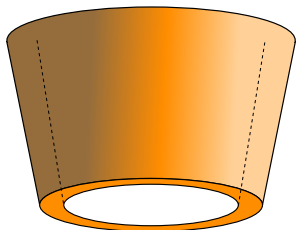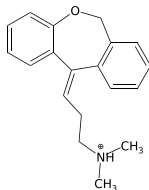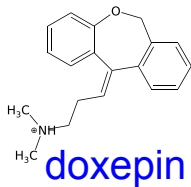# Revealing ligand-receptor interaction NMR titration
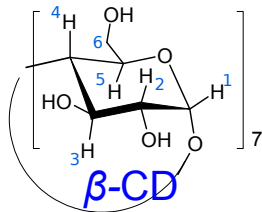
Martin Novák, Jan Novotný

May 4, 2016

Introduction of reacting partners
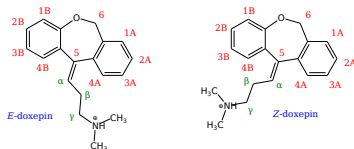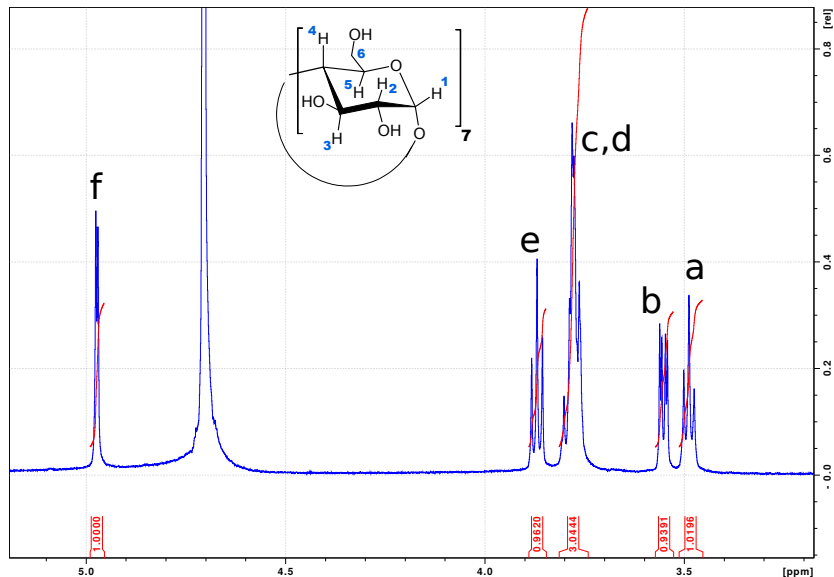

doxepin ?

β-CD

# Recommended procedure

1. Assignment of free receptor - β-cyclodextrine (1D ^{1}H, DQF-COSY)
2. Assignment of free ligand - doxepin (1D ^{1}H, DQF-COSY, NOESY)
   - Identification of proton resonances of ring A and B
   - Determination of major and minor conformation of doxepin
3. 1D NMR titration - rearrangement of β-cyclodextrine resonaces upon interaction $\Rightarrow$ identification of inner protons
4. 1D NMR titration - rearrangement of doxepin resonaces upon complexation $\Rightarrow$ estimation of binding mode
5. ROESY spectrum of complex: ROE intermolecular contacts
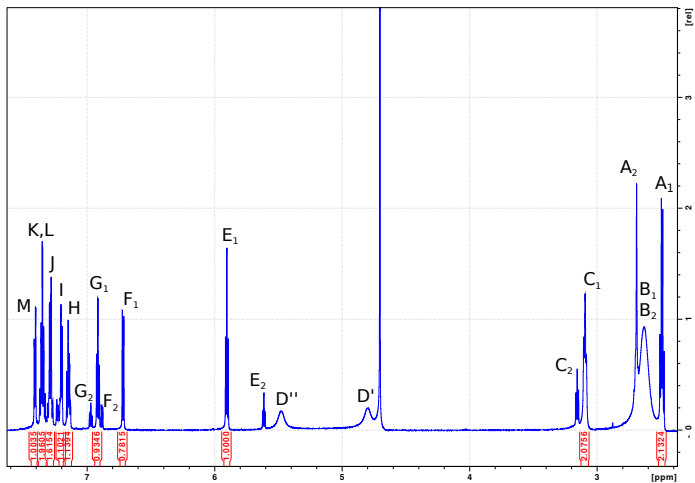6. Fitting the titration isotherm

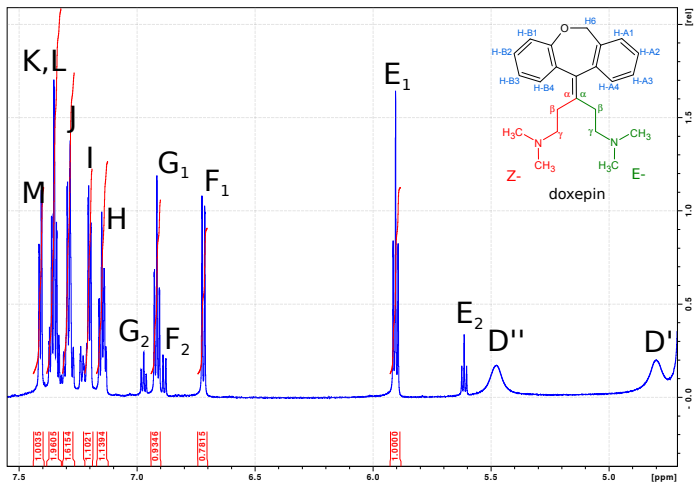# 1D ^{1}H of β-cyclodextrine in D$_2$O

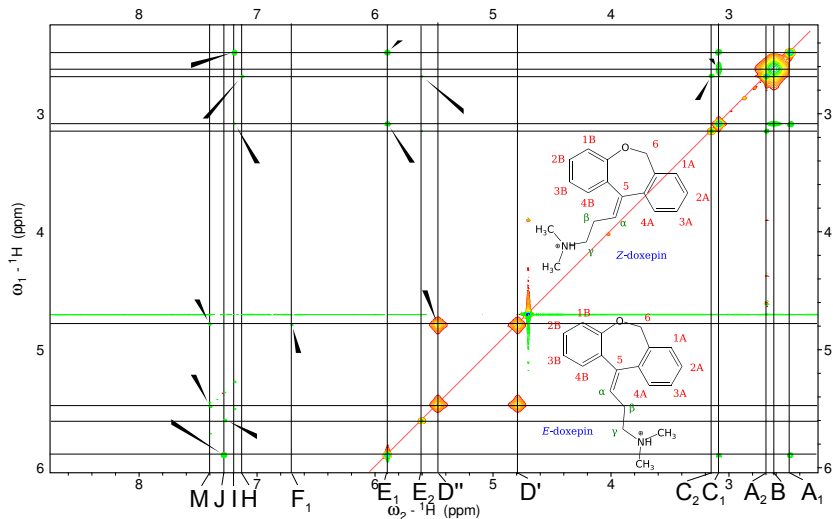# DQF-COSY of β-cyclodextrine in D_2O
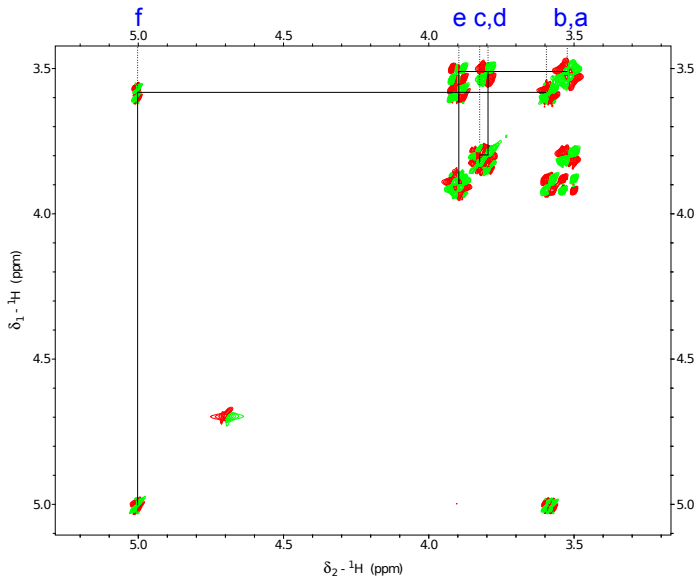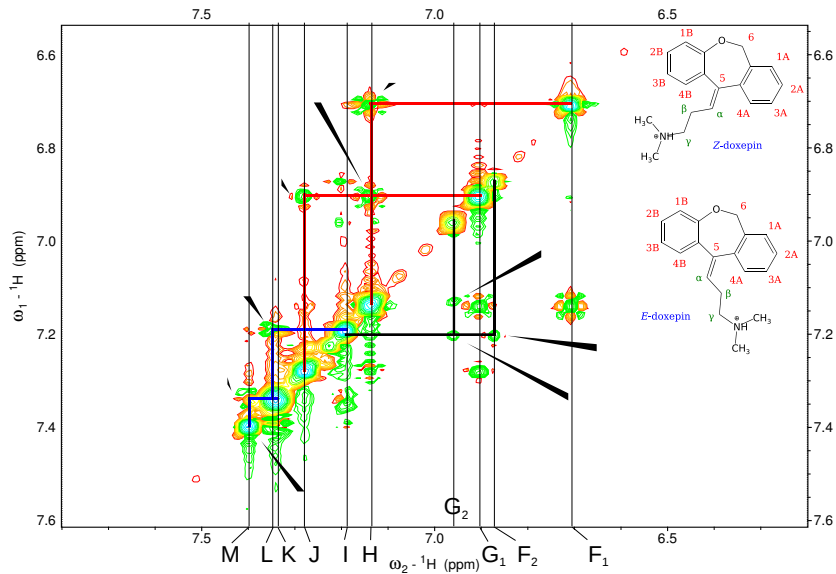
1D ^{1}H of doxepin in D_2O
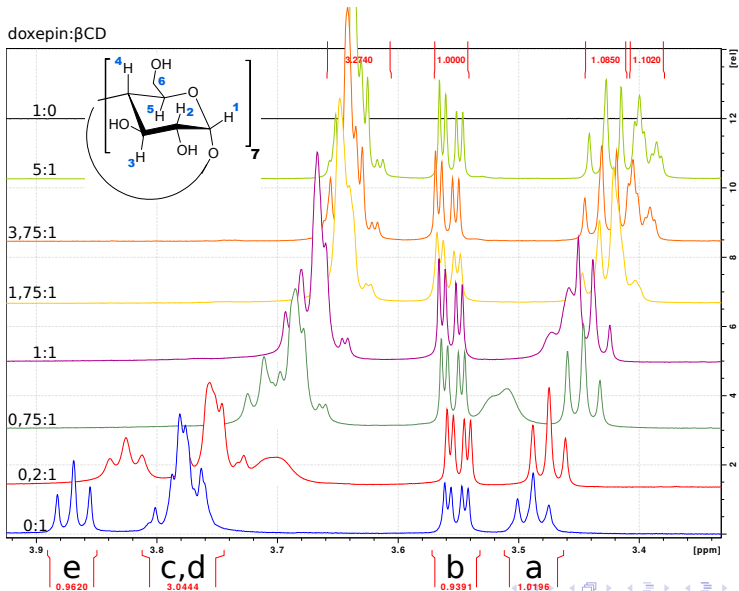
1D ^{1}H of doxepin in D$_2$O

NOESY 700ms of doxepin in D₂O

NOESY 700ms of doxepin in D$_2$O

1D ^{1}H NMR titration: β-cyclodextrine

1D ^{1}H NMR titration: doxepin
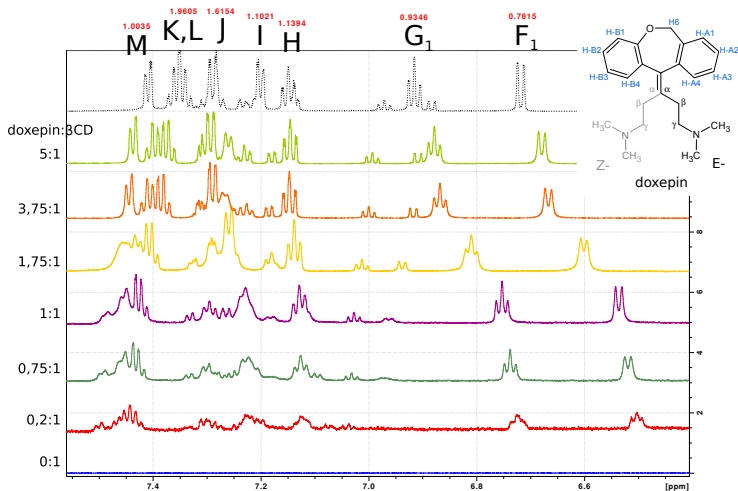
Find the most perturbed resonances and estimate the time regime of interaction:

ROESY 300ms - doxepin:β-cyclodextrine$=$5:1