Title: Temperature Preference of Drosophila S2 Embryonic Stem Cells
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S2 cell culture research is important because 75% of fruit fly genes code for similar genes in humans. This provides an avenue for researchers to perform genetic studies to understand the structure and function of these shared genes. For instance, genetic studies in S2 cells have helped researchers understand the genetic basis of human diseases like cancer. In 1972, Imogene Schneider pioneered a process for culturing embryonic Drosophila stem cells and isolated a single line of S2 embryonic stem cells that is continuously used by researchers to this day. Due to the importance of S2 cells, we seek to improve upon and develop a S2 cell culture protocol to continuously culture cells aseptically for experiments. Initially, we set out to replicate the S2 cell culture technique developed by Schneider using a standard protocol from Thermo Fischer. We grew four S2 cultures from frozen S2 stocks and expected all four cultures to grow well but discovered only one of the four cultures grew well. The single successful culture was used to create six subcultures, three were grown at 28?C and three were grown at 37?. We found the S2 cells grew much better at 28?C than at 37?C. From our findings, we hope to develop a stronger S2 cell culture protocol to continuously produce cell cultures aseptically for experiments. This will enable us to perform other experiments like developing a semi-automated method for counting cells from photomicrographs, genetically modifying cells to have new traits, and knocking down gene expression using RNAi.

References

Boutros, Michael; Kiger, Amy A.; Armknecht, Susan; Kerr, Kim; Hild, Marc; Koch, Britta; Hass, Stefan A.; Consotium, Heidelberg Fly ArrayParo, Renato; Perrimon, Normert. 2004. Genome- Wide RNAi Analysis of Growth and Viability in Drosophila Cells. Science. VOL 303; 832-835.

Johansen, Hanne; Straten, Ariane van der; Sweet, Ray; Otto, Edward; Maroni, Gustavo; Rosenber, Martin. 1989. Regulated expression at high copy number allows production of a growth-inhibitory oncogene product in Drosophila Schneider cells. Genes & Development. 3:822-889.

Schneider, Imogene. 1972. Cell lines derived from late embryonic stages of Drosophila melanogaster, J. Embrol exp. Morph. Vol 27,2: 353-365.

Thermo Fisher Scientific Inc. Drosophila Schneider 2(S2) Cells User Guide. 2018. 1-19.