

Web Side Note: Medical Uses of RTD The application of RTD analysis in biomedical engineering is being used at an increasing rate. For example, Professor Bob Langer's* group at MIT used RTD analysis for a novel Taylor-Couette flow device for blood detoxification while Lee et al.† used an RTD analysis to study arterial blood flow in the eye. In this later study, sodium fluorescein was injected into the antecubital vein. The cumulative distribution function $F(t)$ is shown schematically in Figure 16.5.N-1. Figure 16.5.N-2 shows a laser ophthalmoscope image after injection of the sodium fluorescein. The mean residence time can be calculated for each artery to estimate the mean circulation time (ca. 2.85 s). Changes in the retinal blood flow may provide important decision-making information for sickle-cell disease and retinitis pigmentosa.

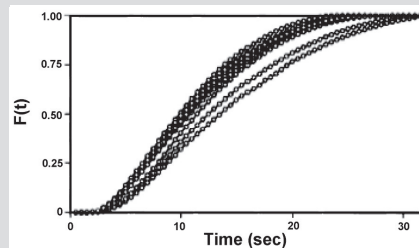


Figure 16.5.N-1 Cumulative RTD function for arterial blood flow in the eye. E. T. Lee, R. G. Rehkopf, J. W. Warnicki, T. Friberg, D. N. Finegold, and E. G. Cape, "A new method for assessment of changes in retinal blood flow." *Med. Eng. Phys.* 19(2), 125 (1997).

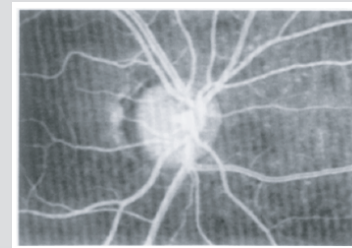


Figure 16.5.N-2 Image of eye after tracer injection. E. T. Lee, R. G. Rehkopf, J. W. Warnicki, T. Friberg, D. N. Finegold, and E. G. Cape, "A new method for assessment of changes in retinal blood flow." *Med. Eng. Phys.* 19(2), 125 (1997).

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† E. T. Lee, R. G. Rehkopf, J. W. Warnicki, T. Friberg, D. N. Finegold, and E. G. Cape, "A new method for assessment of changes in retinal blood flow." *Med. Eng. Phys.* 19(2), 125 (1997).