Sim Pack 2:

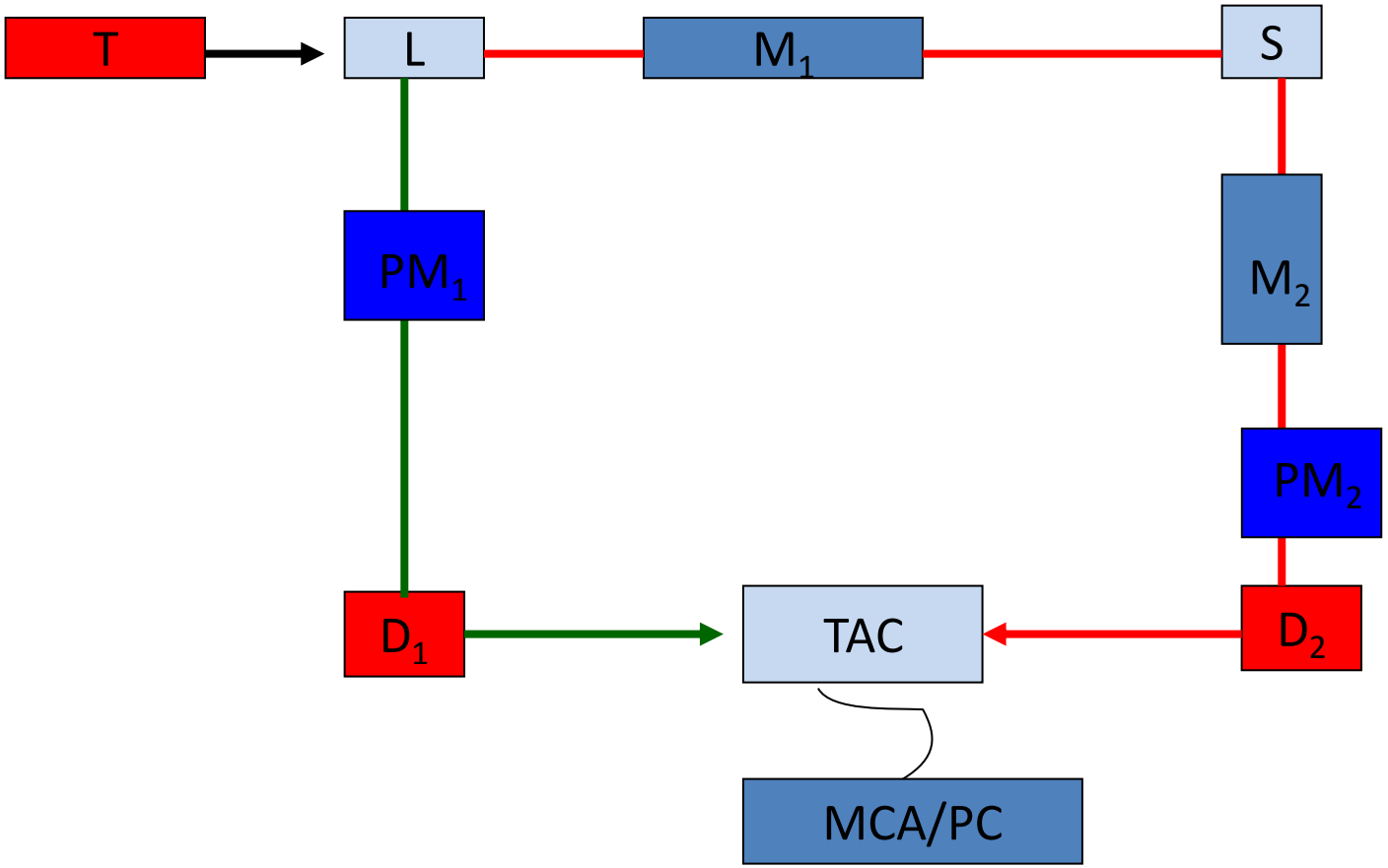
Single Photon Counting

Version 1.0

Learning Outcomes:

After reading these notes you will learn about the following terms

- **Fluorescence excited state lifetime**
- **Single exponential decay**
- **Single photon counting**
- **Reconvolution**



Schematic layout of a time-correlated single photon counter:

T = trigger control; L= nanosecond source; M= monochromator; s = sample;
PM = photomultiplier; D = constant fraction discriminator;
TAC = time-to-amplitude converter; MCA = multichannel analyser (PC)

Difference between "start" (green) and "stop" (red) signal classed as an "event" & is stored in the MCA

For long-lived species (τ >> width of excitation pulse) showing first order kinetics, τ would be obtained from the slope of log F *vs.* t, analysing the decay data in a region "free" from the perturbing influences of the excitation pulse.

Lifetime Determination