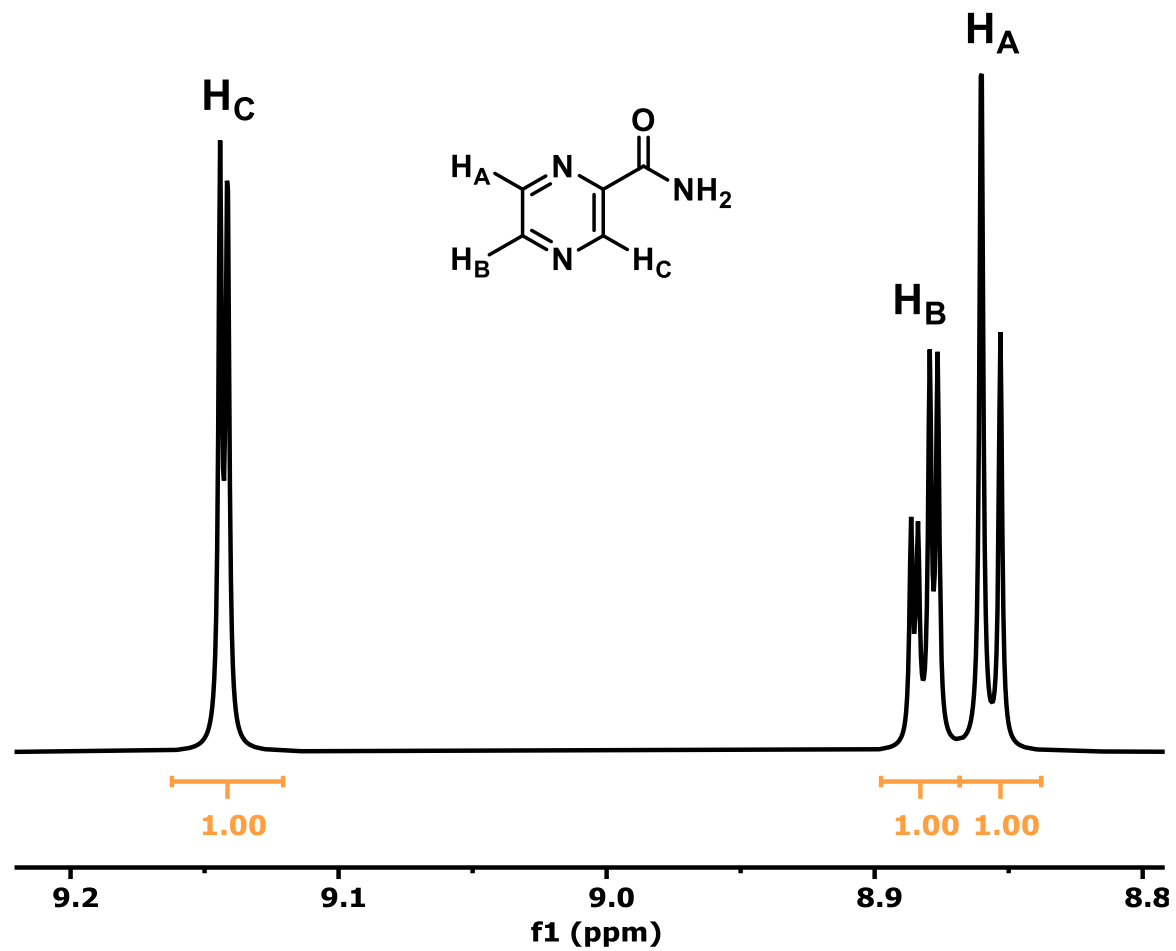
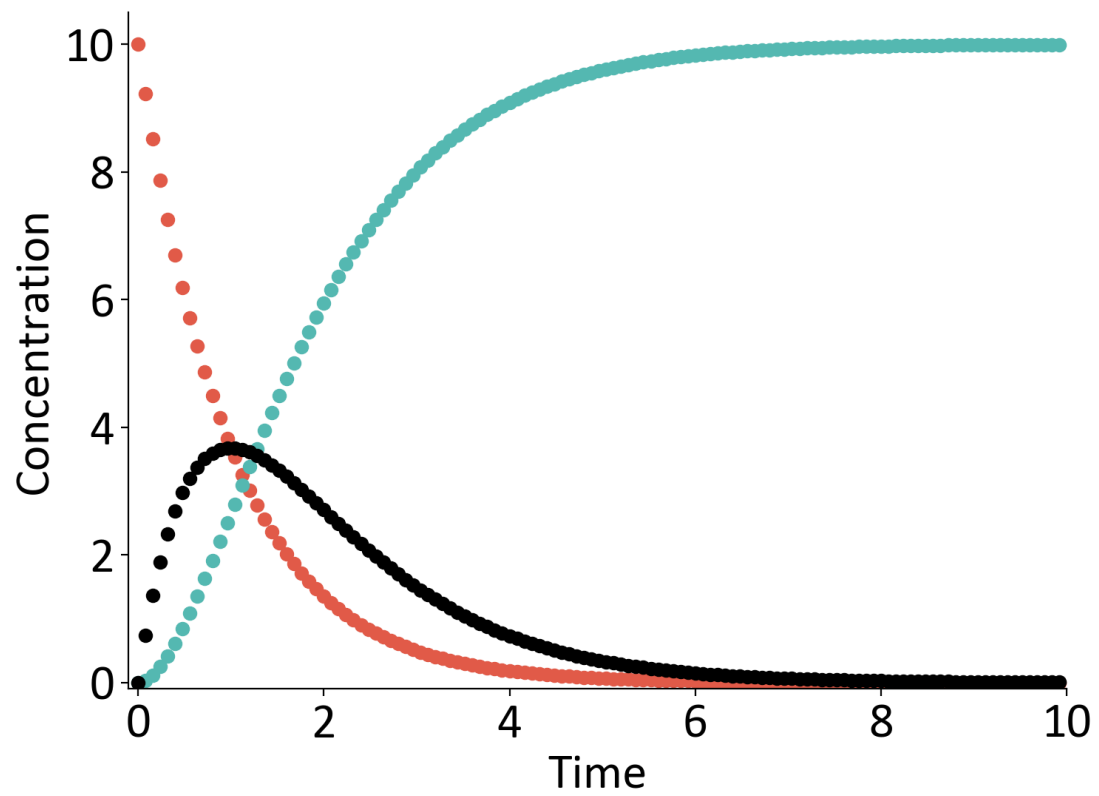




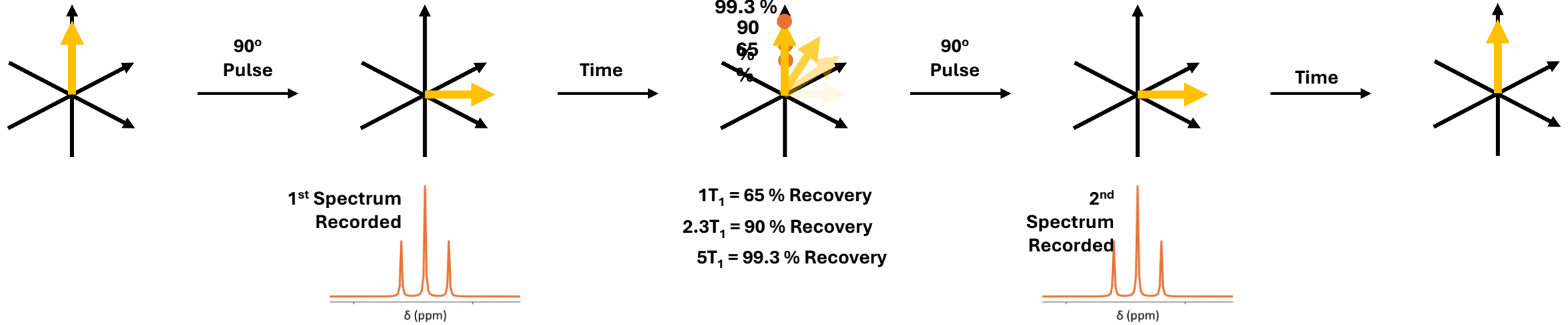
THE UNIVERSITY  
*of* EDINBURGH

# What is $T_1$ and Why Does it Matter?

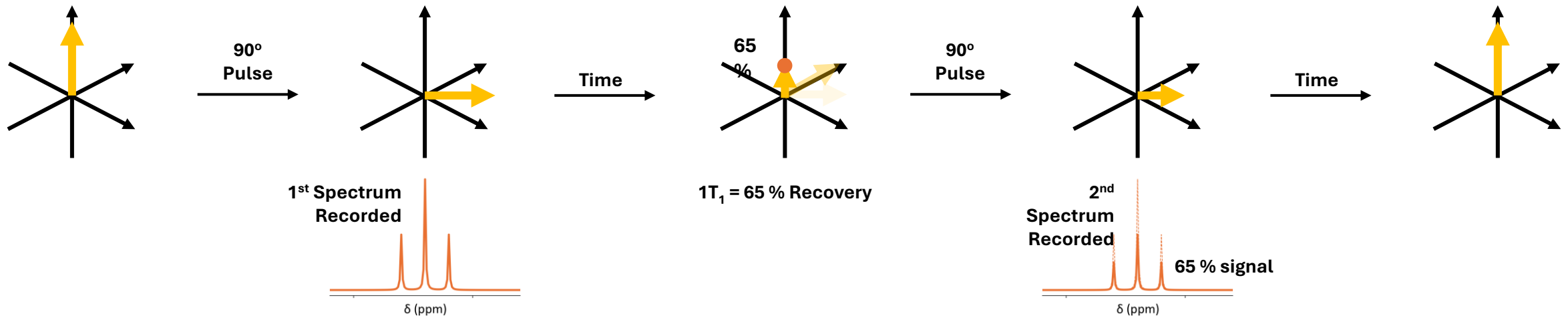
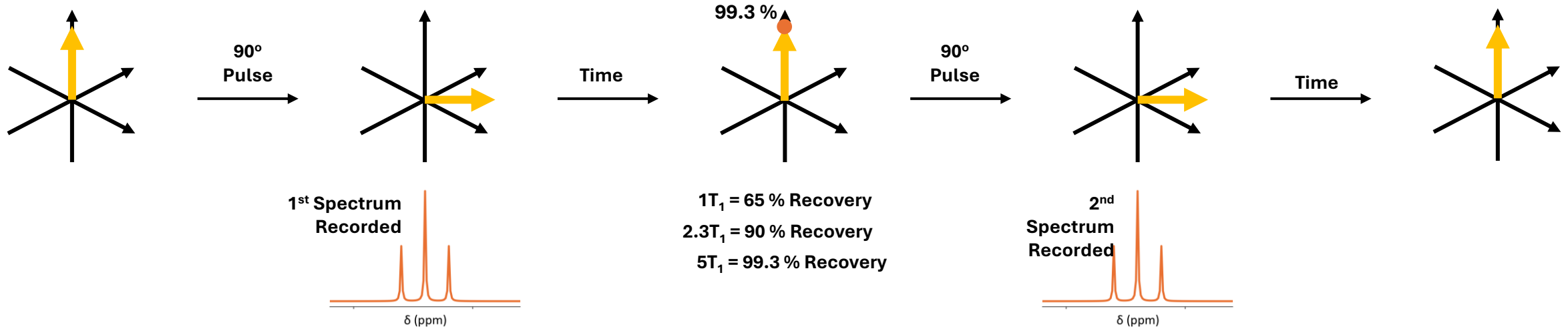
Annabel Flook



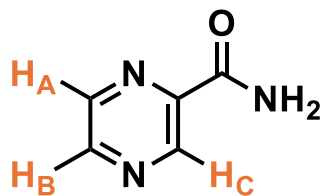
# Longitudinal Relaxation Time ( $T_1$ )



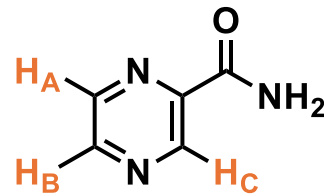
# Longitudinal Relaxation Time ( $T_1$ )



# Longitudinal Relaxation Time ( $T_1$ ) – Some Examples



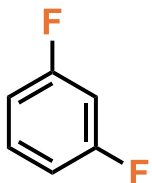
Degassed



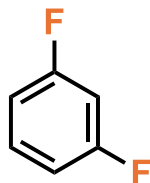
Each nuclear environment *can* have a different  $T_1$

Changing the chemical environment can impact  $T_1$

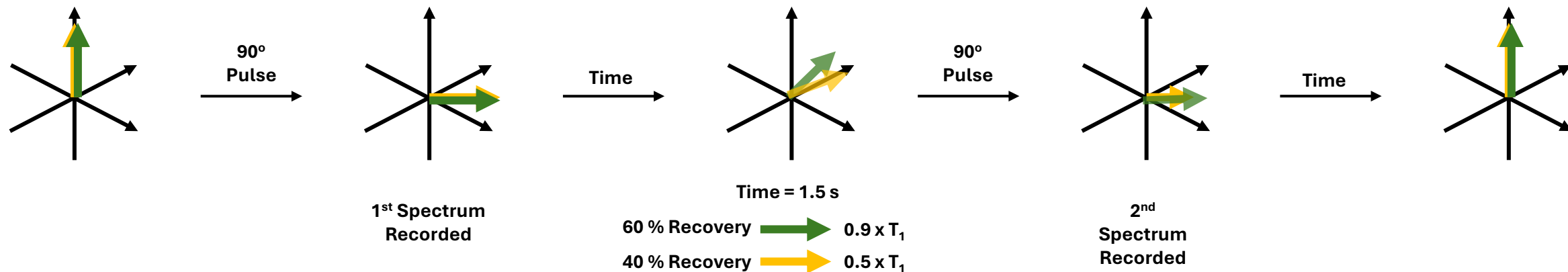
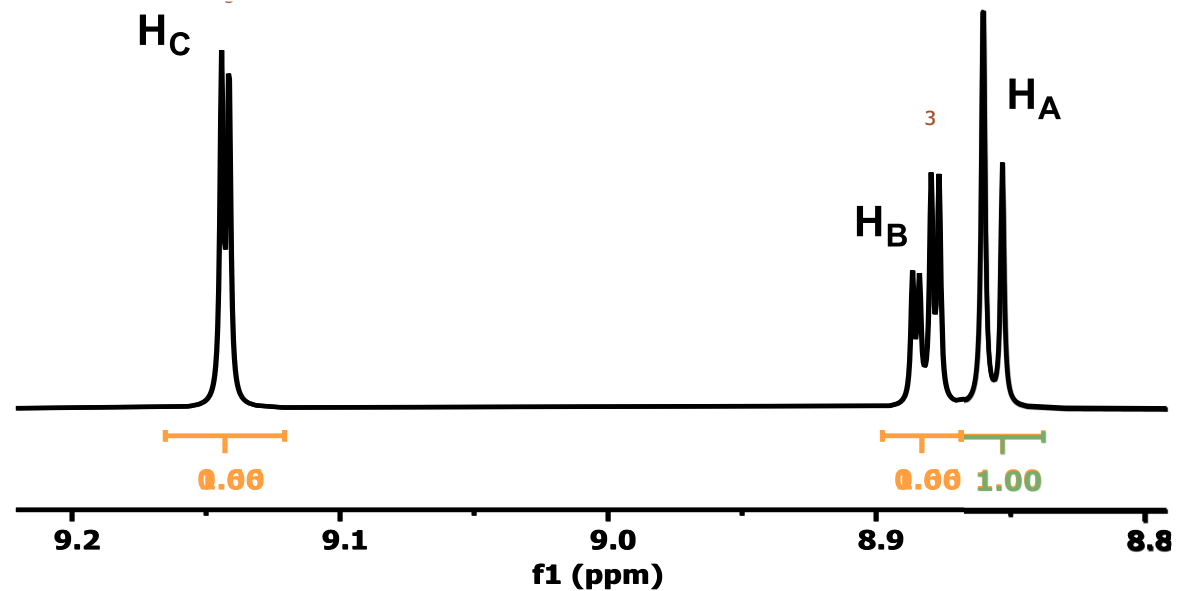
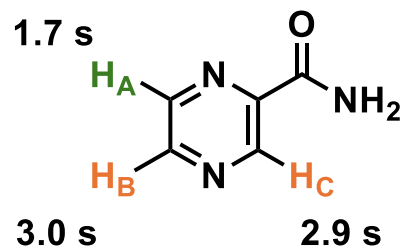
27 °C



50 °C



Changing temperature also impacts  $T_1$



# Longitudinal Relaxation Time ( $T_1$ ) – What to Do?



## $T_1$ Measurements (1, 2)

- Inversion Recovery
- Saturation Recovery
- Progressive Saturation
- FLIPS



## Number of Scans = 1

Spectrum is unaffected by  $T_1$

- Only for abundant nuclei
- Not for reaction monitoring