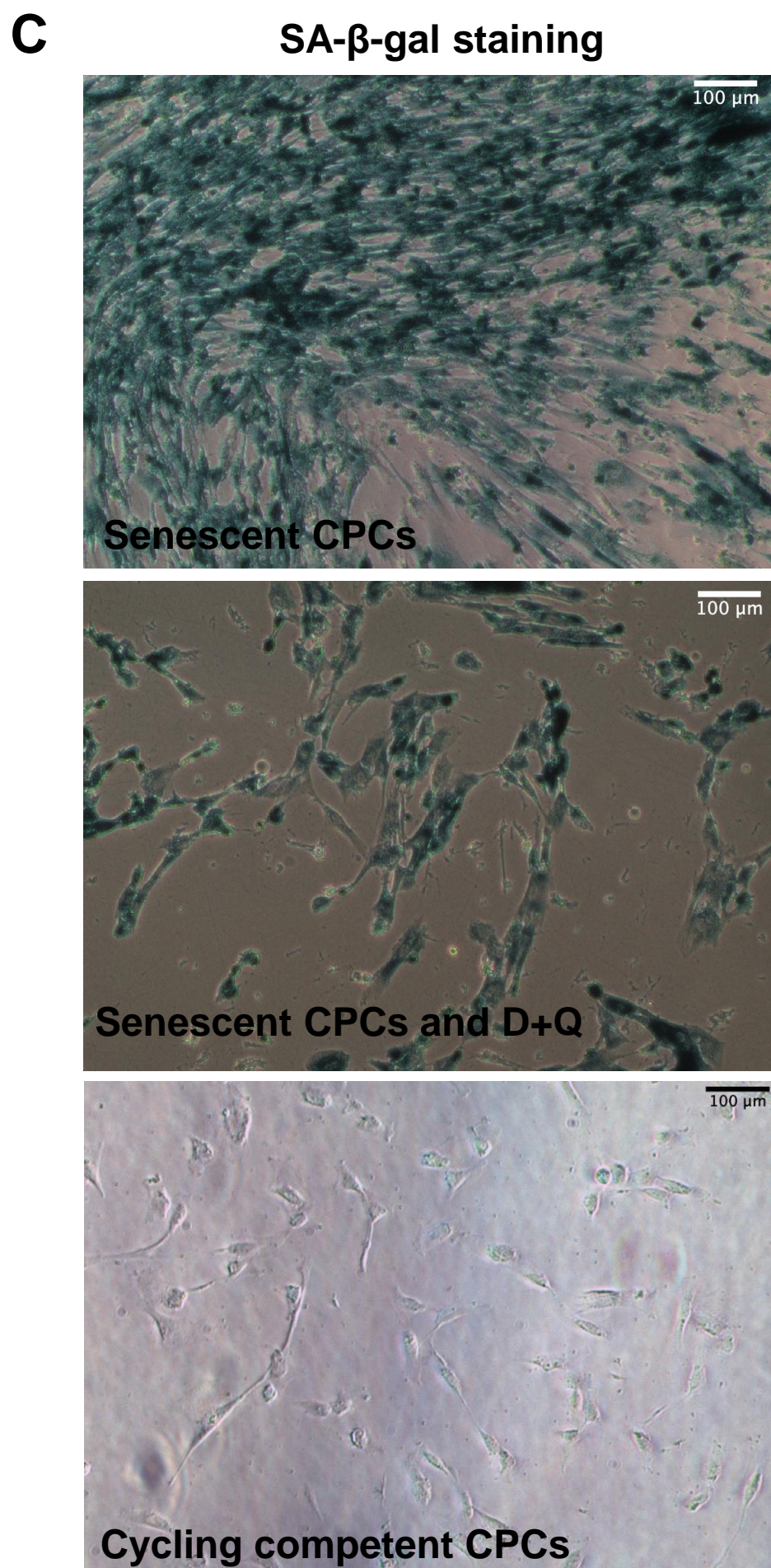
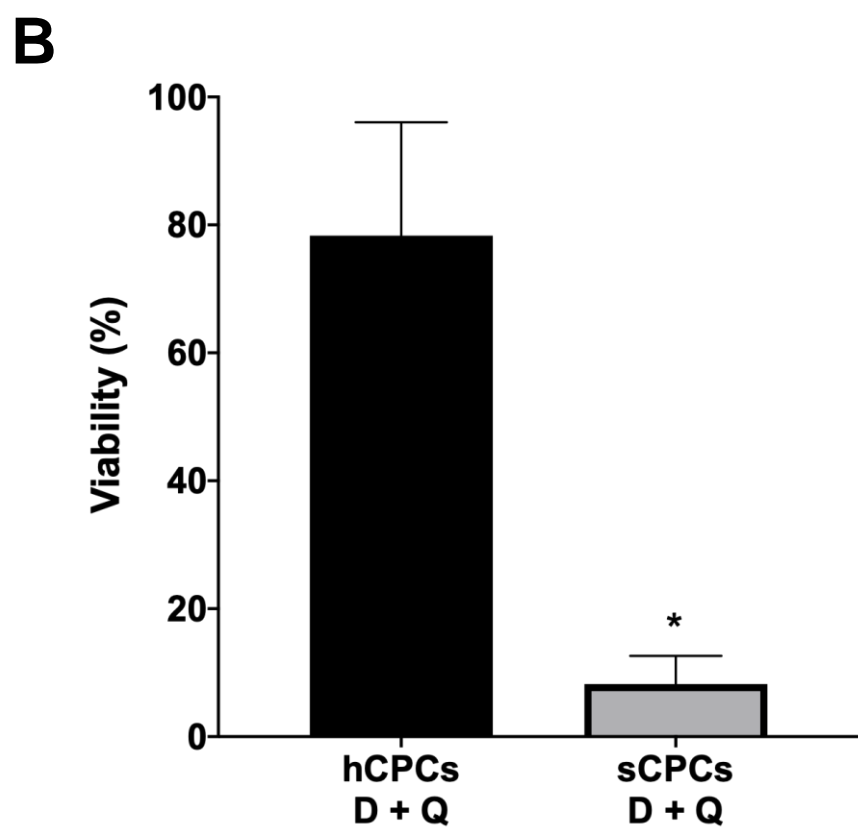
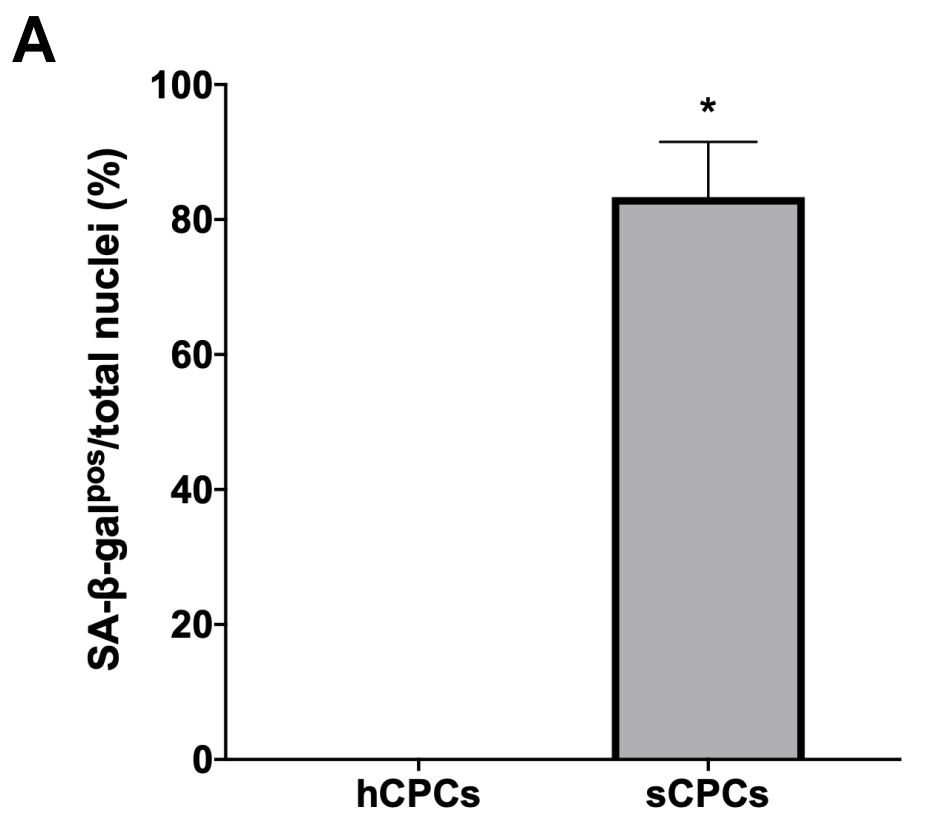
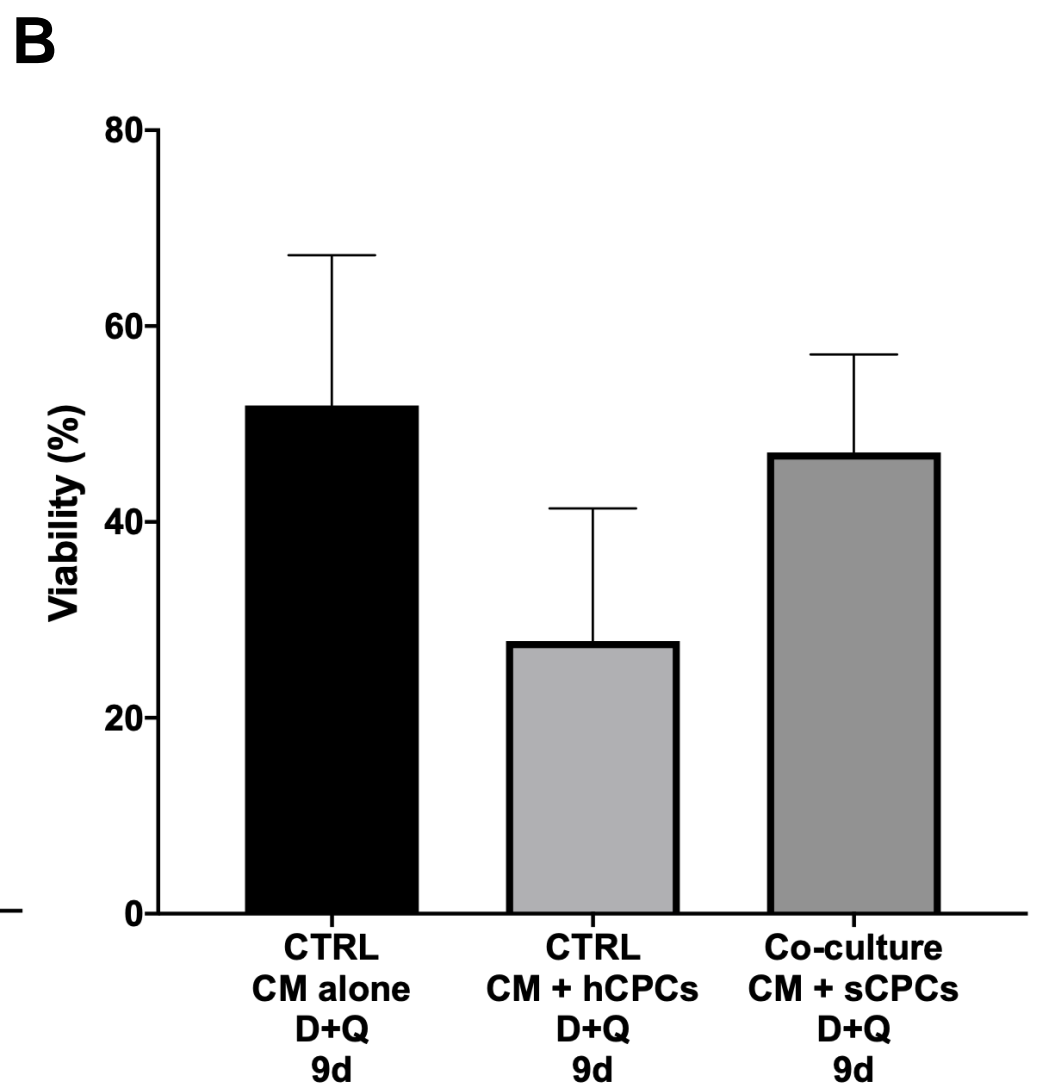
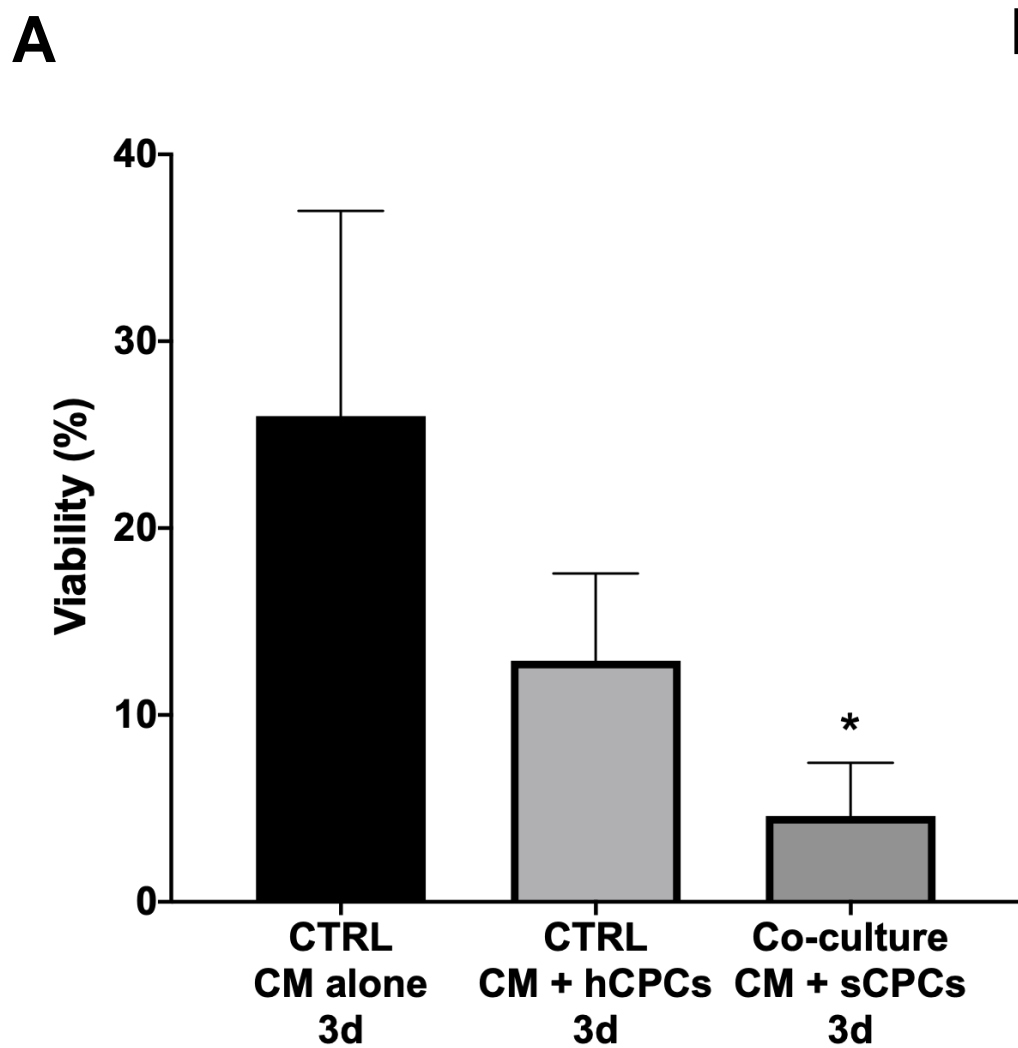


A**B**

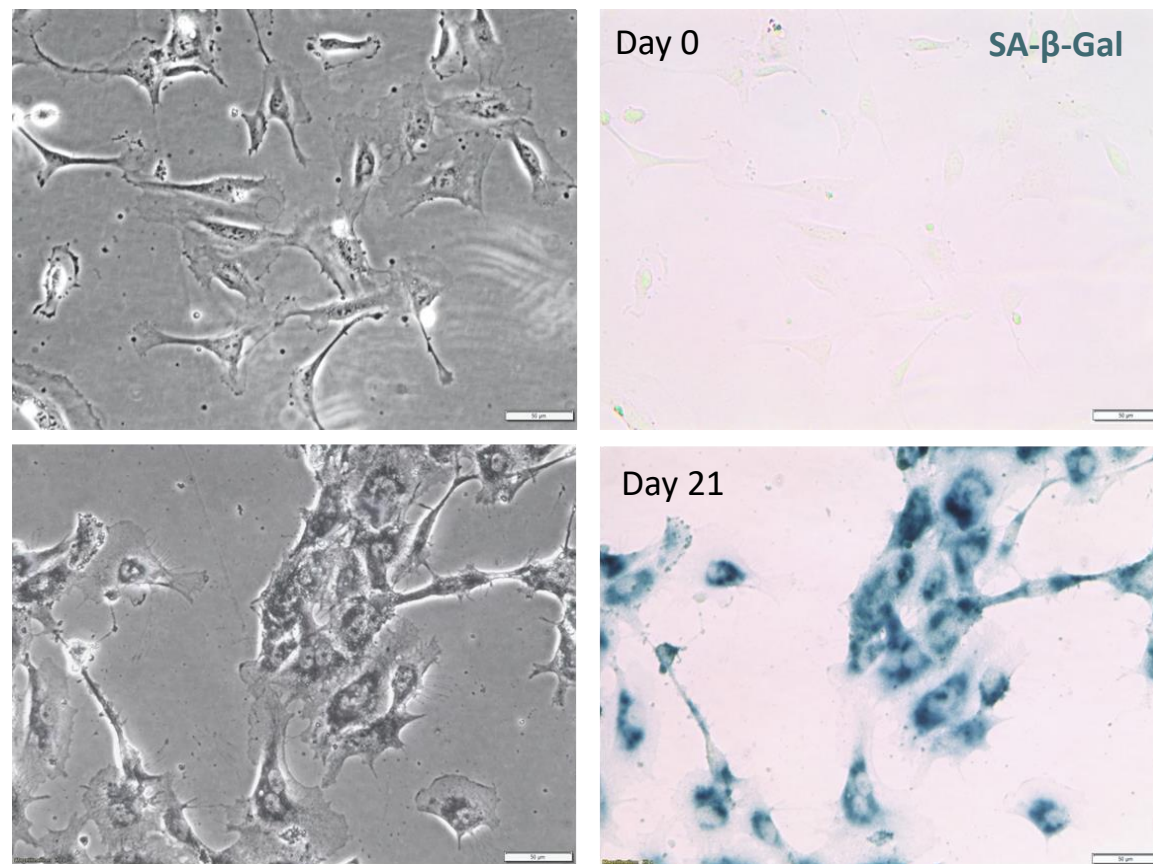
Supplementary Figure 1. Characterisation of iPSC-CMs. A. iPSC-CMs were verified by immunofluorescence staining for Anti- α -Actinin (Sarcomeric), Mouse monoclonal (Sigma, A7732), green. Nuclei counterstained with DAPI (blue). B. Brightfield image of iPSC-CMs. Scale bar = 50 μ m. Also see uploaded video file of beating iPSC-CMs.



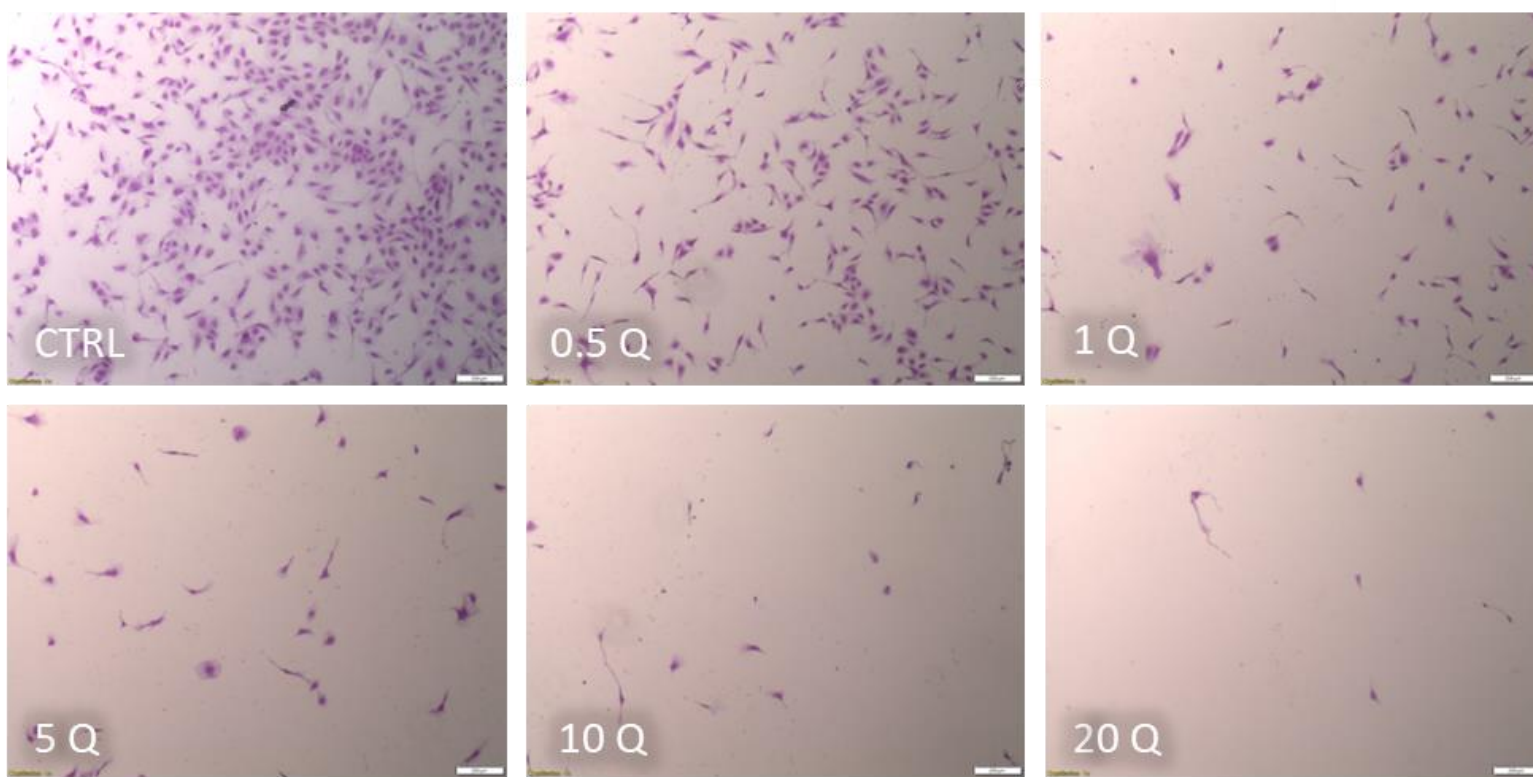
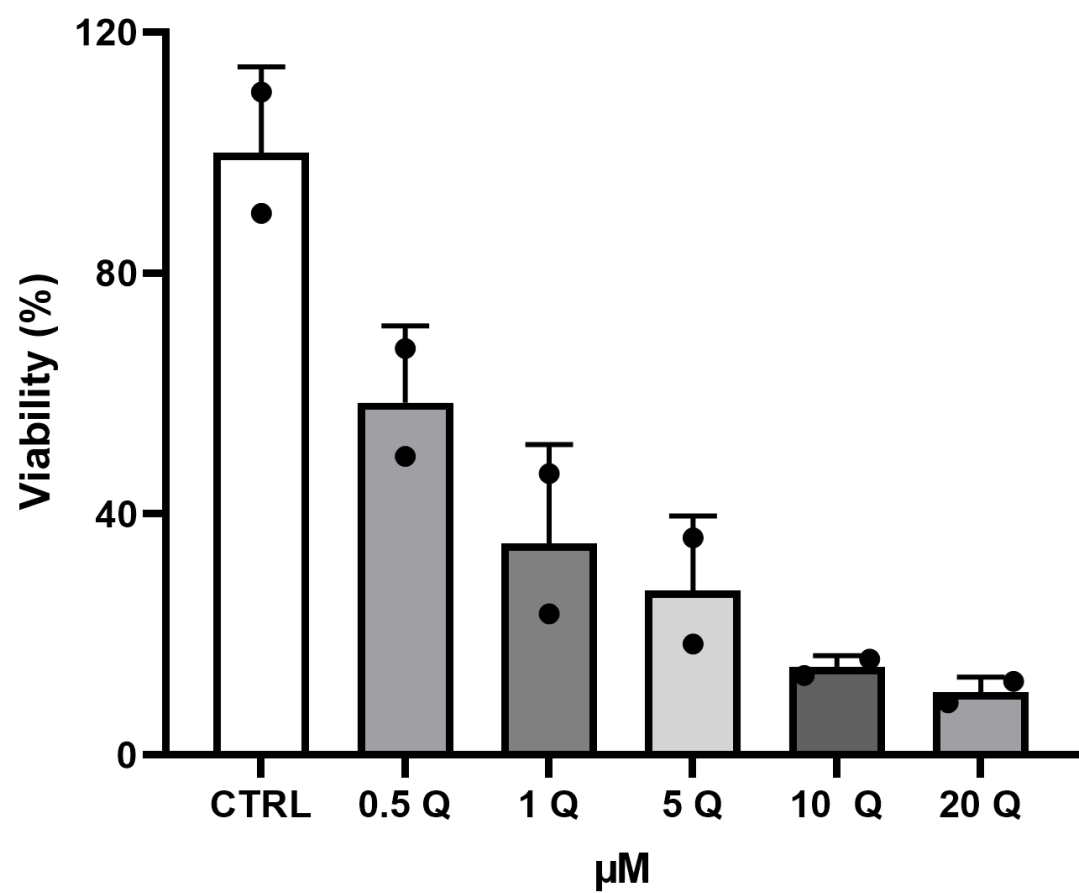
Supplementary Figure 2. Doxorubicin induces CPCs to senescence and D+Q targets senCPCs. **A.** SA-β-gal quantification of non dox-treated healthy, cycling competent CPCs (hCPCs) and dox-treated senCPCs (sCPCs). **B.** Crystal violet (viability) quantification of hCPCs and dox-induced sCPCs treated with D+Q. * $p < 0.0001$. **C.** Representative SA-β-gal staining of senescent CPCs, senescent CPCs and D+Q and cycling competent, healthy CPCs. **D.** Representative images for crystal violet staining of senescent CPCs, senescent CPCs and D+Q and cycling competent, healthy CPCs and D+Q. Data is Mean \pm SD; $n=3$.



Supplementary Figure 3. Co-culture of adult rat ventricular cardiomyocytes with senCPCs or healthy, cycling competent CPCs. A. Co-culture of adult ventricular rat cardiomyocytes with senCPCs (CM + sCPCs) led to decreased number of crystal violet stained cardiomyocytes, compared to cardiomyocytes co-cultured with healthy, cycling competent CPCs (CTRL CM + hCPCs). Data are Mean \pm SD; n=2. *p=0.007 vs. co-culture CM+hCPCs. **B.** D+Q senolytic treatment of co-cultures of adult ventricular rat cardiomyocytes with senCPCs (CM + sCPCs D+Q), healthy, cycling competent CPCs (CTRL CM + hCPCs D+Q) or cardiomyocyte alone (CTRL CM alone D+Q) showed no differences in crystal violet stained cardiomyocytes between groups. Data are Mean \pm SD; n=2.



Supplementary Figure 4. 24 hours of doxorubicin induced HUVECs into a senescent state 21 days later. SA-β-gal activity in HUVECs before (day 0) and 21 days after doxorubicin treatment. Representative micrograph images of HUVECs stained in enzymatic SA-β-gal assay (right) and in phase contrast (left). Scale bar = 50μm



Supplementary Figure 5. Treatment with senolytics, D+Q, cleared senescent HUVECs. Dox-induced senescent HUVEC viability when treated with 0.5 μM dasatinib (D) and varying concentrations of quercetin (0.5 - 20 μM ; Q). Data are Mean \pm SD, $n=2$. Representative micrograph images of HUVECs stained with crystal violet. Scale bar = 200 μm