**Supporting Table S1. Detection performance in the EAE model:** Ex vivo and in vivo refer to Setup 2 and 3, respectively. Row 2 and 3 show the reference signal level at which a TPR of 90% is reached. Row 4 and 5 show the FDR at signal levels just above the background subtraction threshold and rows 6 and 7 the overall FDR.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Fourier | Denoised | CS $α=2$ | CS $α=3$ | CS $α=4$ | CS $α=5$ |
| $S\_{r}$ at $$TPR=90\%$$ | Ex vivo | $$5.3σ\_{F}$$ | $$6.1σ\_{F}$$ | $$4.1σ\_{F}$$ | $$3.5σ\_{F}$$ | $$3.3σ\_{F}$$ | $$3.1σ\_{F}$$ |
| In vivo | $$5.5σ\_{F}$$ | $$5.9σ\_{F}$$ | $$4.0σ\_{F}$$ | $$3.5σ\_{F}$$ | $$3.2σ\_{F}$$ | $$3.0σ\_{F}$$ |
| Maximal FDR | Ex vivo | 4.8% | 0.4% | 6.0% | 11.5% | 19.0% | 24.1% |
| In vivo | 8.8% | 1.6% | 12.0% | 25.4% | 36.5% | 39.5% |
| Overall FDR | Ex vivo | 1.0% | 0.2% | 3.0% | 8.0% | 13.9% | 17.4% |
| In vivo | 3.1% | 0.5% | 5.5% | 13.2% | 21.3% | 24.3% |