Within the last decade, the offline rendering branch of computer graphics has moved towards the concept of physically-based rendering by using the path tracing algorithm. One such physically-based effect is fluorescence, where light is absorbed at one wavelength and re-emitted at another. However, to properly capture this effect, one has to utilize spectral path tracing, as opposed to colour-based path tracing. Spectral path tracing by itself suffers from colour noise, which can be reduced by utilizing the so-called Hero Wavelength Spectral Sampling (HWSS). The inclusion of wavelength shifting induced by fluorescence requires modifications to the base path tracing algorithm that HWSS wasn't designed for. This thesis provides the overview of path tracing, the current state-of-art for inclusion of fluorescence in a rendering system, along with relevant technical details, the overview of HWSS itself as well as mathematical formulation that enables the combination of fluorescence and HWSS. Additionally, this thesis also proposes a new approach to rendering fluorescent participating media that properly handles previously overlooked failure cases.