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In vivo magnetic resonance imaging and spectroscopy of Alzheimer_s disease in transgenic mice

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Appendix

L-COSY pulse program

This is the L-COSY pulse program implemented on the Bruker BioSpin 9.4 and 17.6T MR spectrometers used for the research presented in this thesis.

; lcosy.ppg -

```
#include <Avance.incl>
```

```
#include <DBX.include>
```

```
#include <PrepModulesHead.mod>
```

```
define delay de4
```

```
"de4=0.00002-de+depa"
```

```
define delay decodur
```

```
"decodur=0.00002-de+depa"
```

```
#include <decoacq.mod>
```

```
define loopcounter lds={$NDummyScans}
```

```
preset off
```

```
#include <MEDSPEC.include>
```

```
;-----D/P-----GRAD-----RF/ACQ-----
```

```
start, 4u
```

```
av, d1 fq8b:f1
```

```
;-----Triggered data -----
```

```
#include <TriggerPerSlice.mod>
```

```
;-----noe module-----
```

```
#include "noe.mod"
```

```
;-----ws & ovs module-----
```

```
#include "WsOvs.mod"
```

```
;-----localisation module-----
```

```
1u ; reset:f1
```

```
d4 grad{ (t1) | (0.0) | (0.0) } fq1:f1
```

```
d6 gatepulse 1
```

```
(p1:sp1 ph1):f1
```

```
d6
```

```
d7 groff
```

```
goto 10
```

```
nav, 1u
```

```
if ( PVM_ppgFlag4 == Yes) { ; Retro frequency lock
```

```

d4      grad{ (t1) | (0.0) | (0.0) }      fq1:f1
d6                                     gatepulse 1
(p1:sp0 ph1):f1
d6
d7      groff
}
10 d8      grad{ (t4) | (t6) | (t7) }
d4      grad{ (0.0) | (t2) | (0.0) }      fq1:f1
d6                                     gatepulse 1
(p2:sp2 ph2):f1
d6
d8      grad{ (t5) | (t6) | (t7) }
d9      groff

d0 ; COSY time evolution

;pulse adjustments:
if ( PVM_ppgFlag3 == Yes ) {
d12     grad{ (t11) | (t12) | (t13) }
d4      groff
}
d10     grad{ (t8) | (t9) | (t10) }      fq1:f1
d4      grad{ (0.0) | (0.0) | (t3) }
d6                                     gatepulse 1
(p3:sp3 ph3):f1
d6
d10     grad{ (t8) | (t9) | (t10) }
d11     groff

;-----data acquisition-----
;pulse adjustments:
if ( PVM_ppgFlag3 == Yes )
{
d4      grad{ (t14) | (t15) | (t16) }
de4                                     REC_ENABLE
                                     ADC_INIT_B(ph31, ph30)
aqq                                         ADC_START
}
else
{
subr decoup(decodur,ph31,ph30)
}
3m groff
if(OPT_RFLOnOff == On)
{
1m reload B0
}
else
{
1m
}
1m                                     ADC_END

```

```

;-----navigator loop -----
    lo to nav times l1

;-----dummy scans -----
    "lds = lds - 1"
    if "lds>=0" goto start

;-----averaging & phase cycling-----
    if ( ACQ_scan_type == Scan_Experiment ) {
        1u                                ipp1
        1u                                ipp2
        1u                                ipp3
        1u                                ipp31
    }
    lo to start times NA
    1u                                    rpp1
    1u                                    rpp2
    1u                                    rpp3
    1u                                    rpp31

    if(ACQ_scan_type != Setup_Experiment)
    {
        1u id0
        1u id1
    }
    lo to start times ACQ_size[1]

    1u
    lo to av times NR
        SETUP_GOTO(av)
exit

ph0 = 0
ph1 = 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
ph2 = 0 0 1 1 0 0 1 1 2 2 3 3 2 2 3 3
ph3 = 0 2 0 2 1 3 1 3 0 2 0 2 1 3 1 3
ph30 = 0
ph31 = 0 0 2 2 2 2 0 0 0 0 2 2 2 2 0 0

```

